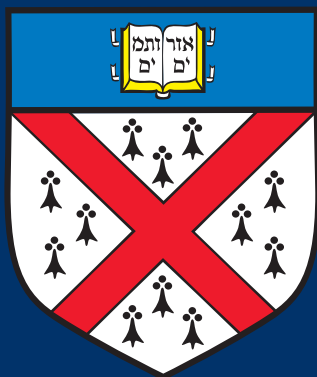


Yale College  
Programs of Study  
*Fall and Spring Terms*

2014–2015



BULLETIN OF YALE UNIVERSITY

*Series 110 Number 9 August 1, 2014*

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MISSION STATEMENT OF YALE COLLEGE The mission of Yale College is to seek exceptionally promising students of all backgrounds from across the nation and around the world and to educate them, through mental discipline and social experience, to develop their intellectual, moral, civic, and creative capacities to the fullest. The aim of this education is the cultivation of citizens with a rich awareness of our heritage to lead and serve in every sphere of human activity.

Yale College  
Programs of Study  
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# KEY TO COURSE LISTINGS

AFAM	Course subjects are listed by three- or four-letter abbreviations in capitals. See the complete list of Subject Abbreviations.
MATH 112a or b	The letters “a” and “b” after a course number denote fall- and spring-term courses, respectively. A course designated “a or b” is the same course given in both terms.
Staff	Multiple course instructors are commonly listed as “Staff.” Refer to Online Course Information ( <a href="http://students.yale.edu/oci">http://students.yale.edu/oci</a> ) for individual section instructors.
Prerequisite: MATH 112	Prerequisites and recommendations are listed at the end of the course description.
L5, HU	Foreign language courses are designated L1 (first term of language study), L2 (second term), L3 (third term), L4 (fourth term), or L5 (beyond the fourth term). Other distributional designations are QR, WR, HU, SC, and SO, representing quantitative reasoning, writing, humanities and arts, science, and social science, respectively. See “Distributional Requirements” under “Requirements for the B.A. or B.S. Degree” ( <a href="http://catalog.yale.edu/ycps/academic-regulations/requirements-for-ba-bs-degree/">http://catalog.yale.edu/ycps/academic-regulations/requirements-for-ba-bs-degree/</a> ) in the Academic Regulations.
½ Course cr	Most courses earn one course credit per term; variations are noted.
RP	A course designated “RP” meets during the reading period. See “Reading Period and Final Examination Period” ( <a href="http://catalog.yale.edu/ycps/academic-regulations/reading-period-final-examination-period/">http://catalog.yale.edu/ycps/academic-regulations/reading-period-final-examination-period/</a> ) in the Academic Regulations.
[ASTR 320]	Courses in brackets are not offered during the current year but are expected to be given in the succeeding academic year.
*HIST 012	A student must obtain the instructor’s permission before taking a course marked by a star. All seminars are starred.
ITAL 310/LITR 183	A course with multiple titles, i.e., with two or more departments in the title line, counts toward the major in each department where it appears.
After CHEM <221>	A course number in angle brackets denotes a course that is not currently listed or bracketed but that has been offered within the past three years.
TR	The abbreviation “TR” denotes a literature course with readings in translation.
English: Pre-1900 Lit	Courses with department-specific designations are applied toward the requirements of certain majors. Descriptions of these requirements are included in program descriptions of the relevant majors.
HIST 130Jb, MCDB 201Lb	A capital J or L following the course number denotes a History departmental seminar or a science laboratory, respectively.
Cognitive Science Courses: ECON 159	Related courses appear in departments other than their own (e.g., ECON 159 might be listed under Cognitive Science). Such courses may count toward the major of the relating department.



# BUILDING ABBREVIATIONS

AKW	Arthur K. Watson Hall	LEPH	Laboratory of Epidemiology and Public Health
BASS	Bass Center for Molecular and Structural Biology	LFOF	Leitner Observatory and Planetarium
BASSLB	Bass Library	LGH	Abby and Mitch Leigh Hall
BCMM	Boyer Center for Molecular Medicine	LOM	Leet Oliver Memorial Hall
BCT	Becton Engineering and Applied Science Center	LORIA	Jeffrey H. Loria Center
BK	Berkeley College	LUCE	Henry R. Luce Hall
BM	Charles W. Bingham Hall	LWR	Lanman-Wright Memorial Hall
BML	Brady Memorial Laboratory	MC	Morse College
BR	Branford College	MEC	Malone Engineering Center
BRBL	Beinecke Rare Book and Manuscript Library	ML	Mason Laboratory
C	Connecticut Hall	OML	Osborn Memorial Laboratories
CC	Calhoun College	PC	Pierson College
CRB	Class of 1954 Chemistry Research Building	PH	Phelps Hall
CSC	Child Study Center	PM	Peabody Museum of Natural History
D	Durfee Hall	PWG	Payne Whitney Gymnasium
DAVIES	Davies Auditorium, Becton Center	RDH	Rudolph Hall
DC	Davenport College	RKZ	Rosenkranz Hall
DL	Dunham Laboratory	SB	Sage Hall
DOW	Dow Hall	SCL	Sterling Chemistry Laboratory
EAL	Electron Accelerator Laboratory	SDQ	Sterling Divinity Quadrangle
EM	Edwin McClellan Hall	SHM	Sterling Hall of Medicine
ES	Ezra Stiles College	SLB	Sterling Law Building
ESC	Class of 1954 Environmental Science Center	SM	Silliman College
EVANS	Edward P. Evans Hall	SMH	Sprague Memorial Hall
F	Farnam Hall	SML	Sterling Memorial Library
GML	Greeley Memorial Laboratory	SPL	Sloane Physics Laboratory
GRN	Holcombe T. Green, Jr., Hall	SSS	Sheffield-Sterling-Strathcona Hall
HGS	Hall of Graduate Studies	STOECK	Stoeckel Hall
JE	Jonathan Edwards College	SY	Saybrook College
JWG	Josiah Willard Gibbs Research Laboratories	TAC	The Anlyan Center
K	Kirtland Hall	TC	Trumbull College
KBT	Kline Biology Tower	TD	Timothy Dwight College
KCL	Kline Chemistry Laboratory	UT	University Theatre
KGL	Kline Geology Laboratory	V	Vanderbilt Hall
KRN	Kroon Hall	W	Welch Hall
L	Lawrance Hall	WL	Wright Laboratory
LC	Linsly-Chittenden Hall	WL-W	Wright Laboratory West
		WLH	William L. Harkness Hall
		WTS	Watson Center
		YCBA	Yale Center for British Art
		YUAG	Yale University Art Gallery

# YALE COLLEGE CALENDAR WITH PERTINENT DEADLINES

This calendar includes a partial summary of deadlines given in the Academic Regulations (p. 32) and in the Yale College online publication *Undergraduate Regulations* (<http://yalecollege.yale.edu/campus-life/undergraduate-regulations>). Unless otherwise specified, references are to sections in the Academic Regulations, and deadlines fall at 5 p.m.

## FALL TERM 2014

- Aug. 20 W Residences open to upperclassmen, 9 a.m.
- Aug. 22 F Residences open to freshmen, 9 a.m.  
Required registration meetings for freshmen.
- Aug. 26 T Required registration meetings for upperclassmen.
- Aug. 27 W Fall-term classes begin, 8:20 a.m.
- Aug. 29 F Friday classes do not meet; Monday classes meet instead.
- Sept. 1 M Labor Day; classes do not meet.
- Sept. 5 F Final deadline to apply for a fall-term Leave of Absence. See Leave of Absence, Withdrawal, and Readmission (p. 58).  
Withdrawal from Yale College on or before this date entitles a student to a full rebate of fall-term tuition. See *Undergraduate Regulations*.
- Sept. 8 M Course schedules due for the Class of 2018.\*
- Sept. 9 T Course schedules due for the Classes of 2017 and 2016.\*
- Sept. 10 W Course schedules due for the Class of 2015.\*  
All students planning to complete degree requirements at the end of the fall term must file a petition by this date. See Special Arrangements (p. 66).
- Sept. 20 S Withdrawal from Yale College on or before this date entitles a student to a rebate of one-half of fall-term tuition. See *Undergraduate Regulations*.
- Oct. 14 T Deadline to complete applications for financial aid for the 2015 spring term, for students not enrolled in the 2014 fall term. See *Undergraduate Regulations*.
- Oct. 15 W Deadline to apply for a spring-term 2015 Term Abroad. See Special Arrangements (p. 63).
- Oct. 17 F Midterm.  
Last day to withdraw from a fall-term course without the course appearing on the transcript. See Withdrawal from Courses (p. 49) and Grades (p. 39).  
Deadline to apply for double credit in a single-credit course. See Special Arrangements (p. 67).  
Withdrawal from Yale College on or before this date entitles a student to a rebate of one-quarter of the term's tuition. See *Undergraduate Regulations*.
- Oct. 21 T October recess begins, 11 p.m.
- Oct. 27 M Classes resume, 8:20 a.m.

- Nov. 7 F Last day to convert from the Credit/D/Fail option in a fall-term course to a letter grade. See Grades (p. 39).
- Nov. 21 F November recess begins, 9 p.m.
- Nov. 30 SU Last day to relinquish on-campus housing for the spring term without charge. See *Undergraduate Regulations*.
- Dec. 1 M Classes resume, 8:20 a.m.
- Dec. 5 F Classes end, 5:30 p.m.; reading period begins.  
Last day to withdraw from a fall-term course. See Withdrawal from Courses (p. 49) and Grades (p. 39).
- Dec. 11 TH Reading period ends.  
Deadline for all course assignments, other than term papers and term projects. This deadline can be extended only by a Temporary Incomplete authorized by the student's residential college dean.
- Dec. 12 F Final examinations begin, 9 a.m.†
- Dec. 17 W Examinations end, 5:30 p.m.; winter recess begins.  
Deadline for all term papers and term projects. This deadline can be extended only by a Temporary Incomplete authorized by the student's residential college dean.
- Dec. 18 TH Residences close, 12 noon.

### SPRING TERM 2015

- Jan. 7 W Residences open, 9 a.m.
- Jan. 11 SU Required freshman registration meetings, 9 p.m.
- Jan. 12 M Spring-term classes begin, 8:20 a.m.  
Upperclassmen pick up registration materials by 5 p.m. in their residential college dean's office.
- Jan. 16 F Friday classes do not meet; Monday classes meet instead.
- Jan. 19 M Martin Luther King Jr. Day; classes do not meet.
- Jan. 21 W Course schedules due for the Class of 2018.\*  
Final deadline to apply for a spring-term Leave of Absence. See Leave of Absence, Withdrawal, and Readmission (p. 58).  
Withdrawal from Yale College on or before this date entitles a student to a full rebate of spring-term tuition. See *Undergraduate Regulations*.
- Jan. 22 TH Course schedules due for the Classes of 2017 and 2016.\*
- Jan. 23 F Course schedules due for the Class of 2015.\*  
Last day for students in the Class of 2015 to petition for permission to complete the requirements of two majors.
- Feb. 5 TH Withdrawal from Yale College on or before this date entitles a student to a rebate of one-half of spring-term tuition. See *Undergraduate Regulations*.
- Mar. 5 TH Deadline to apply for a fall-term 2015 Term Abroad or a 2015–2016 Year Abroad. See Special Arrangements (p. 63).

Mar. 6	F	Midterm. Spring recess begins, 5:30 p.m. Last day to withdraw from a spring-term course without the course appearing on the transcript. See <i>Withdrawal from Courses</i> (p. 49) and <i>Grades</i> (p. 39). Deadline to apply for double credit in a single-credit course. See <i>Special Arrangements</i> (p. 67). Withdrawal from Yale College on or before this date entitles a student to a rebate of one-quarter of the term's tuition. See <i>Undergraduate Regulations</i> .
Mar. 23	M	Classes resume, 8:20 a.m.
Apr. 3	F	Last day to convert from the Credit/D/Fail option in a spring-term course to a letter grade. See <i>Grades</i> (p. 39).
Apr. 24	F	Classes end, 5:30 p.m.; reading period begins. Last day to withdraw from a spring-term course. See <i>Withdrawal from Courses</i> (p. 49) and <i>Grades</i> (p. 39).
Apr. 30	TH	Reading period ends. Deadline for all course assignments, other than term papers and term projects. This deadline can be extended only by a Temporary Incomplete authorized by the student's residential college dean.
May 1	F	Final examinations begin, 9 a.m. <sup>†</sup> Applications for fall-term Leaves of Absence due. See <i>Leave of Absence, Withdrawal, and Readmission</i> (p. 58).
May 6	W	Examinations end, 5:30 p.m. Deadline for all term papers and term projects. This deadline can be extended only by a Temporary Incomplete authorized by the student's residential college dean.
May 7	TH	Residences close for underclassmen, 12 noon.
May 13	W	Deadline to complete applications for financial aid for the fall and spring terms, 2015–2016. See <i>Undergraduate Regulations</i> .
May 18	M	University Commencement.
May 19	T	Residences close for seniors, 12 noon.

\* Late schedules from all classes are fined and may not include the Credit/D/Fail option. See *Grades and Registration and Enrollment in Courses* (p. 46).

† Please note that examinations will be held on Saturdays and Sundays, December 13 and 14 and May 2 and 3.

# YALE COLLEGE ADMINISTRATIVE OFFICERS

## ADMINISTRATIVE OFFICERS \*

Peter Salovey, Ph.D., President of the University  
Benjamin Polak, Ph.D., Provost of the University  
Jonathan Holloway, Ph.D., Dean of Yale College  
Tamar S. Gendler, Ph.D., Dean of the Faculty of Arts and Sciences  
Joseph W. Gordon, Ph.D., Deputy Dean; Dean of Undergraduate Education  
Jane Edwards, Ph.D., Senior Associate Dean; Dean of International and Professional Experience  
W. Marichal Gentry, M.S.W., Senior Associate Dean; Dean of Student Affairs; Dean of Freshman Affairs  
Mark J. Schenker, Ph.D., Senior Associate Dean; Dean of Academic Affairs  
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Judith D. Hackman, Ph.D., Associate Dean for Assessment  
Pamela Schirmeister, Ph.D., Associate Dean for Special Projects  
William A. Segraves, Ph.D., Associate Dean for Science Education  
Petronella Van Deusen-Scholl, Ph.D., Associate Dean for Foreign Language Education; Director of Center for Language Study  
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Melanie Boyd, Ph.D., Assistant Dean of Student Affairs; Special Adviser to the Dean on Gender Issues  
Rodney T. Cohen, Ed.D., Assistant Dean; Director of Afro-American Cultural Center  
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Saveena Dhall, Ed.M., Assistant Dean; Director of Asian American Cultural Center  
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Alfred E. Guy, Jr., Ph.D., Assistant Dean; Director of Yale College Writing Center  
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Theodore C. Van Alst, Jr., Ph.D., Assistant Dean  
Angela Gleason, Ph.D., Title IX Coordinator  
Gabriel G. Olszewski, M.A., University Registrar  
David P. Zupko, M.Ed., Deputy University Registrar  
Laurie H. Ongley, Ph.D., Communications Manager for Student and Faculty Administrative Services

\* This list of officers is accurate as of June 20, 2014.

**DEANS OF THE RESIDENTIAL COLLEGES**

Berkeley College, Mia Reinoso Genoni, Ph.D.

Branford College, Hilary Fink, Ph.D.

Calhoun College, April M. Ruiz, Ph.D.

Davenport College, Ryan A. Brasseaux, Ph.D.

Timothy Dwight College, Sarah Mahurin, Ph.D.

Jonathan Edwards College, Joseph C. Spooner, Ph.D.

Morse College, Joel Silverman, Ph.D.

Pierson College, Amerigo Fabbri, Ph.D.

Saybrook College, Christine M. Muller, Ph.D.

Silliman College, Jessie Royce Hill, M.S.

Ezra Stiles College, Camille Lizarribar, J.D., Ph.D.

Trumbull College, Jasmina Besirevic-Regan, Ph.D.

**ADMISSIONS AND FINANCIAL AID OFFICERS**

Jeremiah Quinlan, M.B.A., Dean of Undergraduate Admissions

Margit A. Dahl, B.A., Director of Undergraduate Admissions

Ernst Huff, M.S., Associate Vice President of Student and Faculty Administrative Services

Caesar Storlazzi, M.M., University Director of Financial Aid

Diane Frey, B.A., Director of Student Financial Services Center

Kerry Worsencroft, B.S., Director of Student Financial Services Operations

# FINAL EXAMINATION SCHEDULES

Rules governing the conduct of final examinations are given under Reading Period and Final Examination Period (p. 50).

An examination group number is assigned to every course. Examination group assignments are based on course meeting times, according to the following scheme. Hours shown are the times at which courses begin:

- |      |                            |      |                         |
|------|----------------------------|------|-------------------------|
| (31) | M, W, or F, 8:20 a.m.      |      |                         |
| (32) | M, W, or F, 9 or 9:25 a.m. | (22) | T or Th, 9 or 9:25 a.m. |
| (33) | M, W, or F, 10:30 a.m.     | (23) | T or Th, 10:30 a.m.     |
| (34) | M, W, or F, 11:35 a.m.     | (24) | T or Th, 11:35 a.m.     |
| (36) | M, W, or F, 1 or 1:30 p.m. | (26) | T or Th, 1 or 1:30 p.m. |
| (37) | M, W, or F, after 2 p.m.   | (27) | T or Th, after 2 p.m.   |

**Note:** With the exception of courses assigned to common examination groups, a change in class meeting time will alter the examination time.

Courses with multiple sections but a common examination are assigned to an examination group from (61) to (69). Typical assignments include (but are not limited to): (61) foreign languages; (63) introductory-level English; (64) introductory economics; (69) introductory mathematics.

The examination group (50) is assigned to courses whose times are published HTBA, or whose times belong to more than one of the groups listed above.

Courses in group (o) usually have no regular final examination, concluding instead with a term essay or other final exercise. Instructors of such courses may schedule a regular final examination based on the course starting time.

Final examination dates and times for 2014–2015 are:

2014	9 a.m.	2 p.m.	7 p.m.	2015	9 a.m.	2 p.m.	7 p.m.
12 Dec. F	(27)	(32)		1 May F	(32)	(34)	
13 Dec. Sa	(63)	(23)	(31)	2 May Sa	(63)	(26)	(31)
14 Dec. Su		(26)	(64)	3 May Su		(23)	(64)
15 Dec. M	(22)	(34)	(69)	4 May M	(69)	(33)	(27)
16 Dec. Tu	(37)	(61)	(36)	5 May T	(22)	(61)	(37)
17 Dec. W	(24)	(33)		6 May W	(36)	(24)	

A student who in a given term elects two courses with the same examination group number will be charged \$35 for a make-up examination. (See “Postponement of Final Examinations” under Completion of Course Work.)

# SUBJECT ABBREVIATIONS

ACCT	Accounting	G&G	Geology and Geophysics
AFAM	African American Studies	GLBL	Global Affairs
AFST	African Studies	GMAN	Germanic Languages and Literatures
AKKD	Akkadian	GREK	Ancient Greek
AMST	American Studies	HEBR	Hebrew
AMTH	Applied Mathematics	HIST	History
ANTH	Anthropology	HLTH	Global Health Studies
APHY	Applied Physics	HNDI	Hindi
ARBC	Arabic	HSAR	History of Art
ARCG	Archaeological Studies	HSHM	History of Science, Medicine, and Public Health
ARCH	Architecture	HUMS	Humanities
ART	Art	INDN	Indonesian
ASTR	Astronomy	ITAL	Italian
BENG	Biomedical Engineering	JAPN	Japanese
BIOL	Biology	JDST	Judaic Studies
BNGL	Bengali	KHMR	Khmer
BRST	British Studies	KREN	Korean
CENG	Chemical Engineering	LAST	Latin American Studies
CGSC	Cognitive Science	LATN	Latin
CHEM	Chemistry	LING	Linguistics
CHLD	Child Study Center	LITR	Literature
CHNS	Chinese	MATH	Mathematics
CLCV	Classical Civilization	MB&B	Molecular Biophysics and Biochemistry
CLSS	Classics	MCDB	Molecular, Cellular, and Developmental Biology
CPAR	Computing and the Arts	MENG	Mechanical Engineering
CPSC	Computer Science	MGRK	Modern Greek
CZEC	Czech	MMES	Modern Middle East Studies
DEVN	DeVane Lecture Course	MUSI	Music
DRST	Directed Studies	NAVY	Naval Science
DUTC	Dutch	NELC	Near Eastern Languages and Civilizations
EALL	East Asian Languages and Literatures	PERS	Persian
EAST	East Asian Studies	PHIL	Philosophy
ECON	Economics	PHYS	Physics
EDST	Education Studies	PLSC	Political Science
E&EB	Ecology and Evolutionary Biology	PLSH	Polish
EENG	Electrical Engineering	PORT	Portuguese
EGYP	Egyptian	PSYC	Psychology
ENAS	Engineering and Applied Science	RLST	Religious Studies
ENGL	English Language and Literature	ROMN	Romanian
ENVE	Environmental Engineering	RSEE	Russian and East European Studies
EP&E	Ethics, Politics, and Economics	RUSS	Russian
ER&M	Ethnicity, Race, and Migration	SAST	South Asian Studies
EVST	Environmental Studies		
F&ES	Forestry & Environmental Studies		
FILM	Film Studies		
FREN	French		



SBCR	Bosnian-Croatian-Serbian
SCIE	Science
SKRT	Sanskrit
SLAV	Slavic Languages and Literatures
SNHL	Sinhala
SOCY	Sociology
SPAN	Spanish
SPEC	Special Divisional Major
STAT	Statistics
STCY	Study of the City
SWAH	Kiswahili
TAML	Tamil
TBTN	Tibetan
THST	Theater Studies
TKSH	Turkish
UKRN	Ukrainian
USAF	Aerospace Studies
VIET	Vietnamese
WGSS	Women's, Gender, and Sexuality Studies
YORU	Yorùbá
ZULU	isiZulu

# A MESSAGE FROM THE DEAN OF YALE COLLEGE

We officially call this publication *Yale College Programs of Study*, but generations of students and faculty have known it simply as the Blue Book. A compendium of roughly 2,000 courses to be offered in Yale College in 2014–2015, the Blue Book is a resource to use. Bookmark pages you wish to return to; browse the subjects that you find yourself called to. Let the Blue Book be your key to the renowned faculty at Yale, through whose courses you will develop the intellectual knowledge, skills, and sense of citizenship that will serve you all the days of your lives.

Of course, a listing of individual courses does not constitute an education. To help shape that education, we offer you the counsel of faculty and deans and the guiding principles of our distributional requirements, but in the end we are counting on you to explore your old passions and new interests in ways that will lead you to become cultivated citizens of the world. Our expectation is that when you leave Yale, you will not only have acquired a trained mind, broadened knowledge, and a greater sense of citizenship; you also will have come to a deeper understanding of the continuing joy of disciplined learning.

We hope that perusing the pages of this catalog will stir you to consider courses of study that you had never before imagined and lead you deeper into intellectual worlds you already have explored. The Blue Book represents the heart and soul of what the Yale faculty holds in promise for you. It comes to you with our best wishes for a successful year.

Jonathan Holloway  
*Dean of Yale College*  
*Professor, African American Studies and History*

# I. YALE COLLEGE

## The Undergraduate Curriculum

Yale College, founded in 1701, is a coeducational undergraduate institution offering instruction in the liberal arts and sciences to about 5,200 students. The College is the oldest and the largest school of the University, which also comprises the Graduate School of Arts and Sciences and ten professional schools.

Yale College offers a liberal arts education, one that aims to cultivate a broadly informed, highly disciplined intellect without specifying in advance how that intellect will be used. Such an approach to learning regards college as a phase of exploration, a place for the exercise of curiosity and an opportunity for the discovery of new interests and abilities. The College does not seek primarily to train students in the particulars of a given career, although some students may elect to receive more of that preparation than others. Instead, its main goal is to instill knowledge and skills that students can bring to bear in whatever work they eventually choose. This philosophy of education corresponds with that expressed in the Yale Report of 1828, which draws a distinction between “expanding [the mind’s] powers, and storing it with knowledge.” Acquiring facts is important, but learning how to think critically and creatively in a variety of ways takes precedence.

To ensure that study is neither too narrowly focused nor too diffuse, the College stands behind the principle of distribution of studies as strongly as it supports the principle of concentration. It requires that study be characterized, particularly in the earlier years, by a reasonable diversity of subject matter and approach, and in the later years by concentration in one of the major programs or departments. In addition, the College requires that all students take courses in certain foundational skills—writing, quantitative reasoning, and foreign language—that hold the key to opportunities in later study and later life. People who fail to develop these skills at an early stage unknowingly limit their futures. In each skill, students are required to travel some further distance from where they were in high school for the reason that these competences mature and deepen. The best high school writer is still not the writer he or she could be; students who do not use their mathematics or foreign language skills in college commonly lose abilities they once had, and can graduate knowing less than when they arrived.

In a time of increasing globalization, both academic study of the international world and firsthand experience of foreign cultures are crucial. No Yale College student can afford to remain ignorant of the forces that shape our world. Yale College urges all of its students to consider a summer, a term, or a year abroad sometime during their college careers.

A student working toward a bachelor’s degree takes four or five courses each term, and normally receives the B.A. or B.S. degree after completing thirty-six term courses or their equivalent in eight terms of enrollment. To balance structure with latitude, and to achieve a balance of breadth and depth, a candidate for the bachelor’s degree

is required, in completing the thirty-six term courses, to fulfill the distributional requirements described in this bulletin as well as the requirements of a major program.

## ADVISING

What students ultimately take away from their four years at Yale largely depends on the careful planning they apply to their programs of study. It would be premature—and unrealistic—for beginning students to map out a fixed schedule of courses for the subsequent four years, yet it is advisable that they think ahead and make plans for the terms to come. There will be time and opportunity for students to revise such plans as their academic ideas develop.

Yale College does not prescribe a set program of study, in the belief that students who select their own courses are inevitably more engaged with them. As students shape their educational goals it is important that they seek informed advice, and the best advising happens when students and advisers share a foundation of common intellectual interests.

For incoming students, who have not yet developed relationships with academic advisers, Yale College furnishes a unique constellation of advising linked to the residential colleges. Parts of this constellation include the residential college deans, freshman faculty advisers, and freshman (peer) counselors.

After freshman year, the selection of academic advisers is contingent on the student's intended major field. Sophomores who plan to major in the humanities or the social sciences select a sophomore adviser from among the Yale College faculty; those who plan to major in the sciences, engineering, or mathematics select as their adviser the designated representative in their potential major, often the director of undergraduate studies. The academic adviser for juniors and seniors in most majors is the director of undergraduate studies or a designated departmental representative. Moreover, seniors in most majors have the opportunity to select a senior essay or senior project adviser from among the faculty members in their major department or program.

In addition to these advisers, students often seek advice about academics, internship and research opportunities, student life, study abroad, and postgraduation options from other offices on campus, including the Center for International and Professional Experience, the Health Professions Advisory Board, Undergraduate Career Services, the University Libraries, the Yale College Dean's Office, and the cultural centers. It is not any one adviser's job to mandate a particular set of courses, but rather to help students gather information in order to craft an effective program of study.

## Distributional Requirements

The distributional requirements, described below, are intended to assure that all graduates of Yale College have an acquaintance with a broad variety of fields of inquiry and approaches to knowledge. These requirements are the only specific rules limiting the selection of courses outside a student's major program. By themselves, the distributional requirements constitute a minimal education, not a complete one, and represent the least that an educated person should seek to know. They are to be embraced as starting points, not goals.

## DISTRIBUTIONAL REQUIREMENTS FOR THE BACHELOR'S DEGREE

Students must fulfill disciplinary area requirements by taking no fewer than two course credits in the humanities and arts, two in the sciences, and two in the social sciences. Students must also fulfill skills requirements by taking at least two course credits in quantitative reasoning, two course credits in writing, and courses to further their foreign language proficiency. Depending on their level of accomplishment in foreign languages at matriculation, students may fulfill this last requirement with one, two, or three courses or by certain combinations of course work and approved study abroad.

**Area requirement in the humanities and arts (two course credits)** Study of the humanities and arts—those subjects that explore the broad range of human thought, expression, and endeavor—cultivates an educated recognition of the greatest accomplishments of the past and enriches the capacity to participate fully in the life of our time. Exploration of other civilizations, ancient and modern, gives students insight into the experiences of others and informs critical examination of their own culture. Those who create or perform works of art experience firsthand the joy and discipline of artistic expression. By rigorously and systematically examining the value and purpose of all that surrounds them, students of the humanities and arts can acquire essential preparation for many different kinds of careers. But independently of any particular application, study of these subjects fosters understanding of, and delight in, the reach and sweep of the human spirit.

**Area requirement in the sciences (two course credits)** Acquiring a broad view of what science is, what it has achieved, and what it might continue to achieve is an essential component of a college education. Close study of a science develops critical faculties that educated citizens need. These include an ability to evaluate the opinions of experts, to distinguish special pleading and demagoguery from responsible science, and to realize which things are known and which unknown—which are knowable and which unknowable—to science. The theoretical inquiry, experimental analysis, and firsthand problem solving inseparable from studying a science give rise to new modes of thought. To know science is to appreciate a thousand intricacies in nature and the universe, which are hidden from casual observation but which, once revealed, lend richness to everyday life.

**Area requirement in the social sciences (two course credits)** Insights attained through the social sciences take on a critical significance at a time when the world's population is increasing rapidly and diverse cultures are coming into closer contact and sometimes into conflict. One major field of inquiry in the social sciences is international and area studies. Those who have been educated in the United States ought especially to acquire knowledge of cultures outside North America and western Europe, as well as broaden their understanding of the societies they know. Questions of class, gender, and identity are also central to work in the social sciences, whose methods test for connections between the familiar and the exotic, the traditional and the contemporary, the individual and the group, the predicted result and the anomalous outcome. Social science theories propose explanations for the entire range of human phenomena, from governments and economies to social organizations, communicative systems, cultural practices, and individual psychology.

**Skills requirement in foreign language (at least one course, depending on preparation)** The study of languages has long been one of the distinctive and defining features of a liberal arts education, and in the world of the twenty-first century, knowledge of more than one language is increasingly important. The benefits of language study include enhanced understanding of how languages work, often resulting in heightened sophistication in the use of one's own language; unmediated access to texts otherwise available only in translation, or not at all; and the ability to recognize and cross cultural barriers.

All Yale College students are required to engage in study of a foreign language, regardless of the level of proficiency at the time of matriculation. Depending on their preparation, students take one, two, or three terms of foreign language study to fulfill the distributional requirement. Students may complete an approved study abroad program in lieu of intermediate or advanced language study at Yale. Details of the foreign language distributional requirement are listed under Distributional Requirements (p. 32) in the Academic Regulations (p. 32).

**Skills requirement in quantitative reasoning (two course credits)** The mental rigor resulting from quantitative study has been celebrated since ancient times, and applications of quantitative methods have proven critical to many different disciplines. Mathematics and statistics are basic tools for the natural and the social sciences, and they have become useful in many of the humanities as well. Information technology and the rigorous dissection of logical arguments in any discipline depend on algorithms and formal logical constructs. An educated person must be able to use quantitative information to make, understand, and evaluate arguments.

Many quantitative reasoning courses are taught through the departments of Mathematics, Statistics, and Computer Science. Such courses may also be found in Architecture; Astronomy; Chemistry; Economics; Engineering; Environmental Studies; Geology and Geophysics; Global Affairs; Linguistics; Molecular, Cellular, and Developmental Biology; Philosophy; Physics; Political Science; Psychology; and Sociology.

**Skills requirement in writing (two course credits)** The ability to write well is one of the hallmarks of a liberal education and is indispensable to advanced research in most disciplines. As students strengthen their writing skills, they develop intellectual practices that distinguish active from passive learners.

The English department in particular offers many courses that focus on writing clearly and cogently, and courses in other departments stress writing skills within the context of their disciplines. Over 130 courses, spanning approximately 40 different academic programs, give special attention to writing. Such courses, designated WR in the course listings, do not necessarily require more writing than other courses; rather, they provide more help with writing assignments. Some characteristics of WR courses include writing to discover ideas, learning from model essays, detailed feedback, and reviewing writing in small groups. Note that credit toward the writing requirement cannot be earned in courses in creative writing (specifically poetry, fiction, and playwriting) nor in courses conducted in a language other than English.

## Major Programs

All candidates for a bachelor's degree in Yale College must elect a major program. The requirements for a major are described in general terms in the sections below, and in more detail under Subjects of Instruction. Students plan a schedule of courses in their major in consultation with a representative of the department or program concerned, and must secure the consultant's written approval. Students should acquaint themselves fully with all the requirements of the major they plan to enter, considering not only the choice of courses in the current term but also the plan of their entire work in the last two or three years in college.

Students seeking the B.S. or the B.A. degree with a major in science are expected to declare their majors at the beginning of sophomore year, although a student who has completed the prerequisites may elect a science major later. Sophomores interested in majoring in science should have their schedules approved by the director of undergraduate studies or the adviser designated by the department. Students seeking the B.A. degree with a major in a field other than a science typically declare their major at the beginning of the junior year. In the sophomore year these students' schedules are signed by a sophomore adviser, chosen by the student, with whom the program has been discussed.

### SELECTION OF A MAJOR

In designing a program of study, the student ought to plan for depth of concentration as well as breadth of scope. To study a subject in depth can be one of the most rewarding and energizing of human experiences, and can form the basis of the interests and occupations of a lifetime. Knowledge advances by specialization, and one can gain some of the excitement of discovery by pressing toward the outer limits of what is known in a particular field. Intense study of a seemingly narrow area of investigation may disclose ramifications and connections that alter perspectives on other subjects. Such study also sharpens judgment and acquaints a person with processes by which new truths can be found.

In order to gain exposure to this kind of experience, students must elect and complete a major, that is, the subject in which they will work more intensively than in any other. Yale College offers more than seventy possible majors (p. 88). The department or program concerned sets the requirements for each major, which are detailed under Subjects of Instruction.

Some students will have made a tentative choice of a major before entering college. Others will have settled on a general area—for example, the natural sciences or the humanities—without being certain of the specific department or program of their major. Still others will be completely undecided. Many students who arrive with their minds made up change them after a year or two. Even students who feel certain of their choices should keep open the possibility of a change. In selecting courses during their first two years, students should bear in mind not only the distributional requirements, but also the need for some exploration of the subjects to which they feel drawn.

### THE MAJOR (B.A. OR B.S.)

A major program usually includes twelve term courses in the same area, progressing from introductory to advanced work, which become the focus of a student's program

in the junior and senior years. Majors are offered by departments, interdepartmental programs, or interdisciplinary programs. In many departments and programs, a limited number of courses in related fields may be offered in fulfillment of the requirements for the major. Many majors have prerequisites of two or more term courses taken in the freshman and sophomore years.

In all majors, the student must satisfy a senior requirement, usually a senior essay, senior project, or senior departmental examination. In an intensive major, the student must fulfill additional requirements, such as taking a prescribed seminar, tutorial, or graduate course, or completing some other project in the senior year.

### **SPECIAL DIVISIONAL MAJORS**

A Special Divisional Major affords an alternative for the student whose academic interests cannot be met within one of the existing major programs. Such students may, with the approval of the Committee on Honors and Academic Standing, design special majors of their own in consultation with members of the faculty and in accordance with the procedures (p. 653) outlined under Subjects of Instruction. A Special Divisional Major may not be offered as one of two majors.

## **The Residential Colleges**

The most conspicuous advantage of a university is that it presents students with a great breadth of learning and gives them access to scholars who are engaged not only in communicating knowledge but also in discovering it. But the potential disadvantages of a large university are that its size and complexity may discourage communication, and that teachers and students may become less of a challenge to each other. In such an event, the discovery of new knowledge suffers as much as do teaching and learning.

In order to mitigate such disadvantages as it grew from a small college into a modern research university, Yale established residential colleges. Initially made possible through gifts from Edward Stephen Harkness, B.A. 1897, the colleges are more than living quarters; they are small communities of men and women whose members know one another well and learn from one another. Each college has its own dining hall, library, common rooms, extracurricular activity spaces, and intramural athletic teams, and each college celebrates the progress of the academic year with various festivities, concerts, and dramatic presentations.

There are twelve colleges: Berkeley, Branford, Calhoun, Davenport, Timothy Dwight, Jonathan Edwards, Morse, Pierson, Saybrook, Silliman, Ezra Stiles, and Trumbull. At the head of each college is a resident master; and in each college a dean advises students on both academic and nonacademic matters. Associated with the master and the dean as fellows are about fifty additional members of the University drawn from different departments and schools. A few fellows reside in the college; others have offices there.

In the summer before arrival, each freshman is assigned to one of the twelve residential colleges. Most freshmen reside in a quadrangle known as the Old Campus. Whether freshmen live there or elsewhere on campus, they participate fully in the life of their residential college. All freshmen and sophomores are required to live on campus, and most juniors and seniors choose to do so. Whether they live on campus or off, students normally remain members of the same college throughout their undergraduate careers.



## International Experience

While students can be introduced to the dynamics of a globalizing world through the course offerings at Yale, experience abroad is an invaluable complement to academic training. Such experience may include course work at foreign universities, intensive language training, directed research, independent projects, internships, laboratory work, and volunteer service. Yale College provides a variety of international opportunities during term time, summers, and post-graduation, as well as a large and growing number of fellowships to support students abroad.

Students can visit the Center for International and Professional Experience (<http://cipe.yalecollege.yale.edu>) to explore options for study abroad, search for international internships and careers, and seek funding for study, research, and work experiences off campus. Summer courses abroad are offered by Yale Summer Session (<http://summer.yale.edu>) and by eligible outside programs through Summer Abroad (<http://www.yale.edu/studyabroad>). Students on financial aid may be eligible for summer funding through the International Summer Award program (<http://www.yale.edu/yalecollege/international/funding/isa>).

### YEAR OR TERM ABROAD

In recognition of the special value of formal study abroad, Yale College allows juniors and second-term sophomores to earn a full year or term of credit toward the bachelor's degree through the Year or Term Abroad program. Participation in the program provides students the opportunity to approach academic study through a different cultural perspective and, most significantly, to speak, write, and learn in a foreign language. Students apply to the Yale College Committee on the Year or Term Abroad for approval of a program of study abroad. The pertinent application procedures and regulations are listed under Special Arrangements (p. 63) in the Academic Regulations. Additional information is available from the Study Abroad office in the Center for International and Professional Experience (<http://www.yale.edu/studyabroad>).

### YALE-IN-LONDON

The Yale-in-London program offers spring-term courses in British culture and society at the Paul Mellon Centre for Studies in British Art, located in central London. The program is open to undergraduates, carries full Yale course credit, and counts as a term of enrollment. Instruction is designed to take advantage of the cultural resources of London and its environs, with regular field trips (including overnight stays) to museums, historic houses, and other sites of interest. Accommodations are provided for students in shared apartments. Further information is available on the program's Web site (<http://britishart.yale.edu/education/yale-college-students/yale-in-london>), or from the Yale-in-London office at the Yale Center for British Art, or by e-mail to [yaleinlondon@yale.edu](mailto:yaleinlondon@yale.edu).

### YALE-IN-LONDON SUMMER PROGRAM

Yale-in-London offers two overlapping summer sessions at the Paul Mellon Centre for Studies in British Art, each lasting six weeks. There are two courses in each session, with topics in history, history of art, architecture, literature, and drama. The courses are open to undergraduates and carry full Yale course credit, although enrollment

in Yale-in-London summer session does not count as a term of enrollment in Yale College. Overnight field trips may be included. Accommodations are provided. Course descriptions and further information are available on the program's Web site (<http://britishart.yale.edu/education/yale-college-students/yale-in-london>), or from the Yale-in-London office at the Yale Center for British Art, or by e-mail to [yaleinlondon@yale.edu](mailto:yaleinlondon@yale.edu).

### THE MACMILLAN CENTER

The Whitney and Betty MacMillan Center for International and Area Studies at Yale is the University's focal point for encouraging and coordinating teaching and research on international affairs and on societies and cultures around the world. It brings together scholars from relevant schools and departments to provide comparative and problem-oriented teaching and research on regional, international, and global issues. The MacMillan Center provides seven undergraduate majors, including six focused on world regions: African Studies, East Asian Studies, Latin American Studies, Modern Middle East Studies, Russian and East European Studies, and South Asian Studies. The seventh major, Global Affairs, is designed to help students gain a comprehensive understanding of international affairs. Language training is integral to each of the majors.

The MacMillan Center brings visiting scholars to Yale each year from a range of disciplines and countries; awards financial support to Yale students studying languages or traveling abroad; and sponsors lectures, conferences, workshops, symposia, films, and art events. The Center also produces *The MacMillan Report*, an Internet show that features Yale faculty in international and area studies. Further information about the MacMillan Center is available on the Center's Web site (<http://www.yale.edu/macmillan>).

### JACKSON INSTITUTE FOR GLOBAL AFFAIRS

The Jackson Institute's mission is to inspire and prepare Yale students for global citizenship and leadership. The Institute administers the undergraduate major in Global Affairs, with tracks in international development and international security. In addition, the Institute offers a number of courses that are open to students in Yale College, including GBLB 101, Gateway to Global Affairs.

Each year the Jackson Institute hosts Senior Fellows, leading practitioners and experts in global affairs who teach courses, give public lectures, and are available to consult with students on their career plans. The Jackson Institute's career services office serves as a resource for Yale College students contemplating careers in public service and other areas of global affairs. For further information, consult the Institute's Web site (<http://jackson.yale.edu>).

## Yale Summer Session

Yale Summer Session offers courses in the humanities, social sciences, and sciences. Several summer courses, including language courses, are taught abroad, and some courses are taught on line. Courses in the Summer Session are in most cases similar to courses offered during the regular academic year, but in a more concentrated and intensive form. Yale College students may, if they wish, receive credit in Yale College for work successfully completed in Yale Summer Session. There are no auditing privileges

in Yale Summer Session. Further information is available from the Yale Summer Session office or on the Summer Session Web site (<http://summer.yale.edu>).

## Special Programs

### DIRECTED STUDIES

Directed Studies is a selective freshman interdisciplinary program in Western civilization. One hundred twenty-five freshmen are admitted to the program each fall.

The Literature, Philosophy, and History and Politics tracks of Directed Studies together comprise one coherent program of study, and students must enroll in all three tracks simultaneously. Successful completion of the fall-term Directed Studies courses is a prerequisite to enrolling in the spring-term courses.

The Freshman Web site (<http://yalecollege.yale.edu/content/directed-studies-ds>) describes the program and explains the application procedure. Additional information is available on the program's Web site (<http://www.yale.edu/directedstudies>).

### PERSPECTIVES ON SCIENCE AND ENGINEERING

Perspectives on Science and Engineering is a lecture and discussion course designed to supplement the standard academic program of a selected group of freshmen who have unusually strong backgrounds in science and mathematics. It explores a broad range of topics and exposes students to questions at the frontiers of science. It also highlights the interdependence of the various fields of science and raises issues about the relation between science and society. Participants attend biweekly lectures by distinguished members of the Yale science faculty. In the intervening weeks, groups of students and faculty participants discuss the previous lecture.

Enrollment is limited to about sixty freshmen who, having applied, are selected on the basis of outstanding records in mathematics and natural science. The Freshman Web site (<http://yalecollege.yale.edu/content/perspectives-science-and-engineering-pse>) provides further information and explains the application procedure.

### FRESHMAN SEMINAR PROGRAM

The Freshman Seminar program offers first-year students the opportunity to enroll in small classes with some of Yale's most eminent faculty members. Roughly forty freshman seminars across a wide range of subjects are offered every year, in both fall and spring terms. Some seminars provide an introduction to a particular field of study; others take an interdisciplinary approach to a variety of topics. Whatever the subject and method of instruction, all seminars are designed with freshmen in mind and provide a context for developing relationships with faculty members and peers.

A description of the program and application procedures can be viewed on the program's Web site (<http://yalecollege.yale.edu/content/freshman-seminar-program-2>).

### RESIDENTIAL COLLEGE SEMINARS

The Residential College Seminar program, instituted in 1968, is devoted to the development of innovative courses that fall outside departmental structures. Courses arise through the joint initiative of students and members of the faculty who are fellows

of the residential colleges. The instructors for the seminar program are drawn from the University community and from the region, including individuals outside academic life such as writers, artists, participants in government and the public sector, and experts from the arts and the media. The college seminar program encourages innovation and experimentation, but all courses in the program must satisfy standard requirements for academic credit in Yale College and must be approved by the relevant faculty committees that oversee the curriculum.

Each residential college sponsors at least one seminar each term. Additional seminars are occasionally sponsored directly by the program and are equally open to students from all residential colleges. Descriptions of the seminars are found on the program's Web site (<http://yalecollege.yale.edu/content/residential-college-seminar-program>).

### THE DEVANE LECTURES

The DeVane Lectures are a special series of lectures that are open to the general public as well as to students and to other members of the Yale community. They were established in 1969 in honor of William Clyde DeVane, Dean of Yale College from 1939 to 1963. The next set of DeVane Lectures will be offered in fall 2014. Richard Prum, William Robertson Coe Professor of Ornithology, Department of Ecology and Evolutionary Biology, will offer "The Evolution of Beauty." Details of the course are listed under DeVane Lecture Course (p. 222) in Subjects of Instruction. Supplementary meetings will be held for those students taking the lectures for credit.

### RESERVE OFFICERS TRAINING CORPS (ROTC)

Yale hosts both Naval and Air Force ROTC units, which offer qualified Yale College students an opportunity to pursue their regular Yale degrees while also preparing for leadership positions in the United States Air Force, Navy, or Marine Corps. Regardless of financial need, participating students may receive significant help in meeting the costs of a Yale education. Further information about the Air Force ROTC program can be found on the Yale AFROTC Web site (<http://afrotc.yalecollege.yale.edu>) or under Aerospace Studies (p. 89) in Subjects of Instruction. Further information about the Naval ROTC program (including the Marine Corps program) can be found on the Yale NROTC Web site (<http://nrotc.yalecollege.yale.edu>) or under Naval Science (p. 546) in Subjects of Instruction. Students not matriculated at Yale who are participating in a Yale ROTC program as part of a cross-town arrangement are subject to Yale College's *Undergraduate Regulations* (<http://yalecollege.yale.edu/campus-life/undergraduate-regulations>).

### FRANCIS WRITER-IN-RESIDENCE

The Francis Writer-in-Residence in Yale College is a distinguished writer of nonfiction who teaches either one or two term courses each academic year. He or she is actively engaged with undergraduate life and serves as an academic mentor through seminars, readings, meetings with students, and other activities. The Francis Writer-in-Residence for 2014–2015 is Anne Fadiman.

### ROSENKRANZ WRITER-IN-RESIDENCE

The Rosenkranz Writer-in-Residence in Yale College is a distinguished professional writer, chosen from fiction writers, playwrights, critics, journalists, screenwriters, essayists, poets, and social commentators. Both as a fellow of a residential college and

as an instructor of one or two courses in each academic year, the Rosenkranz Writer-in-Residence meets formally and informally with students through classes and through readings and extracurricular activities. The Rosenkranz Writer-in-Residence for 2014–2015 is Louise Glück.

### **YALE JOURNALISM INITIATIVE**

The Yale Journalism Initiative brings a distinguished writer to campus to teach an advanced journalism seminar, ENGL 467. Students who complete the seminar may apply to become Yale Journalism Scholars, a distinction that provides access to summer support for internships, career counseling with a journalism specialist in the Writing Center, and invitations to meet professional journalists at events both on and off campus. For more information on the initiative or on becoming a Journalism Scholar, see the Journalism Initiative Web site (<http://writing.yalecollege.yale.edu/yale-journalism-initiative>).

### **EDUCATION STUDIES UNDERGRADUATE SCHOLARS PROGRAM**

The Education Studies Undergraduate Scholars program establishes an interdisciplinary cohort of scholars drawn from Yale College freshmen, sophomores, juniors, and seniors. Each Undergraduate Scholar develops a course plan within the Education Studies curriculum that advances their interests in one of the various aspects of education studies, culminating in a capstone seminar. Undergraduate Scholars gain practical experience through an appropriate academic-year or summer educational opportunity, and they explore educational topics through collaboration, colloquia, and advising relationships with mentors. Students may apply to the Education Studies Undergraduate Scholars program in their freshman or sophomore year after they have successfully completed the foundation course, EDST 110, Foundations in Education Studies. For more information, see the program's Web site (<http://yalecollege.yale.edu/content/education-studies>).

### **ENERGY STUDIES UNDERGRADUATE SCHOLARS PROGRAM**

Yale Climate & Energy Institute (YCEI) sponsors the Energy Studies Undergraduate Scholars program. The program promotes a multidisciplinary approach to the linked challenges of energy and climate, and provides students with training in the science and technology of energy, the environmental and social impacts of energy production and use, and the economics, planning, and regulation of energy systems and markets. Energy Studies Scholars acquire the broad knowledge and skills needed for advanced studies and for leadership in energy-related fields. Further information is available on the program's Web site (<http://climate.yale.edu/prog-init/undergraduate-scholars-energy-studies>).

### **SPECIAL ACADEMIC PROGRAM IN HUMAN RIGHTS**

The Special Academic Program in Human Rights seeks to equip students with an academic foundation from which to engage meaningfully with human rights scholarship and practice. The program is based on an understanding that human rights constitutes a rich and interdisciplinary field of study, drawing on bodies of work in history, literature, economics, political science, philosophy, anthropology, law, and area studies. The program provides students with relevant analytical, conceptual, and

practical skills; connects students to affiliated faculty and peers; supports student research projects and internship opportunities; and offers career guidance in the field. For more information see the Human Rights program Web site (<http://humanrights.yale.edu>).

### CENTER FOR LANGUAGE STUDY

The Center for Language Study (CLS), located at 370 Temple St., provides resources for students of foreign languages, as well as courses and support for nonnative speakers of English through its English Language Program. For undergraduates enrolled in a foreign language course, the CLS offers peer tutoring in the target language. For students in Yale College and in the graduate and professional schools, the CLS offers specialized language programs such as Directed Independent Language Study (<http://cls.yale.edu/dils>) (DILS) for the study of languages not taught at Yale, and the Fields program (<http://cls.yale.edu/fields>) for discipline-specific and advanced language study. For professional school students, the CLS offers courses in language for special purposes, such as Spanish or Chinese for medical professionals. All language learners at Yale have access to CLS facilities, including its study rooms and multimedia labs. For more information, including hours, a list of resources, and information about Yale's foreign language requirement and placement testing, see the Center's Web site (<http://cls.yale.edu>).

### EXPOSITORY WRITING

The Yale College Writing Center supports a range of courses and tutoring services to help undergraduates improve their writing. The English department offers several courses specifically designed to prepare students for writing throughout the University, and other departments in the humanities, social sciences, and sciences complement this offering with courses (designated WR in the course listings) that give special attention to the conventions and expectations of writing in particular disciplines.

Beyond the regular departmental offerings, the Writing Center provides several ways for students to get help with writing. The most important of these is the presence of a Writing Tutor in each residential college. Tutors meet with students on a one-to-one basis to discuss rough drafts of work in progress, research techniques, revision strategies, or other matters relevant to effective writing. Tutors can help with any writing project: senior essays, course papers, graduate school and fellowship applications, or anything intended for publication. The Writing Partners, another resource, are undergraduate and graduate students who offer drop-in help to students at any stage of writing. Finally, the Writing Center Web site (<http://writing.yalecollege.yale.edu/using-sources>) offers information on using sources effectively and avoiding plagiarism.

The Yale College Writing Center is maintained through the continuing support of the Bass family, the Newhouse Foundation, and other foundations. Its mission is to encourage excellence in writing and the use of writing for learning throughout the College. More detailed information is available on the Writing Center Web site (<http://writing.yalecollege.yale.edu>).

## SCIENCE AND QUANTITATIVE REASONING

The Yale College Science and Quantitative Reasoning Center oversees programs for the enrichment of education in the sciences and quantitative disciplines. In addition to supporting faculty in the enhancement of teaching, the Center provides tutoring services and programs that enable students to participate in faculty-mentored research and engineering projects.

The Residential College Math and Science Tutoring program offers tutoring in the residential colleges to all Yale College students. Tutoring is available at scheduled times and on a walk-in basis, and is provided in all areas of math and science as well as in economics. Information about tutoring can be found at each residential college dean's office and on the Residential College Math and Science Tutoring Web site (<http://science.yalecollege.yale.edu/residential-college-math-science>).

To assist students who require more personalized or longer-term support than can be provided by the Residential College Math and Science Tutoring program, the Science and Quantitative Reasoning Center also administers a Science and QR Tutoring program. This program provides individual tutoring to undergraduates in the full range of science and quantitative disciplines, including economics. Any student enrolled in Yale College who is experiencing academic difficulty in a course, as confirmed by the instructor, is eligible for up to ten hours of tutoring per course each term free of charge. Further information is available at each residential college dean's office, at the Science and Quantitative Reasoning Center in 20 SSS, and on the Center's Web site (<http://science.yalecollege.yale.edu/science-quantitative-reasoning-1>).

## RESOURCE OFFICE ON DISABILITIES

To ensure that all students have an equal opportunity to make the most of their Yale education, the Resource Office on Disabilities facilitates individual accommodations for students with disabilities, and works to remove physical and attitudinal barriers to their full participation in the University community. The office provides technical assistance, information, and disability awareness training to any member of the Yale community.

Current and prospective students with disabilities are encouraged to contact the Resource Office on Disabilities to schedule a meeting with staff at 35 Broadway (rear entrance), room 222. Inquiries can be made by mail to Resource Office on Disabilities, Yale University, P.O. Box 208305, New Haven, CT 06520-8305, or by phone at (203) 432-2324. Additional information is available on the Resource Office Web site (<http://yalecollege.yale.edu/content/resource-office-disabilities>).

## SIMULTANEOUS AWARD OF THE BACHELOR'S AND MASTER'S DEGREES

Yale College students with appropriate qualifications may enroll in courses in the Graduate School of Arts and Sciences. Such enrollment requires permission of the course's instructor and of the director of graduate studies of the department in which the course is offered.

A limited number of students of demonstrated ability may undertake graduate work that will qualify them for the simultaneous award of the bachelor's and master's degrees at the end of their senior year. Students apply to this program through their

director of undergraduate studies. Details of the requirements are listed under Special Arrangements (p. 63) in the Academic Regulations (p. 32).

## COMBINED BACHELOR'S AND MASTER'S DEGREE PROGRAMS IN THE PROFESSIONAL SCHOOLS

Well-qualified students may be able to structure their undergraduate programs so as to become eligible for a master's degree in Public Health, Forestry & Environmental Studies, or Music after one additional year of graduate study at Yale. For more information see the respective program descriptions in Subjects of Instruction.

## ELI WHITNEY STUDENTS PROGRAM

The Eli Whitney Students program is designed for individuals with high academic potential who seek to obtain a bachelor of arts or bachelor of science degree from Yale College and who may need to study on a part-time basis. The program enrolls a small number of students who have demonstrated leadership and maturity and who enrich Yale College through their life experience, sense of purpose, and character.

A minimum of eighteen course credits from Yale as a matriculated student is required, and the degree must be completed within seven years. The program is described more fully under Eli Whitney Students Program (p. 75) in the Academic Regulations (p. 32). Additional information is available on the program's Web site (<http://admissions.yale.edu/eli-whitney>).

## YALE VISITING INTERNATIONAL STUDENT PROGRAM

The Yale Visiting International Student program (Y-VISP) invites selected undergraduate students from Y-VISP partner institutions to pursue full-time study in Yale College for one academic year. Y-VISP students maintain a full course load, live in the residential colleges alongside Yale College students, and are fully integrated members of Yale College's academic, residential, and extracurricular communities. Y-VISP oversight and governance is managed by the program's director and the Y-VISP Steering Committee. Additional information is available on the program's Web site (<http://www.yale.edu/yvisp>).

# Honors

## GENERAL HONORS

The bachelor's degree *cum laude*, *magna cum laude*, or *summa cum laude* is awarded at graduation on the basis of a student's general performance in courses taken at Yale. At Commencement, General Honors are awarded to no more than 30 percent of the class. The bachelor's degree is awarded *summa cum laude* to no more than the top 5 percent of the graduating class, *magna cum laude* to no more than the next 10 percent of the graduating class, *cum laude* to no more than the next 15 percent of the graduating class.



Eligibility for General Honors is based on the grade point average (GPA) earned in courses taken only at Yale, with letter grades carrying the following values:

A	4.00	B–	2.67	D+	1.33
A–	3.67	C+	2.33	D	1.00
B+	3.33	C	2.00	D–	0.67
B	3.00	C–	1.67	F	0.00

Marks of CR in courses taken on a Credit/D/Fail basis are not included in the calculation of grade point averages. Marks of W, for Withdrawal, carry no course credit, and do not figure in a grade point average.

### **DISTINCTION IN THE MAJOR**

Distinction in the Major is conferred at graduation on any senior who, on nomination by the student's department or program, and with the concurrence of the Committee on Honors and Academic Standing, merits such an award for the quality of work completed in the major subject.

Distinction is awarded to students who have earned grades of A or A– in three-quarters of the credits in the major subject or program and who have earned a grade of A or A– on the senior departmental examination, senior essay, or senior project. All courses taken for the major are included in these calculations for Distinction in the Major. Grades of F and marks of CR in courses taken Credit/D/Fail are included as non-A grades. Marks of W, for Withdrawal, carry no course credit, and do not figure in the calculation for Distinction.

### **PHI BETA KAPPA**

Election to Phi Beta Kappa is based on the percentage of grades of A earned at Yale. The grade point average (GPA) is not a factor. Marks of CR in courses taken Credit/D/Fail are counted as non-A grades. Marks of W, for Withdrawal, carry no course credit, and do not figure in the calculation for Phi Beta Kappa. Grades earned outside Yale, including those earned during study abroad other than at Yale-in-London, are also not included in the calculation. Further information about the criteria for election and about the Yale chapter can be found on the Yale Phi Beta Kappa Web site (<http://www.yale.edu/pbk/home>).

### **PRIZES**

For a list of the numerous prizes open annually to students in Yale College, consult the Yale Prizes Web site (<http://secretary.yale.edu/services-resources/lectureships-fellowships-and-prizes>).

## **Miscellaneous**

Expenses and expected patterns of payment are described in the *Undergraduate Regulations*, published on line by the Yale College Dean's Office. The *Undergraduate Regulations* also provides details of student coverage in the Yale Health medical plan. Information about financing a Yale education can be found on the Web site of Student Financial Services (<http://www.yale.edu/sfas/finaid>).

## II. ACADEMIC REGULATIONS

### Academic Regulations

*As a condition of enrollment in Yale College, every student is required to comply with the academic regulations. Students are expected to familiarize themselves with these regulations, and an assertion of ignorance of their provisions cannot be accepted as a basis for an exception to them. No student or group of students should expect to be warned individually to conform to any of the regulations contained in this publication. Students are advised to pay special attention to all deadlines given in the academic regulations. Students who have questions or concerns about these regulations should consult with their residential college dean.*

### A. Requirements for the B.A. or B.S. Degree

To qualify for the bachelor's degree, B.A. or B.S., a student must successfully complete thirty-six term courses in Yale College or their equivalent. In doing so, the student must fulfill the distributional requirements of Yale College and the requirements of a major program. A student may normally complete no more than eight terms of enrollment in order to fulfill these requirements.

During the terms that students are enrolled and in residence in Yale College, they cannot be simultaneously enrolled, neither full-time nor part-time, in any other school or college at any other institution, with the exception of other Yale University schools that permit currently enrolled undergraduates to be admitted to programs that have been established within Yale College. Examples of such programs include the simultaneous award of the bachelor's and master's degree and the five-year B.A.-B.S./M.P.H. degree program in Public Health. Exceptions will also be made for Yale College students whose participation in the Reserve Officer Training Corps program requires enrollment in courses offered outside of Yale.

Students enrolled in the Eli Whitney Students program should consult section M, Eli Whitney Students Program (p. 75).

Students who have already earned a bachelor's degree, at Yale or at another institution, are not eligible for degree enrollment in Yale College.

#### DISTRIBUTIONAL REQUIREMENTS

All students in Yale College must fulfill distributional requirements in order to qualify for the bachelor's degree. For a general introduction to the distributional requirements and a definition of the disciplinary areas and skills categories, refer to the Undergraduate Curriculum (p. 17) section.

##### 1. **Distributional requirements for the freshman, sophomore, and junior years**

Students must partially fulfill the distributional requirements during the freshman, sophomore, and junior years in order to be eligible for promotion.

**Distributional requirements for the freshman year** Students must have enrolled for at least one course credit in two skills categories by the end of the second term of enrollment in order to be eligible for promotion to sophomore standing. They may elect no more than four course credits in a single department, and no more than six

course credits in a single disciplinary area, except that a student taking a laboratory course may elect as many as seven course credits in the sciences.

Note that credit from outside Yale may not be applied toward the distributional requirements for the freshman year; accordingly, students who are permitted by the Committee on Honors and Academic Standing to repair a deficiency in these requirements over the summer following freshman year must do so by means of enrollment in Yale Summer Session.

**Distributional requirements for the sophomore year** Students must have enrolled for at least one course credit in each of the three disciplinary areas and for at least one course credit in each of the three skills categories by the end of the fourth term of enrollment in order to be eligible for promotion to junior standing.

**Distributional requirements for the junior year** Students must have completed all of their skills requirements by the end of the sixth term of enrollment in order to be eligible for promotion to senior standing.

2. **Multiple distributional designations** Although some courses may carry more than one distributional designation, a single course may be applied to only one distributional requirement. For example, if a course is designated both HU and SO it may be applied toward either the humanities and arts requirement or the social science requirement, but not both. Similarly, if a course is designated QR and SC, it may be applied toward either the quantitative reasoning requirement or the science requirement, but not both.

A course with multiple distributional designations, once applied toward one distributional requirement, may subsequently be applied toward a different distributional requirement. During the summer after each academic year, the University Registrar's Office optimizes the use of each student's completed courses toward fulfillment of the distributional requirements.

3. **Foreign language distributional requirement** All students are required to engage in the study of a foreign language while enrolled in Yale College. The most common paths to fulfillment of the foreign language distributional requirement are illustrated in the chart at the end of this section.

Students who matriculate at Yale with no previous foreign language training must complete three terms of instruction in a single foreign language. This requirement is fulfilled by the completion of courses designated L1, L2, and L3. Students who have taken the Advanced Placement examination in French, German, or Spanish and who present scores of 5, or who have taken the Advanced Placement examination in Latin and who present scores of 4 or 5, are recognized as having completed the intermediate level of study. Scores of 6 or 7 on the International Baccalaureate Advanced-Level examination are also accepted as evidence of intermediate-level accomplishment. Students at this level fulfill the language distributional requirement by completing one course designated L5. Alternatively, they may successfully complete one or more courses in a different foreign language at least through the level designated L2.

Students who have studied a foreign language before matriculating at Yale but who have not achieved a score of 5 on the Advanced Placement test in French, German, or Spanish, or a score of 4 or 5 on the Advanced Placement test in Latin, must take a placement test offered by the appropriate language department or, for languages in

which no departmental placement test is offered, consult the appropriate director of undergraduate studies. Dates and times of placement tests are given in the *Calendar for the Opening Days of College* and on the Web site of the Center for Language Study (<http://cls.yale.edu>). The departmental test determines whether students place into the first, second, third, or fourth term of language study (courses designated L1, L2, L3, or L4), or whether they qualify for language courses beyond the fourth term of study (L5).

Students who place into the first term of a foreign language must successfully complete three courses in that language, designated L1, L2, and L3.

Students who matriculate at Yale able to place into the second term of a foreign language must successfully complete three courses in that language, designated L2, L3, and L4. Alternatively, they may successfully complete three courses in a different foreign language at least through the level designated L3.

Students who matriculate at Yale able to place into the third term of a foreign language must successfully complete two courses in that language, designated L3 and L4. Alternatively, they may successfully complete two or more courses in a different foreign language at least through the level designated L3.

Students who matriculate at Yale able to place into the fourth term of a foreign language must successfully complete one course in that language, designated L4. Alternatively, they may successfully complete one or more courses in a different foreign language at least through the level designated L3.

Students who matriculate at Yale able to place into the fifth term of a foreign language must successfully complete one course in that language, designated L5. Alternatively, they may successfully complete one or more courses in a different foreign language at least through the level designated L2.

Students whose secondary school transcript shows that the language of instruction was other than English may fulfill the foreign language requirement by successfully completing ENGL 114, 120, or 450. Alternatively, students in this category may fulfill the requirement by successfully completing one or more courses in a third language, neither English nor the language of their secondary school instruction, at least through the level designated L2.

In order to promote firsthand experience in foreign cultures and the learning of language in real-world settings, students are permitted to apply toward the satisfaction of the foreign language requirement the completion of an approved study abroad program in a foreign-language-speaking setting if they have first completed or placed out of a language course designated L2. Students seeking to undertake study at another institution or program for this purpose must consult the relevant director of undergraduate studies in advance of their proposed study for advice about appropriate programs and courses, and for information about the approval process. See section O, Credit from Other Universities (p. 79). Study abroad may be used in place of L1 and L2 courses only if it is part of a Yale College program, such as Yale Summer Session. Study abroad opportunities are described in the Yale Curriculum section under the heading International Experience (p. 23).

Intensive language courses provide the equivalent of a full year of instruction in a single term. A course designated L1–L2 fulfills both the L1 and the L2 levels of the

foreign language distributional requirement. Similarly, a course designated L3–L4 satisfies both the L3 and the L4 levels.

Not all of the languages offered in Yale College are offered at all levels, and it may not be possible to fulfill the language requirement in some of them. Languages currently offered in Yale College are Akkadian, Arabic, Bengali, Bosnian-Croatian-Serbian, Chinese, Czech, Dutch, hieroglyphic Egyptian, French, German, ancient Greek, modern Greek, biblical Hebrew, modern Hebrew, Hindi, Indonesian, isiZulu, Italian, Japanese, Khmer, Kiswahili, Korean, Latin, Persian, Polish, Portuguese, Romanian, Russian, Sanskrit, Sinhala, Spanish, Tamil, Tibetan, Turkish, Ukrainian, Vietnamese, and Yorùbá. Students wishing to fulfill the foreign language requirement in a less commonly taught language should consult the director of undergraduate studies in the relevant department to verify that the appropriate level of study will be offered. Students who have intermediate- or higher-level proficiency in a language other than those listed here (including American Sign Language) should consult the appropriate director of undergraduate studies or the director of the Center for Language Study to arrange for a placement examination.

Students who, for medical reasons, are not able to complete the language requirement may petition the Committee on Honors and Academic Standing for a partial waiver of the requirement. In granting such a waiver, the committee will normally require that a student complete four course credits in the study of a specific non-English-speaking culture.

4. **Courses taken on the Credit/D/Fail basis** A student may not apply any course credit earned on the Credit/D/Fail basis toward satisfaction of the distributional requirements for the junior year nor for the distributional requirements for the bachelor's degree.
5. **Independent study courses** A student may not apply any course credit earned through independent study courses toward satisfaction of any of the distributional requirements.
6. **Acceleration credits** Acceleration credits may not be employed to satisfy the distributional requirements for the bachelor's degree, nor may they be employed to meet the distributional requirements for the freshman, sophomore, or junior years.
7. **Course credit earned at Yale before matriculation** Course credit earned at Yale before a student's matriculation, either at Yale Summer Session or in the Nondegree Students program while the student was enrolled as a secondary school student in the New Haven area, may be applied to the distributional requirements for the bachelor's degree and to those for the sophomore and junior years, but it may not be applied to the distributional requirements for the freshman year.
8. **Courses in the graduate and professional schools** It is the expectation that Yale College students, including candidates for the simultaneous award of the bachelor's and master's degrees, will fulfill their distributional requirements in courses taken in Yale College. Credit earned in a course offered in the Graduate School of Arts and Sciences or in one of the professional schools of the University may be applied toward the distributional requirements only if the course instructor has secured, in advance of the term in which the course will be given, approval from Yale College.

Instructors interested in making such an advance arrangement can contact the Dean of Academic Affairs to be directed to the appropriate authority for such approval.

9. **Course credit from outside Yale** Course credit earned at another university may be applied toward the distributional requirements for the bachelor's degree and to those for the sophomore and junior years whether or not it is counted toward the 36-course-credit requirement for graduation. Credit from outside Yale may not be applied toward the distributional requirements for the freshman year. See section O, Credit from Other Universities (p. 79). Note particularly that Yale does not award course credit or distributional credit for courses completed at another college or university before the student graduated from secondary school.
10. **Major programs** Courses taken in fulfillment of a student's major requirements maybe applied toward satisfaction of the distributional requirements for the freshman, sophomore, and junior years and toward the distributional requirements for the bachelor's degree.
11. **Permission for a partial waiver of the distributional requirements for the freshman year** If, with the permission of the residential college dean, a freshman enrolls in a program of study for the first two terms of enrollment worth more than nine course credits, the dean may waive the year limit on the number of course credits that a student may elect in a single department or disciplinary area. Under no circumstances may a student be promoted to sophomore standing without having enrolled for at least one course credit in two skills categories (foreign language, quantitative reasoning, writing).
12. **Permission to postpone fulfillment of the distributional requirements for the sophomore year** A student may petition the Committee on Honors and Academic Standing for permission to fulfill the distributional requirements for the sophomore year in the fifth term of enrollment. Such a petition must be filed no later than the date of midterm of the fourth term of enrollment; it should explain the sound academic reasons why these requirements cannot be satisfied within four terms of enrollment and give an exact description of how they shall be fulfilled in the fifth term. Students who have not fulfilled the distributional requirements for the sophomore year by the end of the fourth term of enrollment and who have not been granted permission by the Committee on Honors and Academic Standing to postpone their fulfillment will normally not be promoted to junior standing.
13. **Permission to postpone fulfillment of the distributional requirements for the junior year** In exceptional circumstances, a student may petition the Committee on Honors and Academic Standing for permission to fulfill the distributional requirements for the junior year in the seventh term of enrollment. Such a petition, which must include the written support of the residential college dean and, where applicable, that of the director of undergraduate studies in the student's major, should be filed no later than the date on which the student's course schedule is due in the sixth term of enrollment; in no case will a petition be accepted later than the date of midterm in the sixth term of enrollment. It should explain the sound academic reasons why these requirements cannot be satisfied within six terms of enrollment and give an exact description of how they shall be fulfilled in the seventh term. Students who have not fulfilled the distributional requirements for the junior year by the end of the sixth term of enrollment and who have not

been granted permission by the Committee on Honors and Academic Standing to postpone their fulfillment will normally not be promoted to senior standing.

## MAJOR REQUIREMENTS

The requirements of the various major programs are given under the heading for each department or program. Every major program includes a senior requirement, which may take the form of a senior essay, a senior project, or a senior departmental examination.

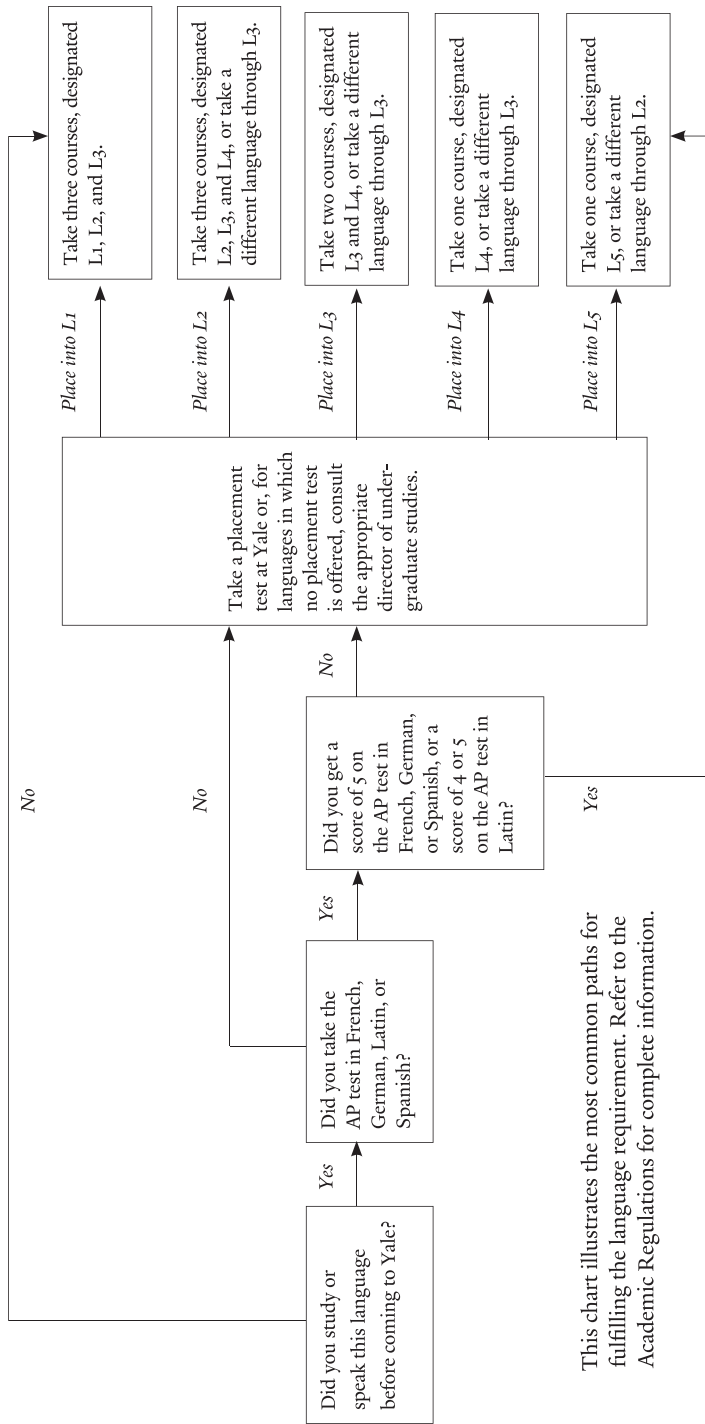
## EIGHT TERMS OF ENROLLMENT

A student must complete the requirements for the bachelor's degree in no more than eight terms of enrollment. Terms spent on a Year or Term Abroad, or in the Yale College program at the Paul Mellon Centre in London during a spring term, are considered the equivalent of terms of enrollment in Yale College. Note, however, that course credits earned in terms spent on a Year or Term Abroad may not be applied to acceleration by the early accumulation of thirty-six course credits all earned at Yale. See section P, Acceleration Policies (p. 82). (Attendance at the summer program at the Paul Mellon Centre in London or Yale Summer Session does not constitute a term of enrollment in Yale College.)

In exceptional circumstances, a student may petition the Yale College Committee on Honors and Academic Standing for permission to enroll for an additional term. Such a petition should be made no later than the beginning of a student's seventh term of enrollment; it should describe precisely, giving detailed information on specific courses, why it is impossible for the student to complete the requirements for a bachelor's degree within eight terms; and it should be accompanied by detailed, informative letters of endorsement from the student's director of undergraduate studies and residential college dean. The Committee on Honors and Academic Standing cannot grant permission for a ninth term in order for a student to undertake an optional arrangement not necessary for the acquisition of a bachelor's degree, such as, for example, the completion of two majors, or enrollment in the Program for the Simultaneous Award of the Bachelor's and Master's Degrees, or completion of the entrance requirements for graduate or professional school. A student given permission to enroll for a ninth term is not eligible for scholarship assistance from Yale, although other forms of financial aid may be available. See "Financial Aid Regulations" in the Yale College online publication *Undergraduate Regulations*.

Graduation in fewer than eight terms of enrollment is possible: see section P, Acceleration Policies (p. 82). Under no circumstances may a student graduate in fewer than six terms of enrollment, unless the student was admitted by transfer from another college or university. Transfer students should consult section L, Transfer Students (p. 73).

COMMON PATHS TOWARD FULFILLMENT OF THE LANGUAGE REQUIREMENT



This chart illustrates the most common paths for fulfilling the language requirement. Refer to the Academic Regulations for complete information.



## B. Grades

### LETTER GRADES

The letter grades in Yale College are as follows:

A	Excellent	B+		C+		D+		F	Fail
A-		B	Good	C	Satisfactory	D	Passing		
		B-		C-		D-			

### CREDIT/D/FAIL OPTION

In order to encourage academic exploration and to promote diversity in students' programs, the Yale College Faculty has provided that students may elect a certain number of courses on a Credit/D/Fail basis.

1. **Reporting of grades** In all courses (except for a few professional school courses), instructors report letter grades for all students. If the student has chosen the Credit/D/Fail option in a course, the registrar converts grades of A, A-, B+, B, B-, C+, C, and C- into the notation CR, which is entered on the student's transcript. Grades of D+, D, D-, and F are entered on the transcript as reported. A student may not be required to disclose to the instructor of a course whether the student has enrolled in the course for a letter grade or under the Credit/D/Fail option.
2. **Eligibility** All courses offered in Yale College during the fall and spring terms are available for election under the Credit/D/Fail option. Courses in Yale Summer Session may not be taken under the Credit/D/Fail option.
3. **Total number of courses** A student may offer as many as four course credits earned on the Credit/D/Fail basis toward the bachelor's degree.
4. **Number of courses in a term** As many as two credits may be elected under the Credit/D/Fail option in a term; thus in an academic year a student may earn as many as four credits on the Credit/D/Fail option. In each term, a student must elect at least two courses, representing at least two course credits, for letter grades.
5. **Distributional requirements** A student may not apply any course credit earned on the Credit/D/Fail basis toward satisfaction of the distributional requirements for the junior year nor toward satisfaction of the distributional requirements for the bachelor's degree.
6. **Requirements of the major** The program description of each major specifies whether or not courses taken on the Credit/D/Fail basis count toward the requirements of that major.
7. **Credit/year course sequences** A credit/year course sequence may be taken under the Credit/D/Fail option for one term while the other term of the yearlong sequence is taken for a letter grade. For credit/year course sequences in which a student receives a separate letter grade for each of the two terms, each term will be governed by the enrollment option the student elected for that term. For credit/year course sequences in which a student receives the mark of SAT or NSAT for the first term and a letter grade for the second, the enrollment option that the student elects for the second term governs both terms of the course sequence; that is, students will receive either the mark of CR for both terms or a letter grade for both terms, depending on the option elected for the second term.

8. **Course schedules** Students must indicate on their course schedules at the beginning of a term the use they wish to make during that term of the Credit/D/Fail option. As indicated above, in a given term a student may elect as many as (but no more than) two course credits on the Credit/D/Fail basis; and a student must elect at least two courses, representing at least two course credits, for letter grades. If a student indicates on the course schedule more than two course credits being taken on the Credit/D/Fail option, the registrar will record only the first two of them, in the order in which they are listed, as being taken on that basis, and the student will not be permitted to take the others on the Credit/D/Fail option.
9. **Late course schedules** Because a decision to employ the Credit/D/Fail option in a course must be declared at the beginning of the term on the student's course schedule, and because conversion from a letter grade to the Credit/D/Fail option is not possible for students who submit their schedules on time, a student who submits the schedule after the date on which it is due may not employ the Credit/D/Fail option in any course during that term. See "Enrollment in Courses" in section E. The only exception to this rule may be in the case of a student who for some valid and extraordinary reason cannot submit the course schedule on time and who has the permission of the residential college dean and the registrar to submit it late. If the college dean approves, such a student may employ the Credit/D/Fail option only by submitting to the college dean by the date on which the course schedule is due—as published in the Yale College Calendar with Pertinent Deadlines (p. 8)—a written statement specifying the course (or courses) that the student wishes to take on the Credit/D/Fail basis.
10. **Registration withheld** In order to employ the Credit/D/Fail option, students whose registration is being withheld by the Office of Student Financial Services or any other administrative office of the University must submit their schedules on time, before the deadline indicated on the student's course schedule and listed in the Yale College Calendar with Pertinent Deadlines (p. 8).
11. **Conversion to a letter grade** Until the Friday three weeks before the end of each term, as published in the Yale College Calendar with Pertinent Deadlines (p. 8), a student who has elected a course on the Credit/D/Fail basis may choose to receive a letter grade in that course by filing the appropriate form in the office of the residential college dean. After the deadline such conversion is not possible. If a student converts from the Credit/D/Fail option to a letter grade before the deadline, the option may not again be resumed even if the student desires to do so before the deadline.
12. **Conversion from a letter grade to Credit/D/Fail** A course once elected for a letter grade may not subsequently be converted to a course taken on the Credit/D/Fail basis.
13. **Courses selected after the deadline** A student who for any reason has been granted extraordinary permission by the Committee on Honors and Academic Standing to elect a new course after the deadline for submitting a course schedule may not employ the Credit/D/Fail option in that course. A change of level in courses in which the subject is taught in an ordered progression is not considered the election of a new course.
14. **Acceleration credit** Work completed under the Credit/D/Fail option cannot yield acceleration credit.

15. **Prizes and honors** Marks of CR are included in the calculations for some prizes, for Distinction in the Major, and for election to Phi Beta Kappa as non-A grades, but marks of CR are not included in the calculation for General Honors. See under Honors (p. 30) in the Yale Curriculum section.
16. **Courses in the graduate and professional schools** Courses in the Graduate School of Arts and Sciences and in the professional schools of the University are not available on the Yale College Credit/D/Fail option. Some courses in certain professional schools of the University are, however, graded on a Pass/Fail basis only, and grades for undergraduates in these courses are recorded as CR or F. Such credits are counted in the total earned on the Credit/D/Fail basis that a student is permitted to offer in a term as well as the total offered toward the requirements of a bachelor's degree. Marks of CR in professional school courses are included in the calculations for Distinction in the Major as non-A grades. Marks of CR in professional school courses are not included in the calculation for General Honors. See "General Honors" and "Distinction in the Major" under Honors (p. 30) in the Yale Curriculum section.

## INDEPENDENT STUDY COURSES

Independent study courses, other than senior essays or projects and other exempted courses as explained below, are graded on a Pass ("P")/Fail ("F") basis with the additional requirement that the instructor of record submit a substantive report that both describes the nature of the independent study and evaluates the student's performance in it. These reports will be shared with the student and the director of undergraduate studies in the department or program in which the course is offered, and kept in the office of the student's residential college dean.

Senior projects and courses deemed by a department or program to be a constituent of the senior requirement will continue to be evaluated with a letter grade. Additionally, the department or program offering a particular independent study course may deem that such a course should be exempted from pass/fail grading for a particular student because the course meets an important requirement in the major. In such a case, the director of undergraduate studies in the department or program that is offering the course may petition the Committee on Honors and Academic Standing to permit the student's work in the course to be evaluated with a letter grade. Such a petition should be filed by the date on which the student's schedule is due in the term in which the student is enrolling in the course and should provide sound academic reasons for the exception. In no case will such a petition be accepted later than the date of midterm in the term in which the course is being taken.

## GENERAL REGULATIONS CONCERNING GRADES AND TRANSCRIPTS

1. **Record of courses** A transcript is the record of courses in which a student has enrolled during the student's progress in completing the requirements of the bachelor's degree. All grades, passing and failing, thus appear on the transcript and are counted in the calculation of grade point average (GPA). These include passing grades earned in the first term of a credit/year course sequence in which the second term is not completed, even though such grades do not count toward the 36-course-credit requirement for graduation. If a student remains in a course after

the date of midterm, the student is considered to have been enrolled in that course; therefore, if a student withdraws from the course after midterm and before the first day of the reading period, the mark W (for Withdrew) appears on the transcript in association with the course. See paragraph 5 below.

2. **Equal value of courses** Passing grades contribute equally, to the extent to which they carry course credit, toward the 36-course-credit requirement for graduation. A grade of D in a course, for example, does not need to be balanced with a higher grade in some other course.
3. **Change of a grade** A grade, once submitted by the instructor of a course to the registrar, may not be changed except by vote of the Yale College Committee on Honors and Academic Standing on petition of the instructor, unless it is the result of a clerical error made in the instructor's computation or in transcription of a grade.
4. **Withdrawal from courses before midterm** If a student has elected a course on the course schedule but formally withdraws from it before midterm, as published in the Yale College Calendar with Pertinent Deadlines (p. 8), the student's transcript will contain no indication of that course after the withdrawal has been recorded by the registrar. See section F, Withdrawal from Courses (p. 49).
5. **Withdrawal from courses after midterm** If a student enrolled in a course formally withdraws from it after midterm but before the first day of the reading period, the student's transcript will record the designation W (Withdrew) for the course. In credit/year course sequences in which a student receives the mark of SAT or NSAT for the first term and a letter grade for the second, a student who completes the first term but does not subsequently enroll in the second term, or who subsequently withdraws from the second term before midterm, will have the designation W (Withdrew) recorded for the first term of the sequence.

The mark of W is a neutral designation indicating simply that the student has been enrolled in, but has withdrawn from, a course; while the course obviously carries no credit toward the degree, the W implies no evaluation of a student's work and carries no implication whatsoever of failure. Withdrawal from a course after the last day of classes, as published in the Yale College Calendar with Pertinent Deadlines (p. 8), is not possible. See section F, Withdrawal from Courses (p. 49).

6. **Incomplete work and postponed final examinations** A student who has received permission for a mark of Temporary Incomplete in a course, or who has been authorized to take a makeup final examination in a course, is allowed the specified period of time to repair the deficiency in the course. If the deficiency is not repaired by a satisfactory performance within the stipulated time, then the designation TI (Authorized Temporary Incomplete) or ABX (Authorized Absence from Final Examination) is automatically converted by the registrar to the grade of F. See "Postponement of Final Examinations" and "Work Incomplete at the End of Term" in section H (p. 53).
7. **Withdrawal from Yale College** Whether a student withdraws from Yale College for personal, medical, academic, or disciplinary reasons, the entry placed in each case on the student's transcript is the word "Withdrew" together with the date of the withdrawal.
8. **Tracks and programs within majors** A transcript may show as a student's major subject only a designation approved for that purpose by the Yale College Faculty;

“tracks” or programs within majors may not appear on transcripts. The majors approved by the faculty are listed under Majors in Yale College (p. 88).

9. **Distribution of grade reports** At registration each year, a student is given the opportunity to declare whether his or her grades may be released to certain other parties. If the student gives permission for grades to be released to a guardian or to parents, after each term of that year the University Registrar’s Office will send a grade report to them. If a student gives permission for grades to be released to a secondary school or Alumni Schools Committee, grade reports will be furnished to them only upon specific request of the school or the committee. Upon written request of the student, the University Registrar’s Office will also send a copy of the grade report to any additional person or agency designated by the student.
10. **Early access to grade report** Early access to recorded grades is available online to students in any Yale College course for which they have completed or actively declined to complete the online course evaluation form through the Yale University Student Information Systems.
11. **Transcript orders** Transcripts may be ordered either at Student Financial Services, 246 Church Street, or through the Web site of the University Registrar’s Office (<http://www.yale.edu/sfas/registrar>). The charge is \$7 per transcript. Each fall the registrar provides in each student’s registration packet, free of charge, an unofficial copy of the student’s academic record to date. This record may serve as a convenient aid in discussions with the student’s adviser of the student’s academic plans during the coming year.

## C. Course Credits and Course Loads

### CREDIT VALUE OF COURSES

Most courses in Yale College are term courses that carry one course credit if completed with a passing grade. There are, however, some variations:

1. **Double-credit courses** A few courses in Yale College, including intensive language or research courses, award two course credits for a single term’s work.
2. **Yearlong course sequences** There are a few yearlong course sequences in which two course credits are awarded upon the satisfactory completion of both terms of the sequence; other course sequences, including some research and laboratory courses, give one or four course credits for the successful completion of the full year’s work. A student who fails the first term of a yearlong course sequence may be permitted to continue the sequence only with the instructor’s written permission, and will receive course credit only for the successful completion of the second term’s work. A student who satisfactorily completes the first term of a yearlong course sequence may receive course credit routinely for that term’s work, except where noted otherwise in the course listing.

Note that completion of a modern foreign language course numbered 110 does not award credit unless and until the subsequent term, numbered 120, is also successfully completed. Except in intensive, double-credit courses in which the equivalent of one year of language study is covered in one term, credit may not be given in any circumstance for the first term only of an introductory modern foreign language; neither instructors nor departments have the authority to make

an exception to this rule. With some exceptions, credit will be given for successful completion of the second term only of an introductory modern foreign language, or for the first term only or the second term only of an intermediate modern foreign language.

3. **Laboratory courses** Some laboratory courses carry no separate credit toward the degree; others carry a full course credit for a term's work; and still others carry one-half course credit.
4. **Half-credit courses** All courses that carry 0.5 or 1.5 course credits and that are not bound by the credit/year restriction count toward the 36-course-credit requirement for the bachelor's degree.

## NORMAL PROGRAM OF STUDY

A student in Yale College normally takes four or five term courses, or their equivalent, for each of eight terms.

1. **Minimum course load** A student may not enroll in a program of study worth fewer than three course credits in one term. A student enrolled for three course credits may withdraw from one course credit between midterm and the first day of the reading period, receiving the neutral designation W (Withdraw) in that course. Similarly, a student enrolled for four or more course credits may withdraw from one or more courses as described above, but at no time may any student carry a schedule of courses that will earn fewer than two course credits in a term.
2. **Course loads requiring permission** A three-course-credit program of study or a six-course-credit program of study requires the permission of the residential college dean. It is assumed that any student who requests permission to carry more than five course credits does not intend to drop any of them. Permission for a program of six course credits will normally not be given to a student who is not in academic good standing.
3. **Seven course credits in a term** A student must petition the Yale College Committee on Honors and Academic Standing for permission to take a program worth seven credits in a term. In the petition the student must explicitly state an intention to complete all the courses proposed.
4. **Independent study** Opportunities for independent study exist in many programs and departments under various designations: directed reading or research, individual reading or research, independent research or study, independent or special projects, individual instruction in music performance, independent, individual, or special tutorials, and the senior essay or project, among others. Note that course credit earned in such study may not be used toward fulfillment of the distributional requirements. Approval for any such particular course is given by the department or program; however, approval for an independent study course is also required from the Yale College Committee on Honors and Academic Standing if certain limits are exceeded. A student must petition the committee for permission to enroll in more than one such course credit in any one term before the senior year or in more than two such course credits in any one term during the senior year. Permission is also required for a student to enroll in more than three such course credits in the first six terms of enrollment; included in this total are any independent study courses completed in Yale Summer Session that are applied to the Yale College transcript. In the petition the student must give sound academic

reasons for exceeding these limits and provide evidence that the additional work in independent study will not be done at the expense of the breadth and depth of study being pursued in regular Yale College courses.

## D. Promotion and Good Standing

### REQUIREMENTS FOR PROMOTION

1. To be promoted to sophomore standing after two terms of enrollment, a student must have earned at least eight course credits or the equivalent and have fulfilled the distributional requirements for the freshman year.
2. To be promoted to junior standing after four terms of enrollment, a student must have earned at least sixteen course credits or the equivalent and is expected to have fulfilled the distributional requirements for the sophomore year.
3. To be promoted to senior standing after six terms of enrollment, a student must have earned at least twenty-six course credits or the equivalent and is expected to have fulfilled the distributional requirements for the junior year.

### REQUIREMENTS FOR ACADEMIC GOOD STANDING

At the conclusion of each term of enrollment, a student must have earned enough course credits to be in academic good standing.

1. At the end of the first term at Yale, a student must have earned at least four course credits.
2. At the end of the second term, a student must have earned at least eight course credits.
3. At the end of the third term, a student must have earned at least twelve course credits.
4. At the end of the fourth term, a student must have earned at least sixteen course credits.
5. At the end of the fifth term, a student must have earned at least twenty-one course credits.
6. At the end of the sixth term, a student must have earned at least twenty-six course credits.
7. At the end of the seventh term, a student must have earned at least thirty-one course credits.

Regardless of the number of credits accumulated, a student is not in academic good standing if the student's record shows three grades of F in a term or over two or three successive terms. "Successive terms" means successive terms in which the student enrolls, whether or not broken by a withdrawal or by a leave of absence. See "Dismissal for Academic Reasons" and "Makeup of Course Deficiencies for Promotion or Academic Good Standing" in section I (p. 56).

## E. Registration and Enrollment in Courses

### REGISTRATION

Every student is required to register at the beginning of each term in which he or she is to be enrolled in courses at Yale College.

1. **Fall-term registration** To register for the fall term, all freshmen must attend a registration meeting with their residential college dean and freshman counselor on the Friday before classes begin, as published in the Yale College Calendar with Pertinent Deadlines (p. 8). Upperclassmen must attend the registration meeting conducted by the office of the residential college dean on the day before classes begin, as published in the Yale College Calendar with Pertinent Deadlines (p. 8). Students whose registration is being temporarily withheld by the Office of Student Financial Services or by any other administrative office of the University are nonetheless required to attend the appropriate registration meeting.
2. **Spring-term registration** To register for the spring term, freshmen are required to attend a registration meeting in their residential college on the day before classes begin, as specified in the Yale College Calendar with Pertinent Deadlines (p. 8). Sophomores, juniors, and seniors are required to pick up registration materials from the office of the residential college dean on the first day of classes, as specified in the Yale College Calendar with Pertinent Deadlines (p. 8). Students whose registration is being temporarily withheld by an administrative office of the University are nonetheless required to report for spring-term registration as given immediately above.
3. **Late registration** A student who, for reasons other than incapacitating illness, the death of a family member, or a comparable emergency, fails to follow the registration procedures in paragraph 1 or 2 above may register for the term only by exceptional action of the Committee on Honors and Academic Standing and will be liable to a fine of \$50.

### ENROLLMENT IN COURSES

Enrollment in courses can be accomplished only by the submission of an approved course schedule or, in amendment of the course schedule, by the submission of an approved course change notice. Attendance at a class does not constitute enrollment. The course schedule is an important document. A student is responsible for the timely submission of the course schedule and for the accuracy of all the information that the student enters upon it. The course elections that a student indicates on a course schedule or course change notice shall appear on the student's transcript unless a student formally withdraws from a course before midterm. See section F, Withdrawal from Courses (p. 49).

The following rules govern students' enrollment in courses during the fall and spring terms of the academic year:

1. **Deadline for submitting schedules** Every student must submit a course schedule for each term at the office of the residential college dean by 5 p.m. on the deadline indicated on the student's course schedule and listed in the Yale College Calendar with Pertinent Deadlines (p. 8). Students whose registration has been withheld by



the Office of Student Financial Services or any other administrative office of the University must nonetheless submit their course schedules by these same deadlines.

It is the student's responsibility to obtain all necessary signatures, except that of the residential college dean, before the schedule is due. In the rare instance that the student's adviser is unavailable before the deadline, the student should nonetheless submit the schedule on time, and take a copy to be signed by the adviser and submitted to the dean as soon as possible. If the student does not submit a copy of the schedule signed by the adviser within one week of the deadline, the student will be subject to the fines and restrictions described under paragraphs 3 and 4 below.

2. **Addition of a new course after the deadline** The election of a new course after the deadline for submitting a course schedule will not be permitted save by exceptional action of the Committee on Honors and Academic Standing. Students who seek such an exception should consult immediately with the residential college dean. Permission to elect a new course must be requested by a petition that is accompanied by the written approval of the course instructor and the submission of a course change notice at the office of the residential college dean. The petition should explain in detail why the course is necessary to the student's schedule and why the student was unable to elect the course during the course selection period. Timeliness is an essential feature of any request to add a course to the course schedule; a delay in consulting with the dean or in submitting a complete petition will normally be grounds for denial. A fee of \$20 will be charged for the processing of an approved course change notice on which the election of a new course is requested. A student may not elect a new course after midterm, as published in the Yale College Calendar with Pertinent Deadlines (p. 8), unless such election is made to correct a clerical error on the course schedule. A change of level in courses in which the subject is taught in an ordered progression, as for example in languages or in mathematics, is not considered the addition of a new course. Such a change may be made with the approval of the instructors involved (and, if necessary, with the added permission of the director of undergraduate studies in the subject). Similarly, a change of section in the same course is not considered the addition of a new course.
3. **Fines for late schedules** Students who submit their schedules after the deadlines will be fined at least \$50. Additional fines, increased \$5 daily according to lateness, will be imposed for schedules submitted more than one week after the deadlines. A schedule received more than two weeks after it is due will be accepted only by exceptional action of the Committee on Honors and Academic Standing and will be subject to an increased fine or other penalty.
4. **Credit/D/Fail option** A student who submits a course schedule after the date on which it is due may not employ the Credit/D/Fail option in any course during that term. See "Credit/D/Fail Option" in section B (p. 39), paragraph 9.
5. **Fines for clerical errors** A student who submits a course schedule or course change notice with clerical errors or omissions of data is liable to a fine of \$50.
6. **Overlapping meeting times** A student may not elect courses with meeting times that overlap. If, for good cause, a student is obliged to elect two courses with a small and insignificant overlap in meeting times, the student must supply the residential college dean with the written permission of both instructors at the beginning of the term and must petition the Committee on Honors and Academic Standing,

explaining why the student must enroll in both courses in the current term and how the student will meet all the requirements for both courses. Failure to file a complete and timely petition may result in the loss of credit for both courses.

7. **Courses requiring permission** Some courses require permission of the instructor to enroll; others require permission of the director of undergraduate studies. It is the responsibility of the student to secure the appropriate permission before enrolling in a course. If a student enters a course on the course schedule without the appropriate permission, the instructor may direct the registrar to drop the student from the class.
8. **Courses that do not require permission** Courses that do not require permission for enrollment may nevertheless be limited in their enrollment (i.e., “capped”) at the beginning of the term, depending upon, for example, the number of teaching assistants available, the size of the appropriate meeting space, or other instructional needs.
9. **Prerequisites** Students are expected to have met the prerequisites published in course descriptions. If a student wishes to elect a course for which prerequisites are indicated but has not met those prerequisites, it is the student’s responsibility to secure the permission of the instructor and, where appropriate, the director of undergraduate studies before enrolling. The registrar may drop the student from the class if the student has not met the prerequisites for enrollment.
10. **Teaching evaluations** For the advancement of teaching in Yale College, anonymous teaching evaluations are made available through the Yale University Student Information Systems. Students are expected to participate in this evaluation process for any Yale College course in which they are enrolled. Students who withdraw from a course after midterm are invited but not required to participate.
11. **Selection of a less advanced course in the same subject** In certain subjects, such as mathematics, foreign languages, and the sciences, knowledge of the subject is acquired in an ordered progression. That is, the concepts and skills introduced in one course are necessary, or prerequisite, for mastery of the material in subsequent courses in that field. Occasionally a student, having completed an intermediate or advanced course in a subject, may take a less advanced one in that same subject. In such a case, although the student obviously cannot receive course credit for both courses, each course will appear on the student’s transcript with the grades earned; however, the student will receive course credit only for the more advanced course. A student may sometimes be permitted to complete an intermediate or advanced course without having first completed a less advanced course in a subject; in such a case, the student does not receive course credit for the less advanced course by virtue of having completed the more advanced course.
12. **Repeated enrollment in the same course** Courses may not be repeated for credit, except for courses marked “May be taken more than once” or “May be repeated for credit.” In such cases, the repeated course earns no additional distributional credit. On some rare occasions, a student may take the same course over again, or may take a course with the same content as another course the student has already passed. In such cases, the student receives credit for the course only once. Should a student take the same or an equivalent course twice, each course with its grade appears on the transcript. The student receives course credit for the higher grade if one is earned; in such an event, course credit is not given for the lower grade. Note,

however, that both grades are included in the calculation of a student's grade point average (GPA) and in the calculation for General Honors.

13. **Placement in foreign language courses** Students placed by a language program or by their score on the Advanced Placement examination into a particular level of a foreign language may not earn course credit for the completion of a course in that language at a level lower than the placement. For example, a student placed into the third term (L3) of a foreign language earns no course credit for the completion of an L1 or L2 course in that language. Should a student complete a foreign language course at a level lower than the placement, the lower-level course with its grade appears on the transcript but earns no credit toward graduation.
14. **Use of vertebrate animals** If the satisfactory completion of a course will require the use of vertebrate animals in experiments, the student must be notified of that requirement at the first meeting of the course. If a student objects on ethical grounds to participating in the animal usage in question, it is the student's responsibility to discuss the matter with the faculty member in charge and not to enroll in the course if no alternative acceptable to the faculty member can be arranged.
15. **Field trips** If the satisfactory completion of a course will require participation in a field trip, students should understand that there are inherent risks, including the risks of travel, involved in such an activity. If a student objects to assuming these risks, it is the student's responsibility to discuss the matter with the faculty member in charge and not to enroll in the course if no alternative acceptable to the faculty member can be arranged. Yale College's policies regarding field trips can be found at the Yale College Academic Field Trip Policies Web site (<http://yalecollege.yale.edu/content/academic-field-trip-policies>).

## F. Withdrawal from Courses

Students are permitted to withdraw from courses for which they have enrolled in a term until 5 p.m. on the last day of classes before the reading period in that term. Withdrawal from a course can be accomplished only by the submission of a course change notice at the office of the residential college dean. A fee of \$20 will be charged for the processing of an approved course change notice on which withdrawal from a course is requested. Formal withdrawal is important, because failure to receive credit for courses in which students are enrolled will be recorded as F on their transcripts and may open them to the penalties described under "Academic Warning" and "Dismissal for Academic Reasons" in section I (p. 56).

1. **Transcripts** Each course listed on a student's course schedule appears on the student's transcript unless the student withdraws from the course by midterm. See paragraph 3 below.
2. **Permission** All course withdrawals require the permission of the residential college dean.
3. **Withdrawal before midterm** If a student formally withdraws from a course by midterm, as published in the Yale College Calendar with Pertinent Deadlines, then after the registrar has recorded the withdrawal, the transcript will contain no indication of that course.

4. **Withdrawal after midterm** If a student formally withdraws from a course after midterm but before 5 p.m. on the last day of classes before the reading period, the transcript will record the course and show the neutral designation W (Withdraw) for the course. The deadlines for such withdrawals are published in the Yale College Calendar with Pertinent Deadlines. The deadlines apply to all courses, whether or not a particular course observes the reading period.

A change of level in courses in which the subject is taught in an ordered progression, as, for example, in foreign languages or in mathematics, is not considered a course withdrawal and does not result in the recording of a W.

5. **Withdrawal after the deadlines** After these deadlines, withdrawal from a course is not permitted. An exception will be made only for a student who withdraws from Yale College for medical reasons as certified by Yale Health after the beginning of the reading period but by the last day of the final examination period; in such a case the student will be permitted to withdraw from a course with a mark of W.
6. **Withdrawal from a credit/year sequence** For those credit/year course sequences in which a student receives the mark of SAT or NSAT for the first term and a letter grade for the second, withdrawal from the sequence after the first term is completed but before the second term is completed will result in the recording of a mark of W for the first term.
7. **Lack of formal withdrawal** If, when grades are due, the instructor of a course notifies the registrar that a student has not successfully completed a course from which the student has not formally withdrawn, then a grade of F will be recorded for that course on the student's transcript. See "General Regulations concerning Grades and Transcripts" in section B (p. 39). See also "Work Incomplete at the End of Term" and "Postponement of Final Examinations" in section H (p. 53).
8. **Withdrawal from Yale College** A student who has withdrawn from Yale College for any reason, including medical, is no longer enrolled. Consequently, as of the date of the withdrawal, such a student cannot continue to attend classes or complete work that was assigned in the term in which the withdrawal occurred, even if the deadline for such assignments was previously extended by the instructor or by the residential college dean.
9. **Transcripts of students withdrawn from Yale College** It follows that if a student withdraws from Yale College by midterm, the transcript will not show that the student has been enrolled in any course during that term. If a student withdraws from Yale College after midterm, but before 5 p.m. on the last day of classes before the reading period, the transcript will record the student's courses with the designation W (Withdraw). If a student withdraws from Yale College after the beginning of the reading period, the transcript will show the student's courses with grades of F unless an instructor reports a passing grade for the student in any of the courses. The only exception is for a student who withdraws from Yale College for medical reasons after the beginning of the reading period but before the end of the term; see paragraph 5 above.

## G. Reading Period and Final Examination Period

1. **Due dates for course work** It is expected that instructors will require all course assignments, other than term papers and term projects, to be submitted at the latest

by the last day of reading period. Term papers and term projects are to be submitted at the latest by the last day of the final examination period. For the dates of the reading period and final examination period, consult the Yale College Calendar with Pertinent Deadlines. Instructors do not have the authority to give permission for these deadlines to be extended; only the residential college dean has this authority. See “Work Incomplete at the End of Term” in section H (p. 53). Even if an extended deadline should be announced by the instructor, a grade reflecting work submitted after the end of the term cannot be accepted unless a Temporary Incomplete was authorized by the student’s residential college dean.

2. **Reading period** The Yale College Faculty established the reading period between the end of classes and the beginning of final examinations in order to provide a period of about a week during which students might conclude their course work and prepare for final examinations. The instructor of each course determines whether or not that course observes the reading period. A course that does not observe the reading period is identified in the course listings by the abbreviation “RP” at the end of the course description or by a phrase such as “Meets RP” or “Meets during reading period.”

The assumption underlying the faculty’s institution of the reading period was that no additional assignments would be required during the reading period in a course observing it, but that students would use the reading period in their own way to consolidate and augment the work of the course. Such being the case, no final examination may be administered during the reading period. A final examination in a course, whether or not the course observes the reading period, must be administered during the final examination period. No take-home final examination may be due during the reading period. An instructor may, however, set the due date for a term paper or project as late as the last day of the reading period.

3. **Final examinations** Yale College expects every course to conclude with a regular final examination or with a substitute for such an examination. The substitute should be in the nature of a final examination in that it requires the student to demonstrate proficiency in the discipline and subject matter of the course. Substitutes may include, for example, an oral presentation or examination, a term essay due at the latest before the beginning of the final examination period, or the last of a series of hour tests administered during the last week of classes. Final examinations normally last either two or three hours but, in either case, students are permitted to take an additional half-hour before being required to turn in their answers. This additional time is given for improving what has already been written, rather than for breaking new ground.
4. **Scheduling of final examinations** The University Registrar’s Office has assigned a specific time and date for the administration of final examinations in most courses in Yale College. The time of the final examination is determined by the meeting time of a course during the term. If the meeting time of a course is changed from that originally published, the time of the examination is defined by the new meeting time. If a course is published with no scheduled examination but the instructor subsequently decides to offer a final examination, it must be administered at the time defined by the meeting time of the course. A schedule of final examinations may be found on the page Final Examination Schedules (p. 13).

5. **Date of administering final examinations** Since the final examination schedule has been carefully designed to make efficient use of the entire final examination period and to minimize overcrowding of students' schedules, a final examination must be administered on the date and at the time specified. On occasion instructors have administered final examinations at times different from those assigned. Such an arrangement is allowed under the following conditions: (a) that two different and distinct final examinations be administered; (b) that one of these examinations be administered at the regularly specified time within the final examination period; (c) that the alternative examination be administered at a regular examination starting time during the final examination period; and (d) that no student be required to obtain permission to take the alternative examination.
6. **Take-home final examinations** Take-home final examinations are sometimes substituted for regular final examinations. If a course has been assigned a final examination date, a take-home examination for that course is due on the scheduled examination day. If a course has not been assigned a final examination date, a take-home examination for the course is due on the day specified in the final examination schedule by the meeting time of the course. See Final Examination Schedules (p. 13). If a course does not meet at a time covered by the final examination schedule, a take-home examination may not be due during the first three days of the final examination period. No take-home examination may be due during the reading period.
7. **Due dates for term grades** An instructor is required to submit term grades promptly after the completion of a course. Fall-term grades are due by 5 p.m. on January 2, 2014; spring-term grades are due within one week of the end of the final examination period; grades for seniors in the spring term are due within forty-eight hours of the end of the final examination period.

In submitting term grades, the instructor is expected to apply appropriate penalties for missed or incomplete work unless the late submission of the work has been authorized by the student's residential college dean or by the Committee on Honors and Academic Standing. If an instructor reports a mark of Incomplete for which there has been no authorization by the college dean, the Incomplete will be recorded by the University Registrar's Office as a grade of F.

8. **An hour test at the end of term instead of a final examination** Some instructors do not give final examinations of the usual two-and-one-half-hour or three-and-one-half-hour length, but instead terminate their courses with an hour test that is the last in a succession of hour tests administered during the term.

For courses that do not observe the reading period, this hour test may be administered during the reading period, since, in such courses, regular class meetings are scheduled to extend through the reading period. A course that does not observe the reading period may also administer the hour test during the final examination period at the time specified in the final examination schedule.

For courses that do observe the reading period, the hour test may not be administered during the reading period, but may be administered only during the last week of classes or during the final examination period at the time specified in the final examination schedule.

9. **Senior departmental examinations** In those major programs requiring a senior departmental examination, that examination is scheduled on the two weekdays preceding the final examination period in the fall and spring terms. In a department or program in which a two-day written senior departmental examination is administered on those days, a senior may, with the written consent of the appropriate instructors, be excused from final examinations in as many as two courses in the major in the term in which he or she takes the departmental examination. In a department or program in which the senior departmental examination takes place on only one of the two scheduled days, a senior may, with the written consent of the instructor, be excused from the final examination in one course in the major in the term in which the departmental examination is taken. If the senior departmental examination takes place before the scheduled days, or if a senior essay or senior project takes the place of the examination, a student may not omit a final examination.

## H. Completion of Course Work

### SUBMISSION OF COURSE WORK TO INSTRUCTORS

Students in Yale College are expected to take personal responsibility for the timely delivery to their instructors of all course work, including examinations, in the manner and format prescribed by the instructors. It is generally expected that the student will submit course work in person, either to the instructor or to a person explicitly designated by the instructor, such as a teaching fellow or an administrative assistant. Students who submit course work in a manner other than in person, directly to an appropriate individual (e.g., place it under a door or in a box in a hallway), do so at their own risk. Students who must use postal services to submit a course assignment, because they will be unavoidably absent from campus at the time an assignment is due, should ascertain in advance from the instructor the correct mailing address and use receipted mail services to establish the date of mailing.

Instructors are not required to accept course work sent over a computer network to their computer, printer, or e-mail account unless they have explicitly authorized such electronic submission in the syllabus for the course or have made a special arrangement with the student. Instructors may establish a deadline for electronic submission of a particular assignment different from the deadline for submission of the same assignment on paper.

### LATE OR POSTPONED WORK

There are three kinds of late or postponed work: (1) work late during term time; (2) work incomplete at the end of term; and (3) postponed final examinations. Instructors of courses may, during term time, give permission to make up late or missed work, provided that such work is submitted before the end of term. Only the residential college dean, however, may authorize the late submission of work still incomplete at the end of term, or the postponement of a final examination.

When students know in advance that they must miss or postpone work for a legitimate reason, as described below in “Work Missed during the Term” and in “Postponement of Final Examinations,” they should inform the instructor and the residential college dean as soon as possible.

## WORK MISSED DURING THE TERM

The basic responsibility for permitting postponement of work during the term is the instructor's. However, the residential college dean may give permission for a student to make up work missed or delayed during the term because of an incapacitating illness, the death of a family member, or a comparable emergency. The residential college dean also has authority to give permission to make up work missed because of the observance of religious holy days and because of participation required in intercollegiate varsity athletic events. Only in these cases does a residential college dean have authority to give permission to make up late work during term time. This permission is conveyed by means of a special form from the college dean that the student delivers to the instructor. Students participating in events of intramural or club sports, as differentiated from varsity events sponsored by the Department of Athletics, are not eligible for a postponement of work by the dean on account of those events.

In all other cases of work missed during the term, permission to make up course work must be secured directly from the instructor of the course, since the instructor is the only person who can decide, in the context of the nature and requirements of the course, whether such permission is appropriate. This permission may not, however, extend beyond the end of the term. Permission to submit work still incomplete at the end of term may be granted only by a student's residential college dean. See "Work Incomplete at the End of Term."

## WORK INCOMPLETE AT THE END OF TERM

Only the residential college dean has authority to give permission to a student to submit work in a course after the end of term. The college dean may give such permission because of an incapacitating illness, because of a serious family emergency, or because of another matter of comparable moment. In such cases the college dean may authorize a mark of Temporary Incomplete for a period not to exceed one month from the beginning of the final examination period. Note that the mark of Temporary Incomplete refers to unfinished course work, not to a final examination missed for any reason; see "Postponement of Final Examinations."

The residential college dean, in authorizing a mark of Temporary Incomplete, will stipulate the date on which the student's late work will be due and the date on which the instructor is expected to submit a course grade to the registrar. The college dean may not set this second date later than one month after the beginning of the final examination period. If the student's work has not been completed in time for the instructor to report a grade to the registrar by the deadline stipulated, then the instructor will submit a grade for the student that reflects the absence of the missing work, or the registrar will convert the mark of Temporary Incomplete to a grade of F. See "General Regulations concerning Grades and Transcripts" in section B (p. 39), and section F, Withdrawal from Courses (p. 49).

Permission for a mark of Temporary Incomplete to last beyond one month from the beginning of the final examination period can be granted only by the Yale College Committee on Honors and Academic Standing. Such an extension may be given only for a brief period of time, usually one to two weeks, and only in response to extraordinary circumstances, usually of a medical nature. A petition for such permission must be submitted at the earliest possible date. In considering such requests, the



Committee on Honors and Academic Standing takes into account the original deadline for submission of the work and the date on which a petition is delivered to the committee.

## USE OF COMPUTERS AND POSTPONEMENT OF WORK

Problems that may arise from the use of computers, software, and printers normally are not considered legitimate reasons for the postponement of work. A student who uses computers is responsible for operating them properly and completing work on time. (It is expected that a student will exercise reasonable prudence to safeguard materials, including saving data on removable disks at frequent intervals and making duplicate copies of work files.) Any computer work should be completed well in advance of the deadline in order to avoid last-minute technical problems as well as delays caused by heavy demand on shared computer resources in Yale College.

## POSTPONEMENT OF FINAL EXAMINATIONS

Only the residential college dean may authorize postponement of a final examination. The residential college dean may give such permission because of an incapacitating illness, because of a family emergency requiring the student's absence from New Haven, or because of another matter of comparable moment. The residential college dean may also authorize such a postponement because of the observance of religious holy days, or because of participation required in an intercollegiate varsity athletic event. Students participating in events of intramural or club sports, as differentiated from varsity events sponsored by the Department of Athletics, are not eligible for a postponement of final examinations on account of those events. Finally, the college dean may authorize postponement of a final examination if a student has three examinations scheduled during the first two days of the final examination period, or three examinations scheduled consecutively in the final examination schedules.\* The postponement of a final examination for any other reason requires the permission of the Committee on Honors and Academic Standing. A student's end-of-term travel plans are not a basis for the postponement of a final examination. See Final Examination Schedules (p. 13) and paragraph 4 in section G, Reading Period and Final Examination Period (p. 50).

\* The final examination schedules indicate three examination sessions, or time slots, per day: one in the morning, one in the afternoon, and one in the evening. Some of these time slots contain examinations; others do not. A college dean may postpone an examination if a student has three examinations scheduled within any four consecutive time slots, whether or not each of those time slots has an examination assigned to it. See Final Examination Schedules (p. 13). Occasionally an instructor may arrange an option for an alternative final examination in addition to the regularly scheduled examination. See paragraph 5 in section G, Reading Period and Final Examination Period (p. 50). Such an optional arrangement cannot be the basis for a postponement of an examination if three of a student's final examinations would thereby acquire "consecutive" status.

It is normally the expectation that when a student begins a final examination but does not complete it, the student will receive credit only for the work completed on the examination. If, however, a student becomes unable to complete an examination because of a sudden and serious illness or other emergency during the examination, the

student may request authorization from the residential college dean to take a makeup final examination. In such a case, the student must explain his or her departure to the instructor, or to some other person proctoring the examination, before leaving the room, and must contact Yale Health or the residential college dean as soon as possible thereafter.

Makeup examinations for the fall term are scheduled to take place at the end of the second week of classes in the spring term. Makeup examinations for underclassmen who miss final examinations in the spring term are scheduled at the end of the second week of classes in the following fall term. Makeup final examinations are administered by the University Registrar's Office only at these times. Students who will not be enrolled at these times—whether because they are on leave of absence or on a Year or Term Abroad, or because they have withdrawn from Yale—must make alternative arrangements with the University Registrar's Office in advance of the dates on which makeup final examinations are administered by that office. The registrar automatically records a grade of F in a course for a student who fails to take an officially scheduled makeup examination in that course at the appointed time. If an examination is not administered by the registrar, it is the student's responsibility to make arrangements with the instructor to take the makeup examination. In such cases, if a grade is not received by the midterm following the original examination date, the registrar automatically records a grade of F in the course.

No fee will be charged for a makeup examination necessitated by illness, family emergency, the observance of a religious holy day, or participation required in an intercollegiate varsity athletic event. A charge of \$35 will be made for the administration of a makeup examination occasioned by a conflict between two final examinations scheduled at the same time, or three examinations scheduled in the first two days of the examination period, or three final examinations scheduled in consecutive examination periods. Ordinarily there will be a charge of \$35 for makeup examinations authorized for special reasons approved by the Committee on Honors and Academic Standing.

Permission to postpone a final examination does not also carry authorization for a student to submit other work late in that course. See "Work Incomplete at the End of Term."

## I. Academic Penalties and Restrictions

### CUT RESTRICTION

Regular classroom attendance is expected of all students. While Yale College enforces no general regulation concerning attendance, instructors of individual courses may require it of all students. This is particularly the case in discussion groups, seminars, laboratories, and courses in foreign languages.

A student who, in the opinion of the instructor and of the residential college dean, has been absent from a course to an excessive degree and without excuse may at any time be placed on Cut Restriction in that course or in all courses. A student on Cut Restriction who continues to be absent from a course may, with the concurrence of the college dean and the Committee on Honors and Academic Standing, be excluded from it without credit. See "Exclusion from Courses."

## EXCLUSION FROM COURSES

Any student may, because of excessive absences or unsatisfactory work, be excluded from a course without credit at any time upon recommendation, made by the instructor or department concerned, to the residential college dean and the Committee on Honors and Academic Standing. If the exclusion occurs after midterm and before the first day of the reading period, the student's record will show a mark of W for the course.

## ACADEMIC WARNING

Academic Warning is an indication that a student's scholastic record is unsatisfactory. Students on Academic Warning who do not pass all of their courses in the term in which they are on Academic Warning will be dismissed for academic reasons. No matter how many course credits a student has earned, Academic Warning is automatic in the following cases: (a) failure in one term to earn more than two course credits; (b) a record that shows two grades of F in one term; (c) in two successive terms, a record that shows a grade of F for any course. The college deans attempt to give written notification of Academic Warning to students whose records show these deficiencies, but such students should regard themselves as being on warning even in the absence of written notification. A student permitted to continue in Yale College with fewer than the number of course credits ordinarily required for academic good standing may be placed on Academic Warning, and in such a case the student will be notified that he or she has been placed on warning. See "Requirements for Academic Good Standing" in section D, Promotion and Good Standing (p. 45). The Committee on Honors and Academic Standing may at its discretion disqualify a student on Academic Warning from participation in recognized University organizations.

## DISMISSAL FOR ACADEMIC REASONS

1. **Failure in three classes** A record that shows three grades of F in a term or over two or three successive terms will normally result in the student's dismissal from Yale College. "Successive terms" means successive terms in which the student enrolls, whether or not broken by a withdrawal or by a leave of absence.
2. **Failure to meet requirements for good standing or promotion** A student who has not, at the end of a term, met the minimum requirements for academic good standing, or a student who has failed to meet the minimum standards for promotion, may be dismissed unless permitted by the Committee on Honors and Academic Standing to repair the deficiency. See "Makeup of Course Deficiencies for Promotion or Academic Good Standing" below and section D, Promotion and Good Standing. (p. 45) A student who is short by more than two credits of the minimum requirements for academic good standing or promotion, even if the student has no grades of F, will be dismissed.
3. **Students on Academic Warning** A record that shows a grade of F for a student who is on Academic Warning in that term will result in that student's dismissal for academic reasons. See "Academic Warning."
4. **Readmitted students** A student readmitted to Yale College who does not, in the first or second term following readmission, pass all the courses completed in that term will be dismissed for academic reasons. See "Readmission" in section J (p. 58).

In addition, at any point during the year a student may be dismissed from Yale College if in the judgment of the Yale College Committee on Honors and Academic Standing the student's academic record is unsatisfactory.

## MAKEUP OF COURSE DEFICIENCIES FOR PROMOTION OR ACADEMIC GOOD STANDING

A student who has failed to satisfy the requirements for promotion or for academic good standing, if permitted to continue by the Committee on Honors and Academic Standing, must repair the deficiency promptly. Such deficiencies are to be repaired before the opening of the next fall term by work in summer school. The institution to be attended and the courses to be taken require the approval of the residential college dean. See section O, Credit from Other Universities (p. 79). Only in extraordinary circumstances will a student be allowed to repair a deficiency by carrying an additional course during the following academic year. Course deficiencies may not be repaired under any circumstances by the application of acceleration credits.

## J. Leave of Absence, Withdrawal, and Readmission

### LEAVE OF ABSENCE

Any student in Yale College who is in academic good standing will normally receive permission, upon petition to the Committee on Honors and Academic Standing through the residential college dean, to take one or two terms of leave of absence, provided that the student departs in academic good standing at the end of a term and returns at the beginning of a term. See “Requirements for Academic Good Standing” in section D (p. 45). In order that the University may make plans to maintain enrollment at the established level, students desiring leaves of absence are requested to make their intentions known to their residential college deans as soon as possible. Yale College assumes that students who take leaves of absence will inform their parents or guardians in good time that they intend to do so. Ordinarily, residential college deans do not notify parents or guardians that a student has taken a leave of absence, though they may do so if they believe that such notification is appropriate.

1. **Petition for a fall-term leave** For a fall-term leave of absence, a student is requested to submit a petition by May 1. Since a student's plans often change during the summer, however, the Committee on Honors and Academic Standing will ordinarily grant a petition for a leave that is received on or before the tenth day of the term in the fall.
2. **Petition for a spring-term leave** For a spring-term leave of absence, a student's petition must be received on or before the tenth day of the term in the spring.
3. **Relinquishing housing** Students considering a leave of absence should be aware that there is a substantial financial penalty for relinquishing on-campus housing after the relevant deadlines for relinquishing such housing. See “Rebates of Undergraduate Charges” in the section “Financial Regulations” in the Yale College online publication *Undergraduate Regulations*.
4. **Canceling a leave** A student may cancel a leave of absence for either term as late as the first day of classes in the term for which the leave has been requested. However,

the deadlines for payment of the term bill and the penalties for late payment apply in such cases. See “Payment of Bills” in the section “Financial Regulations” in the *Undergraduate Regulations*.

5. **Total terms of leave** A student is eligible for a total of two terms of leave of absence. These two terms need not be taken consecutively.
6. **Accelerated students** A student taking an accelerated degree by use of acceleration credits who has had two terms of leave of absence may receive a third term of leave if the third term of leave is needed to bring the student’s pattern of attendance into conformity with the pattern of attendance stipulated for an accelerated degree. See section P, Acceleration Policies (p. 82).
7. **Returning from a leave** Permission to take a leave of absence normally includes the right to return, with prior notification to the residential college dean but without further application, at the beginning of the term specified in the student’s petition to the Committee on Honors and Academic Standing. In the case, however, in which a student achieved eligibility for a leave of absence because of a postponement of a deadline for course work as a result of an identified medical problem, the Yale College Dean’s Office may require medical clearance from Yale Health before the student’s return from the leave of absence. Such clearance may also be required for a student who had sought and had been granted, on medical grounds, a waiver of the fee for the late relinquishment of housing at the time the leave of absence was requested.
8. **Financial aid** Students taking leaves of absence who have received long-term loans will be sent information about their loan repayment obligations, which in most cases begin six months after the last day of formal enrollment at Yale. A student taking a leave of absence who is receiving financial aid through Yale must consult with a counselor in the Student Financial Services Center before leaving Yale; see “Rebates of Undergraduate Charges” in the section “Financial Regulations” in the *Undergraduate Regulations*.
9. **Health coverage** A student on a leave of absence is eligible to retain coverage by Yale Health during the time of the leave, but the student must take the initiative to apply for continued membership in Yale Health by completing an application form and paying the fee for membership. See “Leave of Absence” in the section “Health Services” in the *Undergraduate Regulations*. Application forms and details about medical coverage while on leave of absence may be obtained from the Member Services Department of Yale Health.

## MEDICAL WITHDRAWAL

A withdrawal for medical reasons must be authorized by the director of Yale Health or the chief of the Mental Health and Counseling department, or by their official designees within the Health Center. If a student under the care of a non-Yale Health physician wishes to withdraw for medical reasons, that physician should submit sufficient medical history to the director of Yale Health for a final decision on the recommendation. A student planning to return to Yale should discuss the requirements for readmission with the residential college dean or the chair of the Committee on Readmission.

Yale College reserves the right to require a student to withdraw for medical reasons when, on recommendation of the director of Yale Health or the chief of the Mental

Health and Counseling department, the dean of Yale College determines that the student is a danger to self or others because of a serious medical problem, or that the student has refused to cooperate with efforts deemed necessary by Yale Health to determine if the student is such a danger. An appeal of such a withdrawal must be made in writing to the dean of Yale College no later than seven days from the date of withdrawal.

### WITHDRAWAL FOR PERSONAL REASONS

At any time during the year, a student may withdraw from Yale College for personal reasons. After consulting with the residential college dean, a student wishing to withdraw should write a letter of resignation to the college dean. In consulting with the college dean, a student planning to return to Yale should discuss the requirements for readmission. Also, students in academic good standing who fail to register in a term will be withdrawn for personal reasons.

A student who withdraws from Yale College for personal reasons rather than face disciplinary charges that are pending against that student will not be eligible for Yale College readmission, re-enrollment, or a Yale College degree, and a notation to this effect will be entered on the transcript.

### REBATES OF UNDERGRADUATE CHARGES

For information on financial rebates on account of withdrawal from Yale College, consult the section “Financial Regulations” in the *Undergraduate Regulations*.

### READMISSION

During the time that a student who has withdrawn is away from Yale College, the Committee on Readmission expects him or her to have been constructively occupied and to have maintained a satisfactory standard of conduct.

Students whose withdrawal was for either academic reasons or personal reasons must remain away for at least one fall term and one spring term, in either order, not including the term in which the withdrawal occurred. (Note that students who withdrew for personal reasons rather than face disciplinary charges that are pending against them are not eligible for readmission; see above under “Withdrawal for Personal Reasons.”) Students whose withdrawal had been authorized as medical by the director of Yale Health must normally remain away at least one full term before a return to Yale College, not including the term in which the withdrawal occurred. The period of withdrawal for disciplinary reasons is set by the Yale College Executive Committee at the time the student’s enrollment is suspended.

Further requirements depend to some extent on the circumstances of the withdrawal and its duration. Students who are not in academic good standing, i.e., students who withdrew while a term was in progress or who were dismissed for academic reasons, must ordinarily complete the equivalent of at least two term courses, either in Yale Summer Session or at another college or university, earning grades of A or B. See section I, Academic Penalties and Restrictions (p. 56). Courses conducted on line, whether taken at Yale Summer Session or elsewhere, do not fulfill this readmission requirement. In general, such a record of course work is also required of students who withdrew for medical reasons and of any students who have been away from full-time academic work for two years or more, whether or not they were in academic good

standing at the time of their departure, in order to demonstrate that upon return they can satisfactorily complete their academic program. Courses themselves, as well as the institution at which they are taken, should be cleared in advance with the chair of the Committee on Readmission or the applicant's residential college dean. In some cases, the Committee on Readmission may require more than two courses or courses in a specific subject area. All such course work must be completed no later than the opening of the term to which the student has applied to be readmitted, but no earlier than two years before the date that term begins. Courses completed in fulfillment of readmission that are eligible for graduation credit must be applied to the student's Yale College transcript.

Interviews with members of the committee are required of all applicants. The committee cannot approve a student's return to Yale College until after the necessary interviews have taken place. These may include meetings for any applicant with the chair of the committee, the applicant's residential college dean, and any other member of the committee, including a member of the Yale Health staff. Interviews are normally conducted just prior to the beginning of the term to which the student is seeking readmission.

As an integral part of the application for readmission, students who withdrew for medical reasons must obtain a recommendation from Yale Health. Such a recommendation must come from either the director of Yale Health or the chief of the Mental Health and Counseling department, or from their official designees within the Health Center; no such recommendation can be made in the absence of documentation provided to Yale Health that the student has had successful treatment from an appropriate health clinician.

Inquiries about readmission should be directed to the chair of the Committee on Readmission, Yale College Dean's Office, 110 SSS, Yale University, P.O. Box 208241, New Haven, CT 06520-8241. The first inquiry about readmission to a fall term should come no later than the previous April 30, and applications must be submitted in person or by receipted mail by June 1. The first inquiry concerning readmission to a spring term should come no later than the previous September 30, and applications must be submitted in person or by receipted mail by November 1. These deadlines are strictly enforced.

While the majority of students who apply for readmission do return to Yale College, readmission is not guaranteed to any applicant. Since the committee seeks to readmit only those students who have demonstrated the ability henceforth to remain in academic good standing and thus complete degree requirements within the specific number of terms of enrollment remaining to them, the committee may sometimes advise an applicant to defer his or her return until a time later than the one originally proposed.

Students who are readmitted to Yale College are expected to be complete and passing in all their courses at the conclusion of each of the two terms following their readmission. A student who fails to meet this condition is ordinarily required to withdraw after his or her record has been reviewed by the Committee on Honors and Academic Standing. A student is eligible to be readmitted only once; a second readmission may be considered only under unusual circumstances, ordinarily of a medical nature.

For additional information about readmission to Yale College, consult the Web page Readmission to Yale College (<http://yalecollege.yale.edu/content/readmission-yale-college>).

### **U.S. MILITARY SERVICE READMISSION POLICY**

Students who interrupt their studies to perform U.S. military service are subject to a separate U.S. military leave readmission policy.

In the event a student withdraws or takes a leave of absence from Yale College on or after August 14, 2008, in order to serve in the U.S. military, the student will be entitled to guaranteed readmission under the following conditions:

1. The student must have served in the U.S. Armed Forces for a period of more than thirty consecutive days.
2. The student must give advance written or verbal notice of such service to his or her residential college dean. In providing the advance notice the student does not need to indicate whether he or she intends to return. This advance notice need not come directly from the student, but rather, can be made by an appropriate officer of the U.S. Armed Forces or official of the U.S. Department of Defense. Notice is not required if precluded by military necessity. In all cases, this requirement of giving notice can be fulfilled at the time the student seeks readmission, by submitting an attestation that the student performed the service.
3. The student must not be away from the University to perform U.S. military service for a period exceeding five years (this includes all previous absences to perform U.S. military service but does not include any initial period of obligated service). If a student's time away from the University to perform U.S. military service exceeds five years because the student is unable to obtain release orders through no fault of the student or the student was ordered to or retained on active duty, the student should contact his or her residential college dean to determine if the student remains eligible for guaranteed readmission.
4. The student must notify Yale within three years of the end of the U.S. military service of his or her intention to return. However, a student who is hospitalized or recovering from an illness or injury incurred in or aggravated during the U.S. military service has up until two years after recovering from the illness or injury to notify Yale of his or her intent to return.
5. The student cannot have received a dishonorable or bad conduct discharge or have been sentenced in a court-martial.

A student who meets all of these conditions will be readmitted for the following term unless the student requests, in writing, a later date of readmission. Any student who fails to meet one of these requirements may still be eligible for readmission under Yale's general readmission policy but is not guaranteed readmission. Upon returning to Yale, the student will resume his or her education without repeating completed course work for courses interrupted by U.S. military service. The student will have the same enrolled status last held and will be in the same academic standing. For the first academic year in which the student returns, the student will be charged the tuition and fees that would have been assessed for the academic year in which the student left the institution. Yale may charge up to the amount of tuition and fees other students are assessed, however, if veterans' education benefits will cover the difference between the amounts currently



charged other students and the amount charged for the academic year in which the student left. In the case of a student who is not prepared to resume his or her studies with the same enrollment status and academic standing as when he or she left or who will not be able to complete the program of study, Yale will undertake reasonable efforts to help the student become prepared. If, after reasonable efforts, Yale determines that the student remains unprepared or will be unable to complete the program, or Yale determines that there are no reasonable efforts it can take, Yale may deny the student readmission.

## K. Special Arrangements

### YEAR OR TERM ABROAD

In recognition of the value of international study, Yale College encourages students to spend a term or an academic year studying in an approved program abroad. In order to participate in a Year or Term Abroad, students must have the approval of the Yale College Committee on the Year or Term Abroad and have been accepted into an approved and accredited study-abroad program. Students in any major may apply. Please note that a term abroad may be taken only during the second term of the sophomore year or either the first or second term of the junior year, and that a year abroad may be taken only during the junior year. Within the limits of the eligibility requirements given below, other combinations of terms of study abroad may be permitted with the approval of the Committee on the Year or Term Abroad. Students are limited to a total of two terms abroad for full Yale credit and financial aid transfer. To be eligible, students must be in academic good standing as a junior or second-term sophomore, as appropriate, to begin an approved term or year abroad and be able to return to enrollment at Yale in academic good standing. See “Requirements for Academic Good Standing” in section D (p. 45). Students must also have at least a B average at the time of their application and demonstrate sufficient competence in the language of the host country to do university-level course work. In general, by the time that they go abroad students should have completed the relevant intermediate-level foreign language course (typically a course numbered 140 with an L4 designation) or have demonstrated the equivalent proficiency by examination. Study in an English-speaking country or participation in any other program abroad in which instruction is in English is permitted when the student articulates clear academic objectives for such a program. Applicants may petition the committee for an exception to eligibility requirements if they believe they have compelling reasons for the exception.

Application forms for a Year or Term Abroad are available on the Study Abroad Web site (<http://www.yale.edu/yalecollege/international/opportunities/type/study>) of the Center for International and Professional Experience. A complete application includes all of the following: the application form; an approval form from the student’s director(s) of undergraduate studies; an evaluation form from the student’s residential college dean; and a statement concerning the proposed course of study. Students on Yale financial aid must also submit a Year Abroad Budget for Financial Aid Applicants to the appropriate office. Approval from the Yale College Committee on the Year or Term Abroad is contingent upon the student’s acceptance into a program or university abroad. Students must provide a copy of their acceptance letter to the committee before departure.

Applications for permission to study abroad in the spring term of the academic year 2014–2015 are due on October 15, 2014. Applications for study in the fall term of the academic year 2015–2016 or for the full academic year 2015–2016 are due on March 5, 2015. Early applications that meet all requirements are reviewed on a rolling basis until the final deadline.

Applications for programs or universities abroad are available directly from the sponsoring institutions. Information about specific programs, including course descriptions, addresses and telephone numbers of the programs, and evaluations from past Yale participants, can be found at the Study Abroad office. Note that application deadlines differ from program to program and usually also differ from the Yale College committee's deadline. Students are responsible for meeting the deadlines set by the programs they seek to attend, whether those deadlines fall before or after the Yale College committee's deadline.

In selecting programs abroad in which to enroll, students should be aware that such programs vary in quality, and some may not be approved for a Year or Term Abroad. At a minimum, approved programs must involve full-time work at the university level and must be undertaken during the regular academic year at an institution outside the United States. Students should note that programs in the Southern Hemisphere are subject to a different academic calendar, one which extends into the months of June, July, and August. With this exception, summer terms do not qualify as part of a Year or Term Abroad.

A list of programs which have had the approval of the committee in the past and in which Yale students have participated with success is available on the Study Abroad Web site (<http://www.yale.edu/yalecollege/international/opportunities/type/study>) of the Center for International and Professional Experience. Students applying to enroll in programs not previously reviewed or approved by the committee may be required to furnish informational literature about the program, course syllabi, or a letter of support from a Yale faculty member familiar with the program. The committee evaluates programs primarily on the quality and structure of their academic offerings. Study abroad advisers are available in the Center for International and Professional Experience to assist students in selecting an appropriate program.

1. **Course credits** Students on a Year Abroad who complete a full program of study for the equivalent of two terms of enrollment at Yale may earn up to nine course credits. Students on a Term Abroad who complete a full program of study for the equivalent of one term of enrollment at Yale may earn up to four course credits. What the committee considers a full program of study varies from program to program. Students should consult with the Study Abroad office to ensure that they are enrolled in a full program abroad.

Usually, if the student has consulted with the director of undergraduate studies and a Study Abroad adviser before going abroad, the award of credit upon return from a Year or Term Abroad is routine.

2. **Course credit from outside Yale** Enrollment in the Year or Term Abroad program is the only arrangement by which students may offer more than two outside credits toward the thirty-six course credits required for the bachelor's degree.\* Students receiving credit for a Year Abroad may not apply any other credits from outside Yale toward the 36-course-credit requirement. Students receiving credit for a Term

Abroad may apply up to two other course credits from outside Yale toward the 36-course-credit requirement.

3. **Evidence of course work** To be awarded credit toward degree requirements, students must submit to the committee such evidence of their achievement as transcripts or other official academic records, wherever possible. Students should also be prepared to provide on their return to Yale copies of all course work, syllabi, and letters from instructors describing the nature and quality of their work.
4. **Grades** No credit will be awarded for a course in which the grade earned was lower than a C or its equivalent in other grading scales. Nor will credit be awarded for a course taken on a Pass/Fail option, if the student had the choice of taking the course for a letter grade.
5. **Distributional requirements and major requirements** In addition to applying credits earned on a Year or Term Abroad toward the 36-course-credit requirement, students may, with appropriate permissions, apply these course credits toward fulfillment of distributional requirements and some of the requirements of their major programs. Petitions for credit toward the distributional requirements should be directed to the director of study abroad; petitions for credit toward major requirements should be directed to the relevant director of undergraduate studies.
6. **Academic regulations** Because a Year or Term Abroad counts as the equivalent of one or two terms of enrollment in Yale College, the academic regulations of Yale College pertain to enrollment abroad. Students must earn a sufficient number of credits abroad to remain in academic good standing. Failure to do so will result in academic warning or dismissal for academic reasons. See section I (p. 56), Academic Penalties and Restrictions. Withdrawal from an approved program abroad has the same consequences as withdrawal from Yale College.
7. **Canceling a Year or Term Abroad** Students who have received permission to study abroad but later decide not to do so must notify their residential college dean in writing of their change of plans and then either enroll as usual in Yale College or apply for a leave of absence before the deadline. See section J (p. 58), Leave of Absence, Withdrawal, and Readmission. Students should also notify the Study Abroad office. In some cases, such students will have to withdraw from Yale College if the deadline for requesting a leave has passed, or they have already taken two terms of leave, or the deadline for enrolling in courses in Yale College has passed. Under no circumstances can a Year or Term Abroad be converted retroactively to a leave of absence. Similarly, a leave of absence cannot be converted retroactively to a Year or Term Abroad.
8. **Enrollment in Yale College after a Year or Term Abroad** After returning from a Year or Term Abroad, students must enroll in Yale College for at least two terms. Students who have accelerated should speak with their residential college dean about the possible need to decelerate. See section P (p. 82), Acceleration Policies (p. 82).
9. **Financial aid** Students who have been approved by the committee to study abroad and who receive financial aid from Yale are eligible for aid while abroad. For information about financial aid support, consult a counselor in the Student Financial Services Center, 246 Church Street, 432-2700.

- \* Study during the academic year at the Paul Mellon Centre in London (Yale-in-London) is equivalent to enrollment in Yale College and is not considered a Term Abroad. Application to the Yale-in-London program should be made directly to that office at the Yale Center for British Art. For details, see the British Studies program description (p. 173).

## COMPLETION OF DEGREE REQUIREMENTS AT THE END OF A FALL TERM

Students who at the end of a fall term complete the requirements for graduation may be of three kinds: (1) those who complete such requirements in eight terms of regular enrollment; (2) those who have accumulated thirty-six course credits or more, all earned at Yale, in fewer than eight terms of regular enrollment; and (3) students admitted by transfer to Yale College and students whose admission to Yale College was deferred until a spring term. Note that acceleration credits may not yield a completion of degree requirements at the end of a fall term; see section P, Acceleration Policies (p. 82). The following rules apply to students of these three kinds.

1. **Notification by the student** By the day on which the student's course schedule is due in the final term of enrollment, the student must notify the Committee on Honors and Academic Standing through the residential college dean that the fall term will be the student's last term of enrollment. Forms on which to make such notification are available in the offices of the college deans. Notification must include written certification from the student's director of undergraduate studies that the student will have completed all the requirements of the major program by the end of the fall term, and from the student's residential college dean that the student will have fulfilled the distributional requirements by that time. Failure to observe the deadline will result in the student's being charged a fine of \$100.
2. **Award of degrees and diplomas** Students who complete degree requirements at the end of a fall term are awarded their degrees and their diplomas at Commencement at the conclusion of the spring term of that academic year and are considered to be members of the class that graduates at that Commencement. General Honors and Distinction in the Major are also awarded at that time. If a student who completes degree requirements at the end of a fall term wishes to participate in the Commencement exercises held in the previous academic year, however, the student may do so with the permission of the residential college master and dean. Such might be the case, for example, of a student who because of a leave of absence did not qualify for graduation with the class in Yale College with which he or she entered as a freshman. Such a student would not receive the degree or diploma until the May of the academic year in which degree requirements were completed.
3. **Health coverage** A student whose last term of enrollment is a fall term is eligible, upon application and payment of a fee, for continued coverage by Yale Health during the subsequent spring term, just as if the student were on leave of absence for that term. Such coverage extends to August 31. See "Leave of Absence" in section J (p. 58).

## TWO MAJORS

A student must petition the Committee on Honors and Academic Standing for permission to complete the requirements of two major programs. Application forms are available from the residential college deans. A student contemplating the completion of two majors should bear in mind that doing so will almost invariably limit the opportunities for a wider distribution of studies over different subjects.

Each major must be completed independently of the other, with no more than two term courses overlapping. Prerequisites in either major are not considered to be overlapping courses. Other than such prerequisites, all courses taken in a major—including those taken in excess of the minimum requirements of the major—are counted in the consideration of overlapping courses unless such courses are in excess of the minimum requirements for both majors. Overlapping courses may not include the senior essay or senior project, unless the essay or project is unusually substantial and represents at least the equivalent of the minimum essay or project requirement of the one major in addition to the minimum essay or project requirement of the other major. If a single senior essay or project is approved for the two majors, no additional overlap in course credits is permitted.

It is not possible to offer as two majors a combined major with one of its component majors. For example, a major in Economics and Mathematics cannot be joined with a second major in either Economics or Mathematics. Similarly, a student completing a major that permits the inclusion of a concentration of courses from another major or program cannot also major in that second major or program. For example, a major in Sociology with Psychology cannot have a second major in Psychology. A Special Divisional Major may not be offered as one of two majors.

A petition for two majors should show clearly how the requirements for each of the two programs will be met, and should include the approval of the appropriate directors of undergraduate studies. The completion of two majors does not result in the award of two degrees; a student who completes a major that leads to the award of the B.A. degree and another major that leads to the award of the B.S. degree may choose the degree to be conferred. A petition to complete the requirements of two majors should be made only after the student's plans are definite, but no later than the due date for course schedules in the student's final term of enrollment. Petitions submitted after this deadline will be accepted only by exceptional action of the Committee on Honors and Academic Standing and will be fined \$50.

A student may not petition for permission to complete the requirements of more than two major programs.

## DOUBLE CREDIT FOR A SINGLE-CREDIT COURSE

Two course credits for a course in Yale College normally carrying one course credit may be awarded to a student under the following conditions:

1. **Deadline** Permission must be requested by midterm, as published in the Yale College Calendar with Pertinent Deadlines.
2. **Petition and approvals** The student's petition must be approved by the instructor of the course, the director of undergraduate studies in the instructor's department, and the Committee on Honors and Academic Standing. The petition should

include a detailed syllabus and an explanation of how the student's proposed work represents at least twice the normal expectations of the course.

3. **Distributional requirements** When a petition for double credit is approved for a course that fulfills a distributional requirement, the additional credit may not be applied toward the distributional requirement, although it may be applied toward the 36-course-credit requirement for graduation.
4. **Multiple courses** A student may make use of this arrangement rarely, no more than once or twice.

## SPECIAL TERM COURSES

With the approval of the Yale College Committee on Honors and Academic Standing, a student may arrange with a member of the faculty to take a Special Term Course, or individual tutorial, for credit toward the bachelor's degree, provided that certain requirements are met. First, the material of the proposed course must be appropriate to the qualifications of the student and it must be otherwise unavailable in the Yale University curriculum. If the subject can be pursued through independent study in an existing tutorial course in a department (e.g., HIST 494, PLSC 471 and 472), the student must apply for enrollment in that course through the director of undergraduate studies. Second, the instructor of the proposed special course must hold a teaching appointment in the University. Third, the student must describe in detail the nature of the proposed course work and submit a syllabus.

Requests for Special Term Courses should be made to the Committee on Honors and Academic Standing, 29A SSS, on forms available from the residential college deans. The application form must be completed by the student and then approved and signed by the proposed instructor and the director of undergraduate studies of the instructor's department. A request for a Special Term Course should be made during the term immediately preceding the term during which the course is actually to be taken. An application will not be accepted by the committee after the second week of the term for which a course is proposed. It is expected that Special Term Courses will be taken for a letter grade. A student may not apply credit earned in a Special Term Course toward satisfaction of any of the distributional requirements.

## LIMIT ON RESIDENTIAL COLLEGE SEMINARS

The number of residential college seminars is limited and the demand for them is great. A student may therefore take no more than four residential college seminars, and no more than two in a single term. Permission to exceed these limits must be secured in advance from the Yale College Committee on Honors and Academic Standing; such permission will be given only if the student can demonstrate that the integrity or coherence of the student's academic objectives would suffer without it.

## COURSES IN THE YALE GRADUATE AND PROFESSIONAL SCHOOLS

When a course is open to undergraduate as well as either graduate or professional school students, a Yale College student must enroll under the undergraduate number, unless already accepted into the program for the simultaneous award of the bachelor's and master's degrees.

A student may request to elect a graduate or professional school course, other than those designated independent study, by entering the course on the Course Schedule Selection Form and completing an additional form downloaded from the Web site of the University Registrar's Office (<http://www.yale.edu/sfas/registrar>). This latter form must be completed by the student, signed by the course instructor, and attached to a copy of the syllabus. For enrollment in a course in the Graduate School of Arts and Sciences, the form must also be signed by the director of graduate studies in the department in which the course is offered. For enrollment in a course in any of the professional schools of the University, the form must also be signed by the appropriate agent of the dean or the registrar of the school in which the course is offered.

Requests should be made as early as possible in the term in which enrollment is sought and not later than three weeks after the first day of Yale College classes of the term. In recognition of the need to have a student's schedule of courses finalized promptly, forms that are submitted after this date or that are incomplete will normally not be approved. Exceptions require action of the Committee on Honors and Academic Standing, in response to a petition from the student, and will be subject to a fine of at least \$50, with increases of \$5 daily according to lateness.

Note that systems for the award of course credit in the professional schools differ and that not all courses in these schools yield a full course credit in Yale College. Once all materials for a request to elect a professional school course are received by the Office of the University Registrar, a review will be made and the student will be informed as to whether the course will earn Yale College course credit and, if so, how much. Courses that earn no Yale College credit will normally not be entered on the Yale College transcript.

Note also that Yale College students are not permitted to enroll in independent study courses in the Graduate School of Arts and Sciences or in any of the professional schools of the University.

A student may offer toward the 36-course-credit requirement for the bachelor's degree as many as four course credits earned in professional schools of the University. Courses taken in the Graduate School of Arts and Sciences are not included in this four-credit restriction.

Courses in performance in the School of Music may be taken only after completion of MUSI 360, 361, 460, and 461, in the Department of Music. Performance courses in the School of Music may not be counted toward the 36-course-credit requirement for the bachelor's degree. Such courses will be included on the student's transcript, but must be offered in excess of the thirty-six credits required for graduation. For further information, see the section entitled "Individual Instruction in Performance" under Music. Nonperformance courses in the School of Music may be taken for credit without previous completion of MUSI 360, 361, 460, and 461; such courses are also included in the limit of four credits that may be earned in professional schools of the University.

The deadlines and regulations of Yale College are binding on all students, including candidates for the simultaneous award of the bachelor's and master's degrees, in regard to courses in which they are enrolled in the Graduate School of Arts and Sciences and the professional schools of the University. These include the deadlines and regulations pertaining to withdrawal from courses, late or postponed work, and work incomplete

at the end of term. An exception in deadline may be made in a course offered in a professional school of the University in which the academic calendar differs from that of Yale College. A request for such an exception must be grounded in compelling academic reasons, and must be made in writing by the instructor of the course to the student's residential college dean in advance of the deadline in question. Instructors of courses in the Graduate School and in the professional schools of the University are expected to use the Yale College grading system when they report grades for undergraduates who have completed their courses.

## SIMULTANEOUS AWARD OF THE BACHELOR'S AND MASTER'S DEGREES

Students of distinguished ability in a limited number of departments may undertake graduate work that will qualify them for the simultaneous award of the bachelor's and master's degrees at the end of their senior year. The simultaneous degree can be conferred only in a single department or program and only in departments or programs that confer both degrees. For example, a student may not complete a bachelor's degree in Economics and a master's degree in Political Science, nor may a student combine a bachelor's degree in a multi-departmental major (e.g., Ethics, Politics, and Economics) with a master's degree in one of its constituent departments. A student pursuing a simultaneous degree may, however, complete two separate undergraduate majors as long as one of the undergraduate majors is in the same department as the master's degree. Currently, the following departments offer the simultaneous degree option: Chemistry (p. 179); Classics (p. 192); Computer Science (p. 210); East Asian Studies (p. 231); Ecology and Evolutionary Biology (p. 239); History (p. 399); Linguistics (p. 469); Mathematics (p. 490); Molecular Biophysics and Biochemistry (p. 514); Molecular, Cellular, and Developmental Biology; and Political Science (p. 575). The director of the Program for the Simultaneous Award of the Bachelor's and Master's Degrees is Dean George Levesque.

1. **Eligibility** Applicants cannot be considered for admission unless by the end of their fifth term of enrollment they have achieved at least two-thirds A or A– grades in all of their course credits as well as in all of the course credits directly relating to their major. Some participating departments have additional eligibility requirements, and students should consult the relevant director of undergraduate studies for this information.

Prior to admission to the program, students enrolling in a course that carries both an undergraduate and a graduate number must do so under the undergraduate number. Students planning to apply to the program who enroll in such a course may request the permission of the instructor to complete the graduate-level requirements of the course and petition to have it converted to the graduate number on the academic record if they are subsequently admitted to the program. The petition, which is made to the director of the program, must be accompanied by certification that the course instructor has approved the student's proposal to complete the course at its graduate level.

2. **Application** Students must apply to their department for admission to the program through their director of undergraduate studies no later than the last day of classes in their fifth term of enrollment in Yale College. The proposal should provide evidence of eligibility, reasons for pursuing the simultaneous degree, and plans



for completing the program requirements. If the department acts favorably on the student's application, it is forwarded with the formal approval of the director of undergraduate studies and of the director of graduate studies to the Yale College Dean's Office, where a joint committee of Yale College and the Graduate School acts upon the department's nomination and notifies the student of acceptance into the program.

3. **Program requirements** Specific requirements for the award of degrees will be determined by each department. Normally a student is expected to complete the requirements of the undergraduate major in addition to eight or more courses in the Graduate School. For all students in the program, graduate work must not be entirely concentrated in the final two terms, and students in the program must take at least six term courses outside the department during their last four terms at Yale and at least two undergraduate courses during their last two terms.

Students may not enroll in Yale College for more than eight terms in order to qualify for the simultaneous award of both degrees. It is possible to earn both degrees in fewer than eight terms, but not by the use of acceleration credits. Upon acceptance into the program, a student who has accelerated by the use of acceleration credits will automatically be decelerated, and may not, so long as the student remains in the simultaneous degree program, subsequently employ the credits to accelerate.

4. **Requirements for the master's degree** To qualify for the master's degree, students must complete eight term course credits in the Graduate School with grades of A in at least two term courses (or in one year course) and with a B average in the remaining ones. Students in those departments with a language requirement for the Ph.D. degree will be required to demonstrate proficiency in one of the specified languages.
5. **Approval of course schedules** Following notification that they have been accepted into the Program for the Simultaneous Award of the Bachelor's and Master's Degrees, students must have their course schedules approved each term both by the director of undergraduate studies and by the director of graduate studies.

## COURSES IN YALE SUMMER SESSION

There is no limit on the number of courses in Yale Summer Session that a student may offer toward the requirements for the bachelor's degree.

Attendance at Yale Summer Session does not constitute a term of enrollment in Yale College. Thus a student accelerating by one term by use of acceleration credits may not offer attendance at Yale Summer Session as one of the required seven terms of enrollment in Yale College.

A student accelerating by the early accumulation of thirty-six course credits all earned at Yale may count credits earned in Yale Summer Session toward such acceleration. See "Acceleration by the Early Accumulation of Thirty-Six Course Credits All Earned at Yale" in section P (p. 82).

Courses successfully completed in Yale Summer Session may, with the permission of the student's director of undergraduate studies, be counted toward the requirements of the student's major program. They may also be counted toward any of the

distributional requirements. The Credit/D/Fail option may not be used in Summer Session courses. There are no auditing privileges in Yale Summer Session.

Unless the University Registrar's Office is instructed in writing to the contrary, courses completed in Yale Summer Session will be entered on the Yale College record. Once a course in Yale Summer Session has been entered on or removed from the Yale College transcript in response to a student's request, that action cannot subsequently be reversed by the student. When a Summer Session course is entered on a student's Yale College transcript, both the course and the grade are recorded; the course may not be recorded without the grade. If a Summer Session course is entered on the Yale College transcript, it will be included in the calculation of the student's eligibility for General Honors and Distinction in the Major. For further information about Summer Session courses and transcripts, refer to the Summer Session Web site (<http://summer.yale.edu>).

### YALE-IN-LONDON SUMMER PROGRAM

Courses in the summer program at the Paul Mellon Centre in London carry full Yale course credit, but enrollment in the Yale-in-London summer program does not constitute a term of enrollment in Yale College. (Attendance at the Yale College program at the Paul Mellon Centre in London during a spring term does count as a regular term of enrollment.) Thus a student accelerating by one term by use of acceleration credits may not offer attendance at the summer program at the Mellon Centre in London as one of the required seven terms of enrollment in Yale College.

A student accelerating by the early accumulation of thirty-six course credits all earned at Yale may count credits earned in the summer program at the Paul Mellon Centre in London toward such acceleration. See "Acceleration by the Early Accumulation of Thirty-Six Course Credits All Earned at Yale" in section P (p. 82).

### DIRECTED INDEPENDENT LANGUAGE STUDY

With the approval of the director of the Center for Language Study, a student may study a language not taught at Yale through the program in Directed Independent Language Study. Students may not apply to study a language being offered at the same time by Yale at the requested level. Students accepted into the program work on their own time, but on a schedule and with materials approved by the director of the Center for Language Study; they must meet regularly with a conversation partner; and they are tested at the end of the term in speaking, listening, reading, and writing. The director will approve only those proposals for which adequate materials, conversation partners, and testing can be arranged. Directed Independent Language Study does not earn Yale College course credit, nor does it appear on the transcript. Interested students should apply to the Center for Language Study.

### AUDITING

Auditors are not permitted in courses taught in Yale College except for persons in one of the categories described below.

1. Students enrolled full time in Yale College or in one of the graduate or professional schools of the University may audit courses without charge. The permission of the instructor is required.

2. Members of the Yale faculty and emeritus faculty may audit courses without charge. The permission of the instructor is required.
3. Spouses or partners of full-time Yale faculty members, or of emeritus faculty, or of students enrolled full time in the University may audit courses without charge. Permission is required of the instructor and of Dean William Whobrey.
4. Employees of the University and their spouses or partners may audit courses without charge in accordance with applicable personnel policies. Permission is required of the instructor, of the employee's supervisor, and of Dean William Whobrey.

No other persons are permitted to audit courses in Yale College except for those accepted through the Association of Yale Alumni Auditing program. The Alumni Auditing program is administered separately from the general auditing program, and different rules may apply. Information is available at the Yale Alumni Auditing Program Web site (<http://admissions.yale.edu/yale-alumni-auditing-program>).

Persons auditing courses with limited laboratory or computer facilities must secure the explicit permission of the instructor to do so, and should understand that regularly enrolled students must at all times have priority in using such facilities. Computer or language laboratory facilities should be employed by auditors only during times when they are not in heavy demand, and in certain courses charges for computer use may be necessary. General access to the campus computing network may not be available to auditors.

It is the usual expectation that an auditor does not take tests or examinations or write papers for a course for evaluation by the instructor. Occasionally, however, an auditor may wish to do such work and may request the instructor to evaluate it. If the instructor wishes to cooperate with the auditor in this way, the instructor does so on a voluntary basis and not as an obligation.

The University Registrar's Office does not keep a record of courses audited. It is not possible, therefore, for a student's transcript to show that a course has been audited, or for a transcript to be issued that records the auditing of a course.

Persons interested in auditing a course should visit the Yale College Special Programs Office, 55 Whitney Avenue, Suite 420.

## L. Transfer Students

The following regulations apply to students admitted to Yale College by transfer from other colleges and universities:

1. **Degree requirements** In order to graduate from Yale College, transfer students must fulfill all the requirements for the bachelor's degree. They must thus earn a total of the equivalent of at least thirty-six course credits, that total consisting of the number of credits awarded for their work at their previous institutions combined with the number of course credits subsequently earned at Yale. They must also complete the requirements of a major program in Yale College and fulfill the distributional requirements for the bachelor's degree, which include the foreign language requirement. Upon their arrival at Yale, transfer students should consult carefully with the director of the transfer program in order to ascertain their status

with regard to the distributional requirements, especially the foreign language requirement.

2. **Terms of enrollment at Yale** Transfer students are expected to enroll in Yale College for the number of terms designated at the time of the final credit evaluation made of their work at previous institutions. Under no circumstances may a transfer student complete fewer than four terms of enrollment in Yale College. Under no circumstances may a transfer student earn fewer than eighteen course credits at Yale or accelerate by the use of acceleration credits.
3. **Transfer of credits** A preliminary evaluation of transferable credits is made at the time of the student's admission. Final evaluation of transfer credits is completed when all official transcripts from a student's previous institutions have been received.
4. **Additional terms at Yale** Students who must remain at Yale beyond the terms designated in the final evaluation of transfer credits must petition the Yale College Committee on Honors and Academic Standing for permission to do so. Such a petition will be considered only if it is impossible for the student to complete the requirements for the bachelor's degree in the designated number of terms. See section A (p. 32) under "Eight Terms of Enrollment." A student thus granted permission to remain at Yale for an additional term, if the term represents more than the equivalent of eight terms of enrollment at the college level, is not eligible for scholarship assistance from Yale for the additional term, although other forms of financial aid may be available.
5. **Transcripts** A transfer student's Yale transcript indicates the institutions from which the student transferred to Yale, and the number of course credits earned there. It does not list the titles of courses taken or grades earned at the transfer student's previous colleges or universities. A transfer student who needs a record of studies completed before admission to Yale must secure a transcript from the previous institutions.
6. **Course credit from outside Yale** Transfer students may receive course credit for work completed outside Yale only for studies completed before matriculation at Yale; transfer students may not receive course credit for any outside courses taken after they have enrolled in Yale College. An exception is made for transfer students who earn credit on a Year or Term Abroad. Transfer students may attend a Year or Term Abroad provided that they enroll in Yale College proper for at least four terms, earning by attendance at Yale a minimum of eighteen course credits.
7. **Distributional requirements** Transfer students are not bound by the distributional requirements for the freshman, sophomore, or junior years, but they must fulfill the distributional requirements for the bachelor's degree. See paragraph 1 above. Transfer students are not eligible for the award of acceleration credit or for acceleration by use of acceleration credits.
8. **Attendance at Yale before enrollment** Once a student has been accepted for admission as a transfer student, the student may not attend Yale as an Eli Whitney student or a nondegree student before his or her first term of enrollment at Yale.

## M. Eli Whitney Students Program

The Eli Whitney Students program is designed to meet the needs of students who may not be able to attend college full time by allowing nonresident students to enroll in Yale College courses for credit. The Eli Whitney Students program is for enrollment for the degree of Bachelor of Arts (B.A.) or Bachelor of Science (B.S.) only; students in the program are therefore ineligible for the simultaneous award of the bachelor's and master's degrees. Like all others enrolled in Yale College, students in this program are required to comply with the academic regulations.

To qualify for the bachelor's degree through the Eli Whitney Students program, a student must successfully complete at least thirty-six course credits or the equivalent, earning at least eighteen of the thirty-six credits at Yale while enrolled in the Eli Whitney Students program. As many as eighteen course credits earned at another college or university or in the Nondegree Students program at Yale may be transferred toward the requirements for the bachelor's degree. Such credit will be awarded for academic courses that were taken at an accredited institution and that were similar in content to Yale College courses. Grades of A or B are expected, and no more than one-quarter of courses accepted for transfer toward the requirements for the degree may have grades of C. Once a student has matriculated at Yale as a candidate for the bachelor's degree, as many as two course credits earned at another institution may be transferred to the student's Yale record, provided that the student earns no fewer than eighteen course credits at Yale. The regulations governing the transfer of such credits are given in section O, Credit from Other Universities (p. 79). The thirty-six course credits completed at Yale or elsewhere must meet the distributional requirements.

Candidates for a bachelor's degree must fulfill the requirements of one of the major programs. See the Majors in Yale College (p. 88) page and also Major Programs (p. 21) in the Undergraduate Curriculum section.

1. **Academic requirements** The Eli Whitney Students program normally is to be completed in a period not exceeding seven years from initial enrollment. In any calendar year, an Eli Whitney student must have completed three courses to remain in academic good standing. Eli Whitney students are required to meet all of the academic obligations of any course in which they enroll and all requirements of their degree program. At the end of each term, the records of all Eli Whitney students will be reviewed; a student who does not have at least a C average for that term will be placed on Academic Warning and may not be permitted to enroll in a subsequent term.
2. **Registration and enrollment** Eli Whitney students submit their course schedules for approval to their residential college dean according to the submission deadline for seniors. Students are permitted to enroll for a full course load, up to 5.5 course credits each term, with the possibility of a greater term load if appropriate permissions are secured. See "Normal Program of Study" in section C (p. 43). Eli Whitney students are not eligible to enroll in freshman seminars, even during their first year in the program.
3. **Tuition and financial aid** Tuition for the 2014–2015 academic year for Eli Whitney students is \$5,100 per course credit; students are eligible to apply for financial aid. Yale employees are entitled to a tuition reduction as determined by the Office of

Human Resources. Tuition must be paid in full to the Office of Student Financial Services before registration.

4. **Facilities and services** Eli Whitney students are entitled to use the library system together with the other facilities that are required for the courses in which they are enrolled, such as laboratories, computers, and the like. They are also eligible for services such as career counseling through Undergraduate Career Services and fellowships through the Center for International and Professional Experience. Eli Whitney students are entitled to purchase gymnasium membership and Yale Health coverage. Students in the Eli Whitney program are not eligible for undergraduate housing and they may not serve as freshman counselors.
5. **Regulations** Eli Whitney students are governed by the academic regulations of Yale College, wherever appropriate, and by the rules contained in the *Undergraduate Regulations*. In disciplinary matters, Eli Whitney students are subject to the jurisdiction of the Yale College Executive Committee.
6. **Leave of absence and withdrawal** See section J, Leave of Absence, Withdrawal, and Readmission (p. 58). All regular deadlines and policies apply.
7. **Year or Term Abroad** With the approval of the director of the Eli Whitney Students program, the department of their major, and the Committee on the Year or Term Abroad, students enrolled in the Eli Whitney Students program may undertake study outside the United States for a full academic year or for either a fall or a spring term. An Eli Whitney student must comply with all deadlines and requirements of the Committee on the Year or Term Abroad. See “Year or Term Abroad” in section K (p. 63). To be eligible to apply, an Eli Whitney student must have accumulated, before enrolling abroad, at least sixteen course credits but no more than twenty-two course credits toward the 36-course-credit requirement and have a B average in course work at Yale. Study abroad must involve full-time work at the university level. Eli Whitney students must enroll for at least two terms in Yale College after their return from study abroad and may not receive degree credit for any other work done at another university after their matriculation at Yale.
8. **Yale students** No person who was ever a regular student in Yale College may enter the Eli Whitney Students program before the lapse of five years after withdrawing from Yale College. A person who in the past has withdrawn from Yale College without graduating and who wishes to return to Yale as a candidate for the bachelor’s degree as an Eli Whitney student must make application to the Eli Whitney Students program and fulfill all of its requirements for the bachelor’s degree, including the requirement that at least eighteen course credits must be earned while the student is enrolled in the Eli Whitney Students program. Once a former Yale College student has entered the Eli Whitney Students program, that student can pursue the bachelor’s degree only through the Eli Whitney Students program.

Further information and application forms for the Eli Whitney Students program are available on the Eli Whitney Students Program Web site (<http://admissions.yale.edu/eli-whitney>).

## N. Nondegree Students Program

The Nondegree Students program is designed to meet the needs of students with specific and defined educational goals, which may include personal or professional enrichment, exploration of new fields, or preparation for career changes. This program offers nonresident students who are unable to attend college full time the opportunity to enroll in Yale College courses for credit. The Nondegree Students program is open to graduates of Yale College, and is also open to academically qualified persons who have attended other colleges and universities, or who have not continued their education beyond high school. Like all others enrolled in Yale College, students in this program are required to comply with the academic regulations. Students not matriculated at Yale but participating in one of Yale's Reserve Officers Training Corps (ROTC) programs under a cross-town arrangement are registered as Nondegree students. As such they are subject to Yale College undergraduate regulations as a condition of their participation in Yale's ROTC program.

Nondegree students may enroll in from one to five courses in any academic term. Nondegree students may not take more than a total of eighteen course credits in the Nondegree Students program.

1. **Academic requirements** Nondegree students are required to meet all of the academic obligations of any course in which they enroll. At the end of a term, the record of any nondegree student who does not have at least a C average for that term will be reviewed, and that student may not be permitted to enroll in a subsequent term. To remain in academic good standing, a student is furthermore expected to complete at least one course per term. Withdrawal from all courses in any given term may jeopardize good standing and enrollment in a subsequent term. Students who plan not to enroll in courses in any given term must apply for a leave of absence on or before the tenth day of the term in question. A leave of absence can be granted for no more than two terms. Any student who does not enroll in courses in a term and does not apply for a leave of absence may be removed from the program.
2. **Registration and enrollment** All nondegree students register for courses with Dean William Whobrey, 55 Whitney Avenue, Suite 420, 432-2430. In general, admission to limited-enrollment courses is not available to nondegree students. Auditing is not permitted in the Nondegree Students program. Nondegree students are not eligible for enrollment in individual tutorial courses; nor are they eligible, while in the Nondegree Students program, for enrollment in courses in the graduate or the professional schools. Those interested in enrolling in such courses should apply directly to the Graduate School or to the particular professional school in whose courses they wish to enroll.
3. **Credit/D/Fail option** Nondegree students who wish to elect a course under the Credit/D/Fail option must make a compelling case for that election in a petition to Dean William Whobrey no later than September 12 for the fall term and January 23 for the spring term. Nondegree students may take no more than one course in a term using the Credit/D/Fail option, and must be enrolled in at least one other course worth a minimum of one course credit during the same term. A maximum of

two courses may be taken Credit/D/Fail during a student's time in the Nondegree Students program.

4. **Tuition** The tuition for nondegree students during 2014–2015 is \$5,100 per course credit; Yale employees and their spouses are entitled to a tuition reduction as determined by the Office of Human Resources. Tuition must be paid in full to the Office of Student Financial Services before registration. Yale provides no financial assistance for nondegree students. Students withdrawing from a course may be eligible for a refund of all or a portion of the tuition fees, in accordance with the tuition refund policy: (a) a student who drops a course for any reason on or before the last day of the course selection period will be refunded the tuition fees paid for that course; (b) a student who drops a course for any reason after the course selection period but on or before the day of midterm will be refunded one-half the tuition paid for that course; (c) a student who drops a course after midterm will not be refunded any portion of the tuition.

Fees for late submission of course schedules apply as outlined in section E, Registration and Enrollment in Courses (p. 46). Note that payments completed after the registration deadline may be subject to late payment fees. Late payments will be accepted (with the addition of a late payment fee) no later than September 19, 2014, for fall 2014, and February 6, 2015, for spring 2015. Any student who has not completed payment in full for courses by these dates will not be permitted to enroll for that term.

5. **Facilities and services** Nondegree students are entitled to use the library system and other facilities that are required for the courses in which they are enrolled, such as laboratories, computers, and the like. For a fee, they are entitled to purchase gymnasium membership and Yale Health coverage. Nondegree students are not eligible for undergraduate housing and they may not serve as freshman counselors.
6. **Regulations** Nondegree students are governed by the academic regulations of Yale College and by the rules contained in the *Undergraduate Regulations* (<http://yalecollege.yale.edu/content/undergraduate-regulations>). In disciplinary matters, nondegree students are subject to the jurisdiction of the Yale College Executive Committee.
7. **Yale students** Students who have withdrawn from Yale College or who did not complete degree requirements within the number of terms of enrollment for which they were admitted may not return to Yale College to complete degree requirements as nondegree students. This rule includes former Yale College students who are currently employees of the University. Students on leave of absence may not be admitted to the Nondegree Students program.
8. **Yale graduates** Graduates of Yale College who have received the bachelor's degree after eight terms of regular enrollment are eligible to apply as nondegree students either on a full-time or on a part-time basis. But Yale College graduates who have taken degrees after fewer than eight terms of regular enrollment are eligible to apply as nondegree students only on a full-time basis until they have completed the equivalent of eight terms of enrollment in Yale College. Thus a student who took a seven-term degree must be a full-time student for the first term in which he or she is a nondegree student, but may be a part-time nondegree student in a subsequent term. For example, a student who has completed degree requirements at the end of a fall term after eight terms of regular enrollment is eligible to apply as a nondegree



student either on a full-time basis or on a part-time basis during the subsequent spring term, but a student who has completed degree requirements at the end of a fall term after seven terms of regular enrollment is eligible to apply as a nondegree student during the subsequent spring term only on a full-time basis. Please note that any courses taken by a former Yale College student in the Nondegree Students program will appear on the undergraduate transcript.

9. **Transfer students** Students who have been accepted for admission as transfer students may not attend Yale as nondegree students before their first term of enrollment at Yale.
10. **Application deadlines** Applications are due on October 1, 2014, for spring term 2015, and on June 1, 2015, for fall term 2015. Yale employees require permission of their supervisors to apply. Nondegree enrollment may begin in either the fall or the spring term.

Further information and application forms are available at the Nondegree Students Program Web site (<http://admissions.yale.edu/non-degree-students-program>).

## O. Credit from Other Universities

A student may not employ course credits earned at another college or university to reduce the expected number of terms of enrollment in Yale College. Under the conditions described below, a student may apply as many as two course credits earned at another college or university toward the 36-course-credit requirement for graduation from Yale College. Before undertaking such outside study, the student should consult the residential college dean about both the institution to be attended and the course to be taken there.

Courses in Yale Summer Session are not considered outside courses, and there is no limit on the number of such courses that a student may offer toward the requirements of the bachelor's degree; see "Courses in Yale Summer Session" in section K (p. 63). Similarly, courses taken in the Yale College program at the Paul Mellon Centre in London are Yale courses and do not count as outside credit. Students who wish to receive credit for summer study abroad with outside programs must apply for approval through the Summer Abroad program (see point 9 below).

1. **Approval of credit** In order for credit to be given for courses taken elsewhere, all of the following conditions must be met:
  - a. The director of undergraduate studies in the subject of a course taken elsewhere must approve the award of credit at Yale for the course.
  - b. A student who has studied at an American university, or abroad on a program sponsored by an American university, must provide the office of the residential college dean with an official transcript of the work completed. A student who has enrolled in a program that is not sponsored by an American university should supply an official transcript if the sponsoring institution issues transcripts; if it does not, then the student must furnish an official certificate of enrollment, showing if possible the course or courses completed.
  - c. Students seeking outside credit should be prepared to furnish a copy of the course syllabus, as well as essays and examinations written in the course. In some cases, a letter from the instructor of the course may be required, or the

student may be asked to pass an examination on the material of the course. Such information may be particularly necessary in the case of study at a foreign university.

- d. Study undertaken in the United States must be at a four-year accredited institution that grants a bachelor's degree in the arts and sciences. Foreign study must be completed at a university or other approved institution. Credit may be awarded only for work done while a student was officially enrolled at such an institution, and cannot be given for any work completed independently of such formal enrollment.
  - e. A grade of A or B is expected; a grade of C is acceptable. Credit cannot be given for a mark of Credit on a Credit/D/Fail option, nor for a grade of Pass on a Pass/Fail option, if the student had the choice of taking the course for a letter grade.
  - f. In order for credit to be given for a course completed at another college or university, the course must carry a value of at least three semester credit hours; if the course is taken at an institution on the quarter system, it must carry a value of at least four-and-one-half quarter units.
  - g. In order for credit to be given for a course completed at another college or university, the number of contact hours for the course must equal or exceed the number of contact hours for an equivalent course offered in Yale College during the fall or spring term, and the length of term (from the first to the last day of classes) must be at least four consecutive weeks.
2. **Residential college seminars** Residential college seminars are, by definition, courses that extend beyond the Yale College curriculum. They are not used as comparables for credit for outside courses, whether in Year or Term Abroad or for other considerations for outside credit.
  3. **Work done while in secondary school** Course credit or distributional credit cannot be given for any college or university course taken while the student was still enrolled in secondary school. Work done after graduation from secondary school but before matriculation at Yale may be accepted on recommendation from the appropriate director of undergraduate studies.

As a regular exception to this rule, students who earned credits while still enrolled in secondary school as members of the Nondegree Students program in Yale College or as students in Yale Summer Session may apply such credits toward the requirements of the bachelor's degree.

4. **Limit of two course credits** Credit cannot be given for more than two course credits earned at another institution. An exception of one additional course credit may be made only by action of the Committee on Honors and Academic Standing upon the student's petition, normally after the final term of enrollment.
5. **Distributional requirements** With permission, course credit earned at another college or university may be applied toward the distributional requirements for the bachelor's degree and to those for the sophomore and junior years whether or not it is counted toward the 36-course-credit requirement for graduation; students should consult with the residential college dean to be directed to the appropriate authority for such approval. Credit from outside Yale may not be applied toward the distributional requirements for the freshman year. Note particularly that Yale does

not award course credit or distributional credit for courses completed at another college or university before the student graduated from secondary school.

6. **The foreign language requirement and courses taken elsewhere** Students who have taken a course in a foreign language at another institution, either in the United States or through a program abroad, and who wish to offer that course toward fulfillment of the foreign language distributional requirement must secure the approval of the relevant director of undergraduate studies. While the approval process varies across departments, in no case can it be completed until an official transcript of the work has been received and reviewed by the department. Typically, an additional assessment of the student's work will be necessary, especially with respect to the level (e.g., L3 through L5) that has been achieved by the outside study. Such assessment might include a written or oral examination or both, a review of the course syllabus and written assignments, or other methods of evaluation. Some departments maintain a list of programs that have been previously evaluated, in which case the approval process is often simplified. Students are therefore strongly encouraged to consult the relevant department before undertaking language study elsewhere.
7. **Major requirements** At the discretion of the director of undergraduate studies in a student's major, work done at another institution may be counted as fulfilling a requirement of the student's major program. This may be done whether or not a course is credited toward the 36-course-credit requirement.
8. **Year or Term Abroad** Students receiving credit for foreign study on a Year Abroad are not eligible to apply additional credit from outside Yale toward the 36-course-credit requirement. Students receiving such credit on a Term Abroad may apply up to two course credits from outside Yale toward the 36-course-credit requirement.  

Students receiving credit for foreign study on a Year or Term Abroad may apply such credit toward the distributional requirements for the bachelor's degree or toward a requirement of the student's major program (see points 5 and 7 above).
9. **Summer Abroad** Students who wish to receive credit for summer study abroad with outside programs must apply for approval through the Summer Abroad program. The deadline to apply for 2015 Summer Abroad credit is March 1, 2015. Information about the application process, including a list of eligible programs, is available at the Study Abroad office in the Center for International and Professional Experience, 55 Whitney Avenue, 3rd floor, and on the Study Abroad Web site (<http://www.yale.edu/yalecollege/international/opportunities/type/study>). Students receiving credit for foreign study on a Summer Abroad may apply such credit toward the distributional requirements for the bachelor's degree or toward a requirement of the student's major program (see points 5 and 7 above).
10. **Transfer students** Students admitted by transfer from another college or university may receive course credit from outside Yale only for work done before matriculation at Yale; transfer students may not receive course credit for any outside courses taken after they have enrolled in Yale College. An exception may under certain circumstances be made in the case of course credits earned by transfer students on a Year or Term Abroad. See section L, Transfer Students (p. 73). Transfer students must enroll in Yale College proper for at least four terms, and earn therein at least eighteen course credits.

11. **Online courses, internships, and the like** Course credit cannot be given for a course taken online even if it is sponsored by another university, including accredited four-year institutions granting a bachelor's degree. Course credit also cannot be given for such programs as internships, field studies, or workshops, unless such programs include as a component a full, regular, academic course of instruction, and are certified by a transcript from an accredited four-year institution granting a bachelor's degree.
12. **Yale transcript** Outside courses may be entered on a student's Yale transcript only if they are applied to the 36-course-credit requirement, the distributional requirements, or the requirements of a major program. Such courses must be entered on the Yale transcript if they are to be applied toward any of these requirements. Except for transcripts of transfer students—on which see section L, Transfer Students (p. 73)—courses that are applied toward the 36-course-credit requirement are listed by title with indication of the credit units earned, but without grades. Courses that are applied toward the distributional requirements only are listed without grades and with the designation “for distributional credit only.” Courses that are applied toward the requirements of a major program only are listed without grades and with the designation “for credit toward the major only.” Once a course has been entered on a student's Yale transcript at the student's request, or as a consequence of readmission, the entry may not subsequently be removed at the student's request.
13. **Acceleration** See section P, Acceleration Policies (p. 82).

## P. Acceleration Policies

### ACCELERATION BY THE EARLY ACCUMULATION OF THIRTY-SIX COURSE CREDITS ALL EARNED AT YALE

A student may accelerate progress toward graduation by accumulating thirty-six course credits in fewer than eight terms of enrollment. Such a student must earn all thirty-six course credits at Yale and may not offer course credits earned at another institution in order to reduce the number of terms of enrollment at Yale.

1. **Study abroad** Terms spent on a Year or Term Abroad count as if they were terms of enrollment in Yale College, but course credits earned therein may not be applied to acceleration by the early accumulation of thirty-six course credits because all such credits must be earned at Yale. A spring term at the Yale College program at the Paul Mellon Centre in London is, in fact, a term of enrollment in Yale College, and credits earned in that program may be applied to such acceleration. Attendance at Yale Summer Session or the summer program at the Paul Mellon Centre in London does not count as a term of enrollment, but course credits earned in these summer programs may be applied toward acceleration by the early accumulation of thirty-six credits all earned at Yale. See “Courses in Yale Summer Session” and “Yale-in-London Summer Program” in section K (p. 63).
2. **Patterns of attendance** While students employing acceleration credits in order to acquire an accelerated degree are required to attend Yale in certain patterns of attendance (see point 4 under “Acceleration by Use of Acceleration Credits”), no particular pattern of attendance is required from a student accelerating by the early accumulation of thirty-six course credits all earned at Yale.

3. **Six or seven terms of enrollment** Either a six-term degree or a seven-term degree may be acquired by the accumulation of thirty-six course credits earned at Yale; graduation after fewer than six terms of enrollment in Yale College by such an early accumulation of course credits is not permitted.
4. **Notification by the student** A student intending to accelerate through the early accumulation of thirty-six course credits all earned at Yale must notify the Committee on Honors and Academic Standing through the residential college dean of that intention by the day on which the student's course schedule is due in the final term of enrollment. Such notification must include written certification from the student's director of undergraduate studies that the student will have completed all of the requirements of the major program, and from the residential college dean that the student will have fulfilled the distributional requirements at the conclusion of that term. Failure to do so will result in the student's being charged a fine of \$100.
5. **Deceleration** A student may subsequently decelerate and take an eight-term degree. A reversion to an eight-term degree will not affect a student's academic good standing or eligibility for eight terms of financial aid.

### ACCELERATION BY USE OF ACCELERATION CREDITS

For the definition of acceleration credits and the criteria for their award, see the Freshman Web site (<http://yalecollege.yale.edu/content/acceleration>). For the sake of equity and fairness, no exceptions can be made to the regulations governing the use of acceleration credits. Inquiries about acceleration may be addressed to the residential college dean or to Chair of the Committee on Advanced Placement and Acceleration, University Registrar's Office, 246 Church Street, 432-2331.

1. **Eligibility** The following charts list the number of total credits needed to accelerate by one or two terms during a given term of enrollment:

Acceleration by One Term	Minimum Total Credits	Minimum Yale Course Credits	Activated Acceleration Credits
In the third term	12	8	4
In the fourth term	16	12	4
In the fifth term	21	17	4
In the sixth term	26	22	4

Acceleration by Two Terms	Minimum Total Credits	Minimum Yale Course Credits	Activated Acceleration Credits
In the third term	17	8	9
In the fourth term	21	12	9
In the fifth term	26	17	9

2. **Application deadline** Application to accelerate is made by submission of the required form to the office of the residential college dean. The deadline for applying for acceleration is the last day of classes in the respective term of enrollment given in the eligibility charts above. As a special exception, a student accelerating by one or two terms who wishes to complete a term of study abroad as early as during the third term of enrollment would have to petition to accelerate before the third term of enrollment. Such a student should consult with the residential college dean.

The absolute and final deadline for applying for acceleration by one term is the last day of classes in the sixth term of enrollment. The absolute and final deadline for applying for acceleration by two terms is the last day of classes in the fifth term of enrollment.

3. **Course credit requirement for graduation** A student accelerating by two terms must earn at least twenty-seven course credits at Yale, and a student accelerating by one term must earn at least thirty-two course credits at Yale. Therefore, with the exception of credit earned through enrollment in the Year or Term Abroad program, a student accelerating by use of acceleration credits may not apply any credit earned at another college or university toward the 36-course-credit requirement for the bachelor's degree.
4. **Enrollment requirements, including required patterns of attendance** A student intending to accelerate by two terms must complete six terms of full-time enrollment in Yale College. Those six terms may be in any pattern of enrollment as long as the student's sixth and final term of enrollment is a spring term.

A student intending to accelerate by one term must complete seven terms of full-time enrollment in Yale College. Those seven terms may be in any pattern of enrollment as long as the student's seventh and final term of enrollment is a spring term.

A student accelerating by two terms may not combine acceleration credits and course credits to graduate in fewer than six terms; six terms of enrollment is the minimum as well as the maximum requirement for acceleration by two terms. Likewise, a student accelerating by one term may not combine acceleration credits and course credits to graduate in fewer than seven terms; seven terms of enrollment is the minimum as well as the maximum requirement for acceleration by one term.

5. **Deceleration** A student accelerating by two terms or one term may subsequently apply to decelerate by submitting the required form to the office of the residential college dean. A student who is considering whether to decelerate should consult with the residential college dean as soon as possible. A student accelerating by two terms who subsequently decides to accelerate by only one term must meet the requirements for acceleration by one term. A student accelerating by two terms or one term may subsequently decide to decelerate completely and take an eight-term degree. Since by definition an eight-term degree is not an accelerated degree, such a student will lose the use of acceleration credits. A reversion to an eight-term degree will not adversely affect a student's academic good standing or eligibility for eight terms of financial aid.
6. **Reacceleration** A student who has declared an intention to decelerate and to relinquish the use of acceleration credits is permitted to accelerate again through the use of acceleration credits as long as the student meets the eligibility requirements and application deadline for one or two terms of acceleration given in points 1 and 2 above.

## GENERAL RULES RELATING TO THE USE OF ACCELERATION CREDITS

1. **Notification** The chief responsibility for ascertaining eligibility and for meeting the deadline to apply for acceleration rests with the students themselves. However, the University Registrar's Office will make reasonable efforts to inform students, at the

beginning of the third term of enrollment, of their eligibility to accelerate by one or two terms.

It is not the responsibility of the University Registrar's Office or Yale College to remind students who have declared an intention to accelerate of the rules on the pattern of attendance stipulated for the use of acceleration credits. Students who are accelerating are themselves responsible for planning to meet these rules, and if a student's pattern of attendance does not conform to them, it will be concluded that the student has decided to relinquish the use of acceleration credits and not to accelerate. Such a student will be automatically decelerated.

2. **Interruption of studies by leave or withdrawal** Terms of enrollment need not be consecutive. A student accelerating by one or two terms has the same privileges of leave of absence or withdrawal that a nonaccelerating student has.
3. **A third term of leave of absence** A student taking an accelerated degree by use of acceleration credits who has had two terms of leave of absence may receive a third term of leave if it is needed to bring the student's pattern of attendance into conformity with the pattern of attendance stipulated for an accelerated degree. See "Leave of Absence" in section J (p. 58); a student who has received long-term loans through Yale or who is receiving financial aid from Yale should particularly note paragraph 8 under "Leave of Absence."
4. **Withdrawal** If a student withdraws from a term after the date on which course schedules for that term are due, the uncompleted term counts as a term of enrollment, both in the determination of the student's eligibility to accelerate and in the calculation of the number of terms in which the student has been in attendance at Yale. As an exception to this rule, if an accelerating student withdraws from Yale College on the recommendation of Yale Health without having successfully completed a term, the student has the option of not counting the uncompleted term as one of the six or seven terms of enrollment.
5. **Enrollment in Yale Summer Session or the Yale-in-London summer program**  
Attendance at Yale Summer Session or the summer program at the Paul Mellon Centre in London does not constitute a term of enrollment. Thus a student accelerating by one term may not offer attendance at Yale Summer Session or the summer program at the Paul Mellon Centre in London as one of the required seven terms of enrollment in Yale College. Course credits earned by attendance at these summer programs, however, may be applied toward the requirements for the bachelor's degree by accelerating students, provided that such students meet the conditions specified for acceleration by one or two terms. See also "Courses in Yale Summer Session" and "Yale-in-London Summer Program" in section K (p. 63).
6. **Course credit from outside Yale** A student accelerating by two terms must earn at least twenty-seven course credits at Yale, and a student accelerating by one term must earn at least thirty-two course credits at Yale. Therefore, an accelerating student may not apply any credit earned at another college or university toward the 36-course-credit requirement for the bachelor's degree. A student, whether accelerating or not, may be permitted to apply course credits earned at another college or university toward the requirements of the student's major program or toward any of the distributional requirements other than those for the freshman year. See section O, Credit from Other Universities (p. 79).

Please note that attendance at the Yale College program at the Paul Mellon Centre in London during the spring term counts just as if it were a term of enrollment at Yale College in New Haven. Attendance at the Paul Mellon Centre during the summer, however, does not count as a term of enrollment. See “Yale-in-London Summer Program” in section K (p. 63).

7. **Year or Term Abroad** A Year Abroad counts as two terms and a Term Abroad counts as one term of enrollment in Yale College. Credits earned on a Year or Term Abroad count as the equivalent of Yale course credits.

Note that after a Year or Term Abroad all students must attend two subsequent terms in Yale College; see “Year or Term Abroad” in section K (p. 63). In many cases a student must relinquish the use of acceleration credits and decelerate in order to take a Year or Term Abroad. As a special exception, a student accelerating by one or two terms who wishes to complete a term of study abroad as early as during the third term of enrollment would have to petition to accelerate before the third term of enrollment. A student who wishes to accelerate and to take a Year or Term Abroad should consult with the residential college dean and the Center for International and Professional Experience at the earliest opportunity.

An accelerating student who wishes also to complete a Year or Term Abroad must conform to one of the following schemes:

Terms of Acceleration	Total Terms at Yale	Total Terms on YA/TA	Acceleration Credits	Minimum Course Credits Earned at Yale	Maximum Course Credits Earned on YA/TA
1	6	1	4	28	4
1	5	2	4	23	9
2	5	1	9	23	4
2	4	2	9	18	9

8. **Distributional requirements** Acceleration credits may not be employed to meet the distributional requirements for the freshman, sophomore, or junior years, or the distributional requirements for the bachelor’s degree, including the foreign language requirement. With permission, an accelerating student may apply course credit earned at another college or university toward the distributional requirements for the bachelor’s degree and to those for the sophomore and junior years; students should consult with the residential college dean to be directed to the appropriate authority for such approval.
9. **Major requirements** With the permission of the director of undergraduate studies, an accelerating student may apply credit earned at another university toward the requirements of the student’s major program.
10. **Makeup of course credit deficiency** If an accelerating student’s record at the end of a term of enrollment shows a deficiency for promotion, academic good standing, or graduation, the student will be allowed to repair the deficiency without forfeiting the use of acceleration credits only through enrollment in Yale Summer Session if the credit earned is to be applied toward the 36-course-credit requirement for the bachelor’s degree. See section D, Promotion and Good Standing (p. 45).
11. **Enrollment after graduation as a nondegree student** Accelerating students who have qualified for the award of the bachelor’s degree are eligible, as are all Yale



College graduates, for full-time enrollment in Yale College as nondegree students. Because such students will have graduated, they will not be eligible for financial aid. See section N, Nondegree Students Program (p. 77).

12. **Transfer students** Students admitted by transfer from other colleges and universities are not eligible for acceleration by the use of acceleration credits.

## Q. Amendments

The University reserves the right to amend or supplement these regulations at any time upon such notice to students as it deems appropriate.

# III. SUBJECTS OF INSTRUCTION

## Majors in Yale College

African American Studies (B.A.)  
African Studies (B.A.)  
American Studies (B.A.)  
Anthropology (B.A.)  
Applied Mathematics (B.A. or B.S.)  
Applied Physics (B.S.)  
Archaeological Studies (B.A.)  
Architecture (B.A.)  
Art (B.A.)  
Astronomy (B.A.)  
Astronomy and Physics (B.S.)  
Astrophysics (B.S.)  
Chemistry (B.A. or B.S.)  
Chinese (B.A.)  
Classical Civilization (B.A.)  
Classics (B.A.)  
Cognitive Science (B.A.)  
Computer Science (B.A. or B.S.)  
Computer Science and Mathematics (B.A. or B.S.)  
Computer Science and Psychology (B.A.)  
Computing and the Arts (B.A.)  
East Asian Languages and Literatures (B.A.)  
East Asian Studies (B.A.)  
Ecology and Evolutionary Biology (B.A. or B.S.)  
Economics (B.A.)  
Economics and Mathematics (B.A.)  
Electrical Engineering and Computer Science (B.S.)  
Engineering  
Biomedical Engineering (B.S.)  
Chemical Engineering (B.S.)  
Electrical Engineering (B.S.)  
Engineering Sciences (Environmental) (B.A.)  
Engineering Sciences (Chemical) (B.S.)  
Engineering Sciences (Electrical or Mechanical) (B.A. or B.S.)  
Environmental Engineering (B.S.)  
Mechanical Engineering (B.S.)  
English (B.A.)  
Environmental Studies (B.A.)  
Ethics, Politics, and Economics (B.A.)  
Ethnicity, Race, and Migration (B.A.)  
Film Studies (B.A.)  
French (B.A.)  
Geology and Geophysics (B.S.)  
Geology and Natural Resources (B.A.)  
German (B.A.)  
German Studies (B.A.)  
Global Affairs (B.A.)  
Greek, Ancient and Modern (B.A.)  
History (B.A.)  
History of Art (B.A.)  
History of Science, Medicine, and Public Health (B.A.)  
Humanities (B.A.)  
Italian (B.A.)  
Japanese (B.A.)  
Judaic Studies (B.A.)  
Latin American Studies (B.A.)  
Linguistics (B.A.)  
Literature (B.A.)  
Mathematics (B.A. or B.S.)  
Mathematics and Philosophy (B.A.)  
Mathematics and Physics (B.S.)  
Modern Middle East Studies (B.A.)  
Molecular Biophysics and Biochemistry (B.A. or B.S.)  
Molecular, Cellular, and Developmental Biology (B.A. or B.S.)  
Music (B.A.)  
Near Eastern Languages and Civilizations (B.A.)  
Philosophy (B.A.)  
Physics (B.S.)  
Physics and Geosciences (B.S.)  
Physics and Philosophy (B.A.)  
Political Science (B.A.)  
Portuguese (B.A.)  
Psychology (B.A. or B.S.)  
Religious Studies (B.A.)  
Russian (B.A.)  
Russian and East European Studies (B.A.)  
Sociology (B.A.)  
South Asian Studies (second major only)  
Spanish (B.A.)  
Special Divisional Major (B.A. or B.S.)  
Statistics (B.A. or B.S.)  
Theater Studies (B.A.)  
Women's, Gender, and Sexuality Studies (B.A.)

# Accounting

## Courses

\* **ACCT 270a or b, Foundations of Accounting and Valuation** Rick Antle

Modern accounting practices and their use in distinguishing value creation from value redistribution. Basic determinants of value and the techniques used to assess it; the creation of value through the production and delivery of goods or services; the conversion of that value into cash flows; basic financial statements, balance sheets, income statements, and cash flow statements, and the accounting mechanics with which they are built. Undergraduate enrollment limited to 40.

## Aerospace Studies

Program chair: Colonel Phil Haun, USAF; program adviser: Major Timothy Secor, USAF, [timothy.secor@yale.edu](mailto:timothy.secor@yale.edu); Rm. 450, 55 Whitney Ave., 432-9431; [afrotc.yalecollege.yale.edu](http://afrotc.yalecollege.yale.edu)

The mission of Air Force Reserve Officers Training Corps (AFROTC) Detachment 009 at Yale is to develop quality leaders for the U.S. Air Force. Cadets have gone on to serve in a range of career fields, from medicine to aviation. The program offers students an ideal training environment that instills values such as integrity, service before self, and excellence. Cadets are also involved in a variety of activities and organizations that reach out to the local community while strengthening the skills necessary for a military career. After completing all Air Force ROTC and academic degree requirements, cadets on scholarship and those in the Professional Officer Course accept a commission as a second lieutenant in the Air Force, with a minimum active-duty service commitment of four years.

**Academic requirements** The Aerospace Studies curriculum is organized into four major areas, including profession of arms, communication skills, leadership studies, and military and international security studies. Courses emphasize development of professional knowledge and leadership skills in the context of military service. Classes are conducted as seminars and call for active student discussion. All uniforms, textbooks, and supplies for cadets are provided by the Air Force. Enrollment in Aerospace Studies courses is not limited to cadets; courses are open to any Yale student. Aerospace Studies courses count for enrollment credit only; they do not count toward the thirty-six course credits required for the Yale bachelor's degree. In some cases, courses in other departments and programs may count toward both the bachelor's degree and AFROTC requirements. For example, HIST 221, Military History of the West since 1500, fulfills the first term of the 200-level AFROTC requirement and also counts toward the bachelor's degree. No course taken Credit/D/Fail may be counted toward the program in Aerospace Studies.

Cadets become involved in the management of their own cadet wing through a mandatory two-hour leadership laboratory each week. They are assigned corps positions, with increasing responsibility over their four years. In addition, students in the program participate in physical training, leadership projects, visits to Air Force

bases, orientation flights, and normal college extracurricular activities. In all, cadets can expect to dedicate six to eight hours per week to the program.

Freshmen and first-term sophomores are eligible for enrollment in the AFROTC program. Full and partial scholarships that may cover tuition, fees, books, and/or a subsistence allowance are available, with levels dependent on qualifications and other factors. Scholarships are open to both freshmen and sophomores who excel in academics and display leadership potential.

For additional information about Yale's Air Force Reserve Officers Training Corps program, visit the program's Web site (<http://afrotc.yalecollege.yale.edu>) or send questions to Major Timothy Secor at [timothy.secor@yale.edu](mailto:timothy.secor@yale.edu).

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\* **USAF 101a and USAF 102b, Foundation of the U.S. Air Force** Timothy Secor  
Introduction to the U.S. Air Force and how it works as a military institution, including an overview of its basic characteristics, missions, and organizations. Students attend one 50-minute lecture and one 110-minute laboratory each week. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors. o Course cr per term

\* **USAF 202b, The Evolution of U.S. Air and Space Power** Staff  
The development and employment of American air and space power from the Korean Conflict to the present. The distinctive capabilities and functions of air and space power; Air Force heritage and leaders; continued application of communication skills. Prerequisites: USAF 101, 102, and HIST 221. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors. o Course cr

\* **USAF 301a and USAF 302b, Air Force Leadership Studies** Timothy Secor  
Advanced study of leadership concepts and ethics, management and communication skills, and Air Force personnel and evaluation systems. Emphasis on the enhancement of leadership skills. Case studies and exercise of leadership and management techniques in a supervised environment. Prerequisite: USAF 202. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors. o Course cr per term

\* **USAF 401a and USAF 402b, National Security Affairs and Preparation for Active Duty** Staff  
Overview of the complex social and political issues facing the military profession. Designed to provide seniors with a foundation for understanding their role as military officers in American society. Prerequisites: USAF 301, 302 and field training. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors. o Course cr per term

COURSE IN ANOTHER DEPARTMENT THAT COUNTS TOWARD AFROTC REQUIREMENTS

**HIST 221a / GBL 281a, Military History of the West since 1500** Paul Kennedy

A study of the military history of the West since 1500, with emphasis on the relationship between armies and navies on the one hand, and technology, economics, geography, and the rise of the modern nation-state on the other. The coming of airpower in its varied manifestations. Also meets requirements for the Air Force and Naval ROTC programs. HU

## African American Studies

Director of undergraduate studies: Erica James, Rm. 302, 81 Wall St., 432-9718 or 432-7758, erica.james@yale.edu; afamstudies.yale.edu

### FACULTY OF THE DEPARTMENT OF AFRICAN AMERICAN STUDIES

**Professors** Elizabeth Alexander, Elijah Anderson, David Blight, Hazel Carby, Glenda Gilmore, Jacqueline Goldsby, Emily Greenwood, Jonathan Holloway, Matthew Jacobson, Gerald Jaynes, Kobena Mercer, Christopher L. Miller, Joseph Roach, Robert Stepto, Robert Thompson, Michael Veal

**Associate Professors** Jafari Allen, Crystal Feimster, Edward Rugemer

**Assistant Professors** Erica James, Anthony Reed, Vesla Weaver

**Senior Lecturer** Kathleen Cleaver

The African American Studies major examines, from numerous disciplinary perspectives, the experiences of people of African descent in Black Atlantic societies such as the United States, the Caribbean, and Latin America, including the global impact of those experiences. Students in the department explore the historical, cultural, political, economic, and social development of Black Atlantic societies. Majors work to become informed thinkers who are intellectually prepared to offer clarity and insight to ongoing academic and public debates centered in the discipline.

African American Studies majors become knowledgeable about the history, primary methodologies, and interdisciplinary breath of the field. In the process, students learn to critique, articulate, analyze, and interpret universal themes concerning both individuals in society and group interactions as they relate to the work of scholars, scientists, writers, artists, musicians, economists, and entrepreneurs.

African American Studies offers training of special interest to those considering admission to graduate or professional schools and careers in education, journalism, law, business management, city planning, international relations, politics, psychology, publishing, public health, or social work. The interdisciplinary structure of the department offers students an opportunity to satisfy the increasingly rigorous expectations of admissions committees and prospective employers for a broad liberal arts perspective that complements specialized knowledge of a field.

African American Studies can be taken either as a stand-alone major or as one of two majors in consultation with the director of undergraduate studies. Pertinent regulations can be found under Two Majors (p. 67) in section K of the Academic Regulations.

**Requirements of the major** The major in African American Studies requires twelve term courses, including seven core courses and five electives in an area of concentration. The seven core courses include the African American history sequence AFAM 160 and 162, which can be taken in either order; one course in the humanities relevant to African American studies; one course in the social sciences relevant to African American studies; the junior seminar (AFAM 410); and the senior colloquium (AFAM 480) and senior essay (AFAM 491). AFAM 162 will not be offered in 2014–2015; students who need to fulfill the history requirement in this academic year should enroll in AFAM 125, in consultation with the director of undergraduate studies.

**Area of concentration** Students majoring in African American Studies are required to choose an area of concentration comprising five courses. This cluster of interrelated courses is intended to ground the student's learning experience in one area of investigation. Often students will choose an area of concentration in a traditional discipline such as political science, art history, economics, sociology, American studies, history, or English language and literature. Students can also construct interdisciplinary areas of concentration that span traditional departments and encompass broader theoretical frameworks such as race and ethnicity, cultural studies, or feminism and gender studies. All majors are encouraged to take upper-level courses as part of their concentration, especially those courses centering on research and methodology.

None of the seven core courses may be counted among the required electives in the area of concentration.

**Junior seminar** In their junior year students must take the junior seminar, AFAM 410. This course provides majors with theoretical and methodological bases for the work they will do during their research-oriented senior year.

**Senior requirement** Senior majors participate in a colloquium in AFAM 480 that gives them an opportunity to exchange ideas with each other and with more advanced scholars. Students in AFAM 480 submit a prospectus, compile a working bibliography, begin or continue research, and write the first twenty pages of the senior essay. After completing the colloquium, each student carries out the remaining research and writing of a senior essay in AFAM 491 under the guidance of a faculty member in the chosen discipline or area of concentration.

Students are strongly encouraged to use the summer between the junior and senior years for research directly related to the senior essay. For example, field or documentary research might be undertaken in urban or rural communities throughout the Black Atlantic diaspora. The particular research problem and design are to be worked out in each case with a faculty adviser.

**Credit/D/Fail** For the class of 2017 and subsequent classes, no more than one course taken Credit/D/Fail may be counted toward the major.

**Procedures** Students considering a program of study in African American Studies should consult the director of undergraduate studies as early as possible. Areas of concentration and schedules for majors must be approved by the director of undergraduate studies.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 term courses

**Specific courses required** AFAM 160, 162, 410

**Distribution of courses** 1 relevant humanities course and 1 relevant social science course, both approved by DUS; 5 courses in area of concentration

**Senior requirement** Senior colloquium (AFAM 480) and senior essay (AFAM 491)

## Courses

**\* AFAM 010a / AMST 018a / ENGL 014a, Twentieth-Century African American**

**Poetry** Elizabeth Alexander

African American poetry from Paul Laurence Dunbar to the present, with special attention to the contemporary Black poetry renaissance. Works explored in the contexts of locale, history, and literary and cultural movements. Research conducted in the Beinecke Library's archives and in other archival collections at Yale. Includes attendance at poetry readings on campus, classroom visits by practicing poets in the contemporary canon, and a field trip to New York City. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU RP

**\* AFAM 060a / AMST 060a / HIST 016a, Significance of American Slavery**

Edward Rugemer

The history of American slavery, its destruction during the nineteenth century, and its significance today. Topics include the origins of slavery, the development of racism, the transatlantic slave trade, the experience of enslavement, resistance to slavery, the abolitionist movement, the process of emancipation, and the perpetuation of slavery and other forms of unfree labor in the twenty-first century. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

**AFAM 112a / HSAR 379a, New York Mambo: Microcosm of Black Creativity**

Robert Thompson

The rise, development, and philosophic achievement of the world of New York mambo and salsa. Emphasis on Palmieri, Cortijo, Roena, Harlow, and Colón. Examination of parallel traditions, e.g., New York Haitian art, Dominican merengue, reggae and rastas of Jamaican Brooklyn, and the New York school of Brazilian capoeira. HU

**AFAM 125a / AMST 125a / HIST 136a, The Long Civil Rights Movement**

Crystal Feimster

Political, social, and artistic aspects of the U.S. civil rights movement from the 1920s through the 1980s explored in the context of other organized efforts for social change. Focus on relations between the African American freedom movement and debates about gender, labor, sexuality, and foreign policy. Changing representations of social movements in twentieth-century American culture; the politics of historical analysis.

HU

**AFAM 140b / AMST 211b / ENGL 293b / ER&M 210b / WGSS 211b, Race and Gender in American Literature** Birgit Rasmussen

The role of literature in constructing representations of America as an idea, a nation, a colonial settlement, and a participant in world affairs. What kind of place America is and who belongs there; the consequences of America's history for its national literature. Emphasis on the ways texts represent and contest social concepts of race and gender difference. WR, HU

**AFAM 160a / AMST 160a / HIST 184a, The Rise and Fall of Atlantic Slavery**

Edward Rugemer

The history of peoples of African descent throughout the Americas, from the first African American societies of the sixteenth century through the century-long process of emancipation. HU

**AFAM 172b / HIST 119b, The Civil War and Reconstruction Era, 1845–1877**

David Blight

The causes, course, and consequences of the American Civil War. A search for the multiple meanings of a transformative event, including national, sectional, racial, constitutional, social, gender, intellectual, and individual dimensions. HU

**AFAM 178b / AFST 188b / ER&M 278b / HSAR 378b, From West Africa to the Black****Americas: The Black Atlantic Visual Tradition** Robert Thompson

Art, music, and dance in the history of key classical civilizations south of the Sahara – Mali, Asante, Dahomey, Yorùbá, Ejagham, Kongo – and their impact on New World art and music, especially rock, blues, North American black painting of the past ten years, and black artists of Cuba, Haiti, and Brazil. HU

**AFAM 183a / HSAR 375a, Afro-Modernism in the Twentieth Century**

Kobena Mercer

Introductory survey of African American, Caribbean, and black British artists in the context of modernism and postmodernism. Cross-cultural dynamics in the aesthetics and politics of race and representation. HU

**AFAM 194b / AMST 194b / ENGL 194b, African American Arts Today**

Elizabeth Alexander

The renaissance in African American culture from 1980 to the present. Great works of poetry, fiction, creative nonfiction, drama, film, music, dance, painting, photography, and hip-hop by living African American artists. Critical vocabularies and approaches with which to think about questions of genre; writing knowledgeably and persuasively about art across multiple genres and in historical context. Artists include Anna Deavere Smith, Suzan-Lori Parks, Toni Morrison, Edwidge Danticat, Colson Whitehead, Hilton Als, Rita Dove, Terrance Hayes, Bill T. Jones, Kerry James Marshall, Lorna Simpson, Jason Moran, and Jay-Z. Lectures feature public conversations with several of the artists studied. HU

**AFAM 203a / MUSI 277a, Coltrane and Hendrix** Michael Veal

The parallel careers of John Coltrane and Jimi Hendrix in different genres of black music explored through biographical, music-analytical, and sociocontextual approaches. The stylistic evolutions in each musician's work; the music of Coltrane and Hendrix as embodiments of, and reactions to, the dominant musical and social issues of the 1960s. HU

**AFAM 215b / HSAR 373b, African American Art, 1963 to the Present** Erica James

Modern African American artistic production explored in the context of American art and social history. Critical race theory and artistic discourse from the Spiral group in 1963, to the Black Arts Movement and the culture wars, to current readings in American and postblack art. The complicated relations between African American art and politics. Use of art objects from the Yale University Art Gallery. HU



\* **AFAM 251b / AMST 397b, Critical Race Theory** Crystal Feimster

Introduction to critical race theory, a radical critique of relations among race, law, and power in U.S. politics and society. Intellectual foundations of the field, with emphasis on African American perspectives; key juridical acts. The centrality of U.S. law in producing social hierarchies of race and racial difference, gender, sexuality, and class. The extension of critical race theory to global analysis of race, immigration, and cultural difference.

\* **AFAM 254a, Archives of Black Atlantic Slavery** Heather Vermeulen

Twentieth- and twenty-first-century creative engagements with the archives of Atlantic slavery and its afterlife. How those archives took shape; subsequent efforts to address those archives' silences, violences, and possibilities through literature, art, and music.

HU

\* **AFAM 255a / HIST 139Ja, The American South, 1870 to the Present**

Glenda Gilmore

A thematic approach to the history of the American South since Reconstruction. Focus on the political, social, and cultural history of a region that has undergone dramatic change. Topics include white supremacy and African American resistance, industrialization and labor activism, music and literature, the civil rights movement and the rise of the Republican South, and changing regional identity. WR, HU

\* **AFAM 268a / PLSC 245a, Urban Politics and Policy** Cynthia Horan

Approaches to urban politics and political economy. Application of theories to contemporary policy issues such as policing, metropolitan disparities, and inner-city revitalization. SO

\* **AFAM 269b / EP&E 458b / PHIL 461b / PLSC 315b, Egalitarianism**

Christopher Lebron

The concept of equality in normative political theory explored through contemporary philosophical texts. Reasons why oppressed, marginalized, and systematically disadvantaged groups express their claims in terms of equality; racial inequality as a case study. SO

\* **AFAM 270b / PLSC 280b, Poverty, Politics, and Policy in the American City**

Cynthia Horan

Examination of how politics informs the formulation and implementation of policies to address urban poverty. Consideration of alternative explanations for poverty and alternative government strategies. Focus on efforts by local organizations and communities to improve their situations within the context of government actions. SO

\* **AFAM 273b / SOCY 314b / WGSS 316b, Inequality in America** Vida Maralani

Empirical, theoretical, and methodological issues involved in the study of inequalities in occupation, income, wealth, education, health, and neighborhoods. Intergenerational mobility, marriage and family processes, and inequalities of race, ethnicity, and gender. Questions include whether the United States is a land of opportunity and how different social groups fare and why. WR, SO

\* **AFAM 276b / PLSC 222b, Race and the Politics of Punishment** Vesla Weaver

Historical and contemporary issues surrounding race and punishment in the American criminal justice system, with a focus on research involving institutional development, policy history, and racial orders. The influence of racial perceptions on policy preferences; ways in which the criminal justice system defines and creates race; debates

about black inclusion and equality and their relation to debates about crime and punishment. SO

\* **AFAM 291b / HSAR 470b, Pop Art and Black Culture** Kobena Mercer

Pop art strategies among African American artists who contributed a critique of the modernist canon from the 1950s to present. Critical uses of vernacular materials are studied in view of postmodern theories of art and popular culture. HU

\* **AFAM 302a / ENGL 332a, Music and African American Literature** Anthony Reed

Reading of canonical and recent African American literature to trace connections between music and writing. Uses of music, sound, and sound engineering in black literary culture from jazz and blues poetry to hip-hop. No knowledge of music required. WR, HU

\* **AFAM 324a / AMST 337a / ER&M 314a, Urban Latina/o Cultures** Dixia Ramirez  
Latina/o urbanism as expressed in literature and culture. Focus on the twentieth and twenty-first centuries, with background on the formation of Latina/o communities in the nineteenth century. Sources include film and the visual arts. HU

\* **AFAM 325a / PLSC 211a, Social Policy and the Politics of Inequality in the United States** Vesla Weaver

The contours and consequences of inequality in the United States, including explanations for why it has expanded over the past several decades and why Americans seem to tolerate more of it. The development of the modern welfare state; causes of racialized poverty, segregation, and incarceration. SO

\* **AFAM 336b / AMST 336b / ER&M 315b, Haitian and Dominican Literature and Culture** Dixia Ramirez

The literature and culture of Haiti, the Dominican Republic, and their diasporas in the United States and Canada since 1804. Focus on texts that explore relations between the two nations, with some attention to each country's individual literary and cultural traditions. Conventional literary texts such as novels and poetry, as well as political documents, orally transmitted texts, and imagery. HU

\* **AFAM 338a / ENGL 335a / LITR 280a, Caribbean Poetry** Anthony Reed

Survey of major twentieth-century Caribbean poets such as Derek Walcott, Kamau Brathwaite, and Aimé Césaire. WR, HU

\* **AFAM 349b / AMST 326b / WGSS 388b, Civil Rights and Women's Liberation**  
Crystal Feimster

The dynamic relationship between the civil rights movement and the women's liberation movement from 1940 to the present. When and how the two movements overlapped, intersected, and diverged. The variety of ways in which African Americans and women campaigned for equal rights. Topics include World War II, freedom summer, black power, the Equal Rights Amendment, feminism, abortion, affirmative action, and gay rights. HU

\* **AFAM 380a / AMST 407a / HIST 111Ja, Antebellum America** Edward Rugemer

History of the United States from the Jackson administration through the Civil War. Emphasis on race, slavery, and the coming of the war, with some attention to western expansion. WR, HU

\* **AFAM 383b / AFST 476b / FREN 376b, The Two Congos: Literature and Culture in the Heart of Africa** Christopher Miller

An interdisciplinary approach to two nations that share a name, a river, and elements of culture but that are divided by colonial heritage (one Belgian, one French). Emphasis on literature, with references to history, film, anthropology, art, politics, music, and sports. Views from outside the two countries (*Heart of Darkness*, *Tintin*, V.S. Naipaul) and inside (H. Lopes, V. Y. Mudimbe, A. Mabanckou, S. Mukasonga). The 1974 Ali-Foreman "Rumble in the Jungle" boxing match; Rwandan genocide in film and literature. Reading knowledge of French required. HU

\* **AFAM 408a / AMST 460a / ENGL 443a, African American Poets of the Modern Era** Robert Stepto

The African American practice of poetry between 1900 and 1960, especially of sonnets, ballads, sermonic, and blues poems. Poets include Paul Laurence Dunbar, Langston Hughes, Sterling Brown, Gwendolyn Brooks, Margaret Walker, and Robert Hayden. Class sessions at the Beinecke Library for inspection and discussion of original editions, manuscripts, letters, and other archival material. HU

\* **AFAM 410b / AMST 310b / WGSS 410b, Interdisciplinary Approaches to African American Studies** Jafari Allen

An interdisciplinary, thematic approach to the study of race, nation, and ethnicity in the African diaspora. Topics include class, gender, color, and sexuality; the dynamics of reform, Pan-Africanism, neocolonialism, and contemporary black nationalism. Use of a broad range of methodologies. WR, HU, SO

\* **AFAM 411a / AMST 426a / ER&M 413a / WGSS 411a, Fictions of Imaginary and Imminent Futures** Hazel Carby

Ways in which creative artists can imagine and reimagine definitions of the human, through hybridity, crossing the boundaries of species being, contesting ideas of racialized bodies, expanding the possibilities of genders and sexualities, and questioning the relationship between biology, technology, and the body. Focus on an international range of literature, novels, and short stories in the genre of science and speculative fiction, as well as various forms of futurism in visual and sonic culture. HU

\* **AFAM 428b / AMST 335b / THST 406b, Dance and Black Popular Culture** Staff

Approaches to theorizing performance, in particular dance performance of a black diaspora. Uncovering methodologies pertinent to the discovery and analysis of dance performance, intersections of black popular culture, and concepts of the corporeal. HU

\* **AFAM 471a and AFAM 472b, Independent Study: African American Studies** Erica James

Independent research under the direction of a member of the department on a special topic in African American studies not covered in other courses. Permission of the director of undergraduate studies and of the instructor directing the research is required. A proposal signed by the instructor must be submitted to the director of undergraduate studies by the end of the second week of classes. The instructor meets with the student regularly, typically for an hour a week, and the student writes a final paper or a series of short essays. May be elected for one or two terms.

\* **AFAM 480a, Senior Colloquium: African American Studies** Crystal Feimster

A seminar on issues and approaches in African American studies. The colloquium offers students practical help in refining their senior essay topics and developing research

strategies. Students discuss assigned readings and share their research experiences and findings. During the term, students are expected to make substantial progress on their senior essays; they are required to submit a prospectus, an annotated bibliography, and a draft of one-quarter of the essay.

\* **AFAM 491a or b, The Senior Essay** Erica James

Independent research on the senior essay. The senior essay form must be submitted to the director of undergraduate studies by the end of the second week of classes. The senior essay should be completed according to the following schedule: (1) end of the sixth week of classes: a rough draft of the entire essay; (2) end of the last week of classes (fall term) or three weeks before the end of classes (spring term): two copies of the final version of the essay.

## African Studies

Director of undergraduate studies: Cheryl Doss, 309 LUCE, 432-9395, [cheryl.doss@yale.edu](mailto:cheryl.doss@yale.edu); director of the Program in African Languages: Kiarie Wa’Njogu, 309B LUCE, 432-0110, [john.wanjogu@yale.edu](mailto:john.wanjogu@yale.edu); [www.yale.edu/macmillan/african](http://www.yale.edu/macmillan/african)

### FACULTY ASSOCIATED WITH THE PROGRAM OF AFRICAN STUDIES

**Professors** Lea Brilmayer (*Law School*), John Darnell (*Near Eastern Languages & Civilizations*), Owen Fiss (*Law School*), Robert Harms (*History*), Andrew Hill (*Anthropology*), Roderick McIntosh (*Anthropology*), Christopher L. Miller (*African American Studies, French*), Nicoli Nattrass (*Ethics, Politics, & Economics*) (*Visiting*), Catherine Panter-Brick (*Anthropology*), Lamin Sanneh (*History, Divinity School*), Jeremy Seekings (*Global Affairs*) (*Visiting*), Ian Shapiro (*Political Science*), Robert Thompson (*History of Art*), Christopher Udry (*Economics*), Michael Veal (*Music*), David Watts (*Anthropology*), Elisabeth Wood (*Political Science*)

**Assistant Professors** Rob Bailis (*Forestry and Environmental Studies*), Katharine Baldwin (*Political Science*), Adria Lawrence (*Political Science*), Louisa Lombard (*Anthropology*), Daniel Magaziner (*History*), Jonathan Wrytzen (*Sociology*)

**Senior Lecturer** Cheryl Doss (*Economics*)

**Lecturers** Lacina Coulibaly (*Theater Studies*), Anne-Marie Foltz (*Public Health*), David Simon (*Political Science*)

**Senior Lectors II** Sandra Sanneh, Kiarie Wa’Njogu

**Senior Lectors** Oluseye Adesola, Matuku Ngame

The program in African Studies enables students to undertake interdisciplinary study of the arts, history, cultures, politics, and development of Africa. As a foundation, students in the program gain a cross-disciplinary exposure to Africa. In the junior and senior years, students develop analytical ability and focus their studies on research in a particular discipline such as anthropology, art history, history, languages and literatures, political science, or sociology.

African Studies provides training of special interest to those considering admission to graduate or professional schools, or careers in education, journalism, law, management, medicine, politics, psychology, international relations, creative writing, or social work. The interdisciplinary structure of the program offers students an opportunity to satisfy

the increasingly rigorous expectations of admissions committees and prospective employers for a broad liberal arts perspective that complements specialized knowledge of a field.

**Requirements of the major** The program in African Studies consists of thirteen term courses including (1) one African Studies course in the humanities and one in the social sciences; (2) two years of an African language (Arabic, Kiswahili, Yorùbá, isiZulu, or others with permission of the director of undergraduate studies), unless waived by examination; (3) the junior seminar on research methods, AFST 401; (4) a concentration of four term courses, selected in consultation with the director of undergraduate studies, in a discipline such as anthropology, art history, history, languages and literatures, political science, or sociology, or in an interdisciplinary program such as African American Studies, Ethnicity, Race, and Migration, or Women's, Gender, and Sexuality Studies, or in a cross-disciplinary area such as diaspora studies or development studies; and (5) one additional course that either deepens the concentration or provides methodological tools for the senior essay.

The required courses represent the core of the program and are intended to expose the student both to the interdisciplinary nature of African studies and to the methodologies currently being brought to bear on the study of African cultures and societies. Students are encouraged to include upper-level courses, especially those centering on research and methodology.

**Senior requirement** Students are required to complete a senior essay in AFST 491, working under the guidance of a faculty adviser.

A preliminary statement indicating the topic to be addressed and the name of the faculty adviser must be submitted to the director of undergraduate studies by the end of the second week of the fall term in the senior year. Students should also inform the director of undergraduate studies of their preferred second reader by this time.

**Language requirement** African Studies majors are required to complete two years of college-level study (or the equivalent) of an African language, and they are encouraged to continue beyond this level. For the language requirement to be waived, a student must pass a placement test for admission into an advanced-level course or, for languages not regularly offered at Yale, an equivalent test of speaking, listening, reading, and writing skills administered through the Center for Language Study. Students should begin their language study as early as possible. If the requirement is waived, students must substitute other African Studies courses for the four required language courses.

**Program in African Languages** The language program offers instruction in three major languages from sub-Saharan Africa: Kiswahili (eastern and central Africa), Yorùbá (West Africa), and isiZulu (southern Africa). African language courses emphasize communicative competence, using multimedia materials that focus on the contemporary African context. Course sequences are designed to enable students to achieve advanced competence in all skill areas by the end of the third year, and students are encouraged to spend a summer or term in Africa during their language study.

Courses in Arabic are offered through the department of Near Eastern Languages and Civilizations. Noncredit instruction in other African languages is available by

application through the Directed Independent Language Study program at the Center for Language Study. Contact the director of the Program in African Languages for information.

**Procedure** Students planning to major in African Studies should consult the director of undergraduate studies as early as possible.

**M.A. program** The African Studies program does not offer the simultaneous award of the B.A. and M.A. degrees. However, students in Yale College are eligible to complete the M.A. in African Studies in one year of graduate work if they begin the program in the third and fourth undergraduate years. Students interested in this option must complete eight graduate courses in the area by the time of the completion of the bachelor's degree. Only two courses may be counted toward both graduate and undergraduate degrees. Successful completion of graduate courses while still an undergraduate does not guarantee admission into the M.A. program.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 13 term courses (incl senior req)

**Distribution of courses** 1 AFST course in humanities and 1 in social sciences; 2 years of African lang; 4 courses in area of concentration; 1 course that deepens the concentration or prepares the senior essay

**Specific course required** AFST 401

**Senior requirement** Senior essay (AFST 491)

**Substitution permitted** If language req is waived, 4 addtl African Studies courses

## African Studies Courses

\* **AFST 150a / HIST 409Ja, Global Black Power** Daniel Magaziner

The global dimension of black people's struggles for self-determination and authority from the late eighteenth century to the present. Various experiences of, and responses to, slavery, emancipation, segregation, scientific racism, and enlightenment democracy. The Haitian revolution, the Back to Africa movement, Garveyite nationalism, religious expression, African independence, armed revolution, and urban politics. WR, HU

**AFST 180b / ER&M 313b, Nigeria and Its Diaspora** Oluseye Adesola

Nigerians in the modern diaspora, both those who endured forced migration and those who migrated voluntarily. Specific reference to the Igbos and the Yorùbás. The preservation and maintenance of Nigerian culture, history, dance, literature, traditional education, theater, politics, art, music, film, religion, and folklore, especially in African American and Nigerian American contexts. SO

**AFST 188b / AFAM 178b / ER&M 278b / HSAR 378b, From West Africa to the Black Americas: The Black Atlantic Visual Tradition** Robert Thompson

Art, music, and dance in the history of key classical civilizations south of the Sahara—Mali, Asante, Dahomey, Yorùbá, Ejagham, Kongo—and their impact on New World art and music, especially rock, blues, North American black painting of the past ten years, and black artists of Cuba, Haiti, and Brazil. HU

**AFST 205b / LING 205b, Sociolinguistics** Staff

The relationship between language and society, with a focus on multilingual societies in Africa. Basic concepts and phenomena in sociolinguistics; language choice in multilingual contexts; language shift; birth, maintenance, and death of languages; effects of social factors such as age, sex, and social class on the linguistic choices made by members of a society. SO

**AFST 335b / HIST 335b, A History of South Africa** Daniel Magaziner

An introduction to the history of southern Africa, especially South Africa. Indigenous communities; early colonial contact; the legacies of colonial rule; postcolonial mismanagement; the vagaries of the environment; the mineral revolution; segregationist regimes; persistent inequality and crime since the end of apartheid; the specter of AIDS; postcolonial challenges in Zimbabwe, Angola, and Mozambique.

HU

**\* AFST 343a / MMES 401a, Postcolonialism in Africa and the Middle East** Staff

Examination of the major narrative and political preoccupations of postcolonial literature from Africa, the Middle East, and the diaspora. Focus on language, identity, gender, nationalism, colonialism, and migration. Authors include Equiano, Achebe, Dangarembga, Mernissi, Choukri, Hamidou Kane, and Fanon. WR, HU

**\* AFST 348b / MMES 291b / SOCY 232b, Islamic Social Movements**

Jonathan Wyrzten

Social movement and network theory used to analyze the emergence and evolution of Islamic movements from the early twentieth century to the present. Organization, mobilization, and framing of political, nonpolitical, militant, and nonmilitant movements; transnational dimensions of Islamic activism. Case studies include the Muslim Brotherhood, Hamas, Hizbollah, Al-Qaeda, Al-Adl wa-Ihsann, and Tablighi Jama'at. SO

**\* AFST 373b / GBLB 362b / MMES 282b / SOCY 339b, Imperialism, Insurgency, and State Building in the Middle East and North Africa** Jonathan Wyrzten

The historical evolution of political order from Morocco to Central Asia in the past two centuries. Focus on relationships between imperialism, insurgency, and state building. Ottoman, European, and nationalist strategies for state building; modes of local resistance; recent transnational developments; American counterinsurgency and nation-building initiatives in the region. SO

**AFST 381a / PLSC 381a, Government and Politics in Africa** Katharine Baldwin

The establishment and use of political power in selected countries of tropical Africa. The political role of ethnic and class cleavages, military coups, and the relation between politics and economic development. SO

**\* AFST 389b / GBLB 186b / MMES 181b / PLSC 389b, Middle East Exceptionalism**

Adria Lawrence

The Middle East and North Africa in comparative perspective. Evaluation of claims that the region's states are exceptionally violent, authoritarian, or religious. Themes include gender, Islam, nation and state formation, oil wealth, terrorism, and war. SO

\* **AFST 401a, Research Methods in African Studies** Cheryl Doss

Disciplinary and interdisciplinary research methodologies in African studies, with emphasis on field methods and archival research in the social sciences and humanities. Research methodologies are compared by studying recent works in African studies.

\* **AFST 408a / ENGL 340a / LING 121a, English as a World Language** Staff

The spread of the English language around the world and the pluralization of English into many varieties. Key topics, major concepts, theoretical issues, and current debates in the field of world Englishes. Historical and sociopolitical factors that account for the global spread of English; linguistic implications of that spread; models and frameworks for describing different varieties of English; linguistic and structural features of selected varieties. HU

\* **AFST 420a / EP&E 246a / LAST 406a / PLSC 430a, The Politics of Development Assistance** David Simon

Study of development assistance, a dominant feature of the political economies of some of the world's poorest countries. The motivations and politics of aid from donors' perspectives; the political and economic impact of aid on developing countries. Proposals to make aid a more effective instrument of development. SO

\* **AFST 430b, Language Planning in Sub-Saharan Africa** Kiarie Wa'Njogu

Examination of language policies in selected sub-Saharan African countries. Analysis of language use in different contexts; assessment of the impact of globalization on African languages. HU

\* **AFST 435a / THST 335a, West African Dance: Traditional to Contemporary**  
Lacina Coulibaly

A practical and theoretical study of the traditional dances of Africa, focusing on those of Burkina Faso and their contemporary manifestations. Emphasis on rhythm, kinesthetic form, and gestural expression. The fusion of modern European dance and traditional African dance. Admission by audition during the first class meeting. HU RP

\* **AFST 440a, Africa's Economic Transformation: Challenges and Prospects** Staff

The challenges of economic transformation in Africa. Topics include the economic potential of African countries, policy-making challenges in Africa, and possibilities for transforming African nations into middle-income countries. SO

\* **AFST 447b / EP&E 271b / ER&M 271b / PLSC 447b, The Rwandan Genocide in Comparative Context** David Simon

An examination of the 1994 Rwandan genocide: historical sources of the conflict, the motivations of the killers, actions and reactions of outside actors, efforts to reconstruct a post-genocide society, and continuation of the genocidal dynamic within the Great Lakes region. Consideration of other countries in similar situations, as well as other genocides in recent decades. SO

\* **AFST 464a / ECON 464a, The Economics of Africa** Cheryl Doss

Study of key microeconomic issues facing African economies and of the economic tools used to analyze such issues. Topics include infrastructure, land, agriculture, conflict, intrahousehold issues, health and education, microfinance and risk, and coping strategies. Readings from recent literature in microeconomic development. Prerequisites: intermediate microeconomics and econometrics. SO



\* **AFST 476b / AFAM 383b / FREN 376b, The Two Congos: Literature and Culture in the Heart of Africa** Christopher Miller

An interdisciplinary approach to two nations that share a name, a river, and elements of culture but that are divided by colonial heritage (one Belgian, one French). Emphasis on literature, with references to history, film, anthropology, art, politics, music, and sports. Views from outside the two countries (*Heart of Darkness*, *Tintin*, V.S. Naipaul) and inside (H. Lopes, V. Y. Mudimbe, A. Mabanckou, S. Mukasonga). The 1974 Ali-Foreman "Rumble in the Jungle" boxing match; Rwandan genocide in film and literature. Reading knowledge of French required. HU

\* **AFST 486a / HIST 388Ja, Slavery and the Slave Trade in Africa** Robert Harms

The slave trade from the African perspective. Analysis of why slavery developed in Africa and how it operated. The long-term social, political, and economic effects of the Atlantic slave trade. WR, HU

\* **AFST 490a, African Studies Colloquium** Staff

Students conduct research for the senior essay, give presentations on their research, and prepare a bibliography, a prospectus, and a draft chapter of the senior essay. Discussion of model essays and other examples of writing. HU, SO

\* **AFST 491a or b, The Senior Essay** Cheryl Doss

Independent research on the senior essay. By the end of the sixth week of classes, a rough draft of the entire essay should be completed. By the end of the last week of classes (fall term) or three weeks before the end of classes (spring term), two copies of the final essay must be submitted.

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## Kiswahili Courses

**SWAH 110a, Beginning Kiswahili I** Kiarie Wa’Njogu

A beginning course with intensive training and practice in speaking, listening, reading, and writing. Initial emphasis is on the spoken language and conversation. Credit only on completion of SWAH 120. L1 1½ Course cr

**SWAH 120b, Beginning Kiswahili II** Kiarie Wa’Njogu

Continuation of SWAH 110. Texts provide an introduction to the basic structure of Kiswahili and to the culture of the speakers of the language. Prerequisite: SWAH 110. L2 1½ Course cr

**SWAH 130a, Intermediate Kiswahili I** Staff

Further development of students’ speaking, listening, reading, and writing skills. Prepares students for further work in literary, language, and cultural studies as well as for a functional use of Kiswahili. Study of structure and vocabulary is based on a variety of texts from traditional and popular culture. Emphasis on command of idiomatic usage and stylistic nuance. After SWAH 120. L3 1½ Course cr

**SWAH 140b, Intermediate Kiswahili II** Staff

Continuation of SWAH 130. After SWAH 130. L4 1½ Course cr

**SWAH 150a, Advanced Kiswahili I** Kiarie Wa’Njogu

Development of fluency through readings and discussions on contemporary issues in Kiswahili. Introduction to literary criticism in Kiswahili. Materials include Kiswahili

oral literature, prose, poetry, and plays, as well as texts drawn from popular and political culture. After SWAH 140. L5

**SWAH 160b, Advanced Kiswahili II** Kiarie Wa’Njogu

Continuation of SWAH 150. After SWAH 150. L5

**SWAH 170a and SWAH 171b, Topics in Kiswahili Literature** Kiarie Wa’Njogu

Advanced readings and discussion with emphasis on literary and historical texts. Reading assignments include materials on Kiswahili poetry, Kiswahili dialects, and the history of the language. After SWAH 160. L5, HU

## Yoruba Courses

**YORU 110a, Beginning Yorùbá I** Oluseye Adesola

Training and practice in speaking, listening, reading, and writing. Initial emphasis is on the spoken aspect, with special attention to unfamiliar consonantal sounds, nasal vowels, and tone, using isolated phrases, set conversational pieces, and simple dialogues. Multimedia materials provide audio practice and cultural information. Credit only on completion of YORU 120. L1 1½ Course cr

**YORU 120b, Beginning Yorùbá II** Oluseye Adesola

Continuing practice in using and recognizing tone through dialogues. More emphasis is placed on simple cultural texts and role playing. Prerequisite: YORU 110. L2 1½ Course cr

**YORU 130a, Intermediate Yorùbá I** Oluseye Adesola

Refinement of students’ speaking, listening, reading, and writing skills. More natural texts are provided to prepare students for work in literary, language, and cultural studies as well as for a functional use of Yorùbá. After YORU 120. L3 1½ Course cr

**YORU 140b, Intermediate Yorùbá II** Oluseye Adesola

Students are exposed to more idiomatic use of the language in a variety of interactions, including occupational, social, religious, and educational. Cultural documents include literary and nonliterary texts. After YORU 130. L4 1½ Course cr

**YORU 150a, Advanced Yorùbá I** Oluseye Adesola

An advanced course intended to improve students’ aural and reading comprehension as well as speaking and writing skills. Emphasis on acquiring a command of idiomatic usage and stylistic nuance. Study materials include literary and nonliterary texts; social, political, and popular entertainment media such as movies and recorded poems (*ewi*); and music. After YORU 140. L5

**YORU 160b, Advanced Yorùbá II** Oluseye Adesola

Continuing development of students’ aural and reading comprehension and speaking and writing skills, with emphasis on idiomatic usage and stylistic nuance. Study materials are selected to reflect research interests of the students. After YORU 150. L5

**YORU 170a and YORU 171b, Topics in Yorùbá Literature and Culture**

Oluseye Adesola

Advanced readings and discussion concerning Yorùbá literature and culture. Focus on Yorùbá history, poetry, novels, movies, dramas, and oral folklore, especially from

Nigeria. Insight into Yorùbá philosophy and ways of life. Prerequisite: YORU 160. L5, HU

**YORU 180a and YORU 181b, Advanced Topics in Yorùbá Literature and Culture**

Oluseye Adesola

Designed for students with superior proficiency in Yorùbá who have an interest in topics not otherwise covered by existing courses. Development of language proficiency to the level of an educated native speaker. Discussion of advanced readings on Yorùbá philosophy, history, literature, and culture. L5

## Zulu Courses

**ZULU 110a, Beginning isiZulu I** Sandra Sanneh

A beginning course in conversational isiZulu, using Web-based materials filmed in South Africa. Emphasis on the sounds of the language, including clicks and tonal variation, and on the words and structures needed for initial social interaction. Brief dialogues concern everyday activities; aspects of contemporary Zulu culture are introduced through readings and documentaries in English. Credit only on completion of ZULU 120. L1 1½ Course cr

**ZULU 120b, Beginning isiZulu II** Sandra Sanneh

Development of communication skills through dialogues and role play. Texts and songs are drawn from traditional and popular literature. Students research daily life in selected areas of South Africa. Prerequisite: ZULU 110. L2 1½ Course cr

**ZULU 130a, Intermediate isiZulu I** Sandra Sanneh

Development of fluency in speaking, listening, reading, and writing, using Web-based materials filmed in South Africa. Students describe and narrate spoken and written paragraphs. Review of morphology; concentration on tense and aspect. Materials are drawn from contemporary popular culture, folklore, and mass media. After ZULU 120. L3 1½ Course cr

**ZULU 140b, Intermediate isiZulu II** Sandra Sanneh

Students read longer texts from popular media as well as myths and folktales. Prepares students for initial research involving interaction with speakers of isiZulu in South Africa and for the study of oral and literary genres. After ZULU 130. L4 1½ Course cr

## American Studies

Director of undergraduate studies: Kathryn Dudley, 233 HGS, 432-1188, [kathryn.dudley@yale.edu](mailto:kathryn.dudley@yale.edu); [americanstudies.yale.edu](http://americanstudies.yale.edu)

**FACULTY ASSOCIATED WITH THE PROGRAM OF AMERICAN STUDIES**

**Professors** Jean-Christophe Agnew (*History*), Elizabeth Alexander (*African American Studies, English*), Ned Blackhawk (*History*), David Blight (*History, African American Studies*), Hazel Carby (*African American Studies*), George Chauncey (*History*), Edward Cooke, Jr. (*History of Art*), Michael Denning (*English, Ethnicity, Race, & Migration*), Wai Chee Dimock (*English*), Kathryn Dudley (*Anthropology*), John Mack Faragher (*History*), Joanne Freeman (*History*), Glenda Gilmore (*History, African American Studies*), Inderpal Grewal (*Women's, Gender, & Sexuality Studies*), Dolores Hayden (*Architecture*), Jonathan Holloway (*African American Studies, History*), Amy Hungerford (*English*), Matthew

Jacobson (*African American Studies, History*), Kathryn Lofton (*Religious Studies*), Mary Lui (*History*), Joanne Meyerowitz (*History*), Charles Musser (*Film Studies*), Stephen Pitti (*History, Ethnicity, Race, & Migration*), Sally Promey (*Divinity School*), Joseph Roach (*English, Theater Studies*), Marc Robinson (*Theater Studies, English*), Michael Roemer (*Adjunct*) (*Film Studies, Art*), Alicia Schmidt Camacho (*Ethnicity, Race, & Migration*), Caleb Smith (*English*), Robert Stepto (*English, African American Studies*), Harry Stout (*Religious Studies, History*), Michael Veal (*Music, African American Studies*), John Warner (*History of Medicine*), Michael Warner (*English*), Laura Wexler (*Women's, Gender, & Sexuality Studies*)

**Associate Professors** Jafari Allen (*Anthropology, African American Studies*), Crystal Feimster (*African American Studies*), Zareena Grewal (*Ethnicity, Race, & Migration*), Paul Sabin (*History, Environmental Studies*)

**Assistant Professors** Laura Barraclough (*Ethnicity, Race, & Migration*), Greta LaFleur, Albert Laguna (*Ethnicity, Race, & Migration*), Dixia Ramirez (*Ethnicity, Race, & Migration*), Birgit Brander Rasmussen (*Ethnicity, Race, & Migration*), Jenifer Van Vleck (*History*), Tisa Wenger (*Divinity School*)

**Senior Lecturers** James Berger, Ron Gregg (*Film Studies*)

**Lecturers** Ryan Brasseaux, Christine Muller, Joel Silverman, Joseph Spooner

The American Studies program encourages the interdisciplinary study of the cultures and politics of the United States, the changing representations of national identity, and the construction of borderland and diasporic cultures over time. Each student in the major combines courses in American Studies with courses from other relevant disciplines (literature, history, the arts, and the social sciences) to explore these broad topics from local, national, and global perspectives. Through the selection of an area of concentration, each student develops a focus for course work in the major. The program encourages scholarly work in nontraditional combinations of disciplines; at the same time, however, it assumes and requires a substantial foundation of knowledge in the history and culture of the United States. Students interested in the major are encouraged to consult with the director of undergraduate studies as early as possible.

**Requirements of the major** All students majoring in American Studies must take fourteen term courses approved by the program's faculty. Although a good deal of freedom in course selection is permitted, it is expected that all students will acquaint themselves with the materials, skills, and perspectives of cultural studies. Accordingly, the major requires completion – preferably by the end of the sophomore year, but no later than the end of the junior year – of at least four gateway courses (AMST 111–299), including two in cultural history/cultural studies, one broad survey course in American literature, and one course preparatory for work in the student's area of concentration, to be selected in consultation with the director of undergraduate studies. One of these four courses must address material produced before the Civil War. An additional five concentration courses from diverse disciplines must be taken for a letter grade, one of which must incorporate a comparable topic from a non-U.S. perspective. Two electives chosen from the American Studies course offerings are also required.

Students must take two junior seminars (AMST 300–399) during their junior year. At least one of the seminars must fall within the student's area of concentration,

described below. In each of the seminars, students are expected to demonstrate proficiency in interdisciplinary research and analysis through the production of critical essays on primary source materials or a paper of fifteen to twenty pages. Sophomores contemplating a junior term abroad are urged to take one of the junior seminars in the spring term of their sophomore year.

**Area of concentration** Each American Studies major selects an area of concentration, normally in the fall of the junior year, from five possible choices: (1) national formations, (2) the international United States, (3) material cultures and built environments, (4) politics and American communities, and (5) visual, audio, literary, and performance cultures. The concentration in national formations explores historic migrations, settlements, and encounters among peoples who have formed the American nation, with an emphasis on Native American history and the construction of America's frontiers and borderlands. The international United States concentration focuses on historic and contemporary diasporas, the role of the United States outside its national borders, and the flows of American peoples, ideas, and goods throughout the globe. Students in the material cultures and built environments concentration examine the formation of the American landscape from the natural to the human-made, including the development of American architecture, and the visual and decorative arts. The concentration in politics and American communities investigates the emergence of social groups and their political struggles at the local and national levels, emphasizing the themes of power, inequality, and social justice. Majors with a concentration in visual, audio, literary, and performance cultures study American consumer culture, popular culture, representations, and media in relation to U.S. literatures. Students may also petition the director of undergraduate studies to develop an independent concentration.

**Senior requirement** During the senior year, each student in the major completes work in the area of concentration in one of three ways. First, the student may enroll in a senior seminar within the area of concentration (AMST 400–490). Students should apply interdisciplinary methods and undertake original research to produce a final paper of twenty to twenty-five pages. Students must complete all course requirements to fulfill the senior requirement.

Second, the student may complete a one-term senior project or essay (AMST 491). The product should be a thirty-page essay or its equivalent in another medium. All students writing a one-term senior essay participate in a proseminar on theory and method. To apply for admission to AMST 491, a student should submit a prospectus, signed by the faculty adviser, to the director of undergraduate studies.

Third, the student may enroll in the intensive major (AMST 493 and 494) and work independently for two terms. The intensive major offers an opportunity for significant original research leading to a substantial senior project. AMST 493, 494 carries two terms of credit; its final product should be a sixty-page essay or its equivalent in another medium. All students in the intensive major participate in a yearlong proseminar on theory and method. One term of the two-term project may count as a course in the area of concentration. To apply for admission to AMST 493 and 494, a student should submit a prospectus, signed by the faculty adviser, to the director of undergraduate studies.

As a multidisciplinary program, American Studies draws on the resources of other departments and programs in the University. The following list of courses is meant to be suggestive only: apart from those courses required for the major, it is neither restrictive nor exhaustive. Students are encouraged to examine the offerings of other departments in both the humanities and the social sciences, as well as residential college seminars, for additional relevant courses. The stated area of concentration of each student determines the relevance and acceptability of other courses.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 14 term courses (incl senior req)

**Distribution of courses** 4 gateway courses, as specified; 2 junior sems, 1 in area of concentration; 5 courses in area of concentration for letter grades, 1 on a related non-U.S. topic (one may be one term of two-term senior project); 2 electives

**Substitution permitted** 1 freshman sem for 1 gateway course; others with DUS permission

**Senior requirement** Senior sem (AMST 400–490) or one-term senior project (AMST 491) related to area of concentration

**Intensive major** Same, except a two-term senior project (AMST 493 and 494) replaces AMST 491

### Freshman Seminars

\* **AMST 002b / HIST 028b, American Consumer Culture in the Twentieth Century**

Jean-Christophe Agnew

An interdisciplinary introduction to twentieth-century American consumer culture, exploring the rise (and fall) of mass consumption and its impact on the experience of family, faith, citizenship, community, gender, race, ethnicity, and politics. The changing moral valuations of consumption; the effect of consumerism on ritual life; the Americanization of immigrants and the marketing of race and ethnicity; consumer culture's reciprocal relations with literature and the arts; the politics of consumer resistance; suburbanization; the consumer model of citizenship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **AMST 014a / HIST 007a, History of U.S.–Latin American Relations**

Jenifer Van Vleck and Taylor Jardno

Cultural history of the complicated relationship between the United States and Latin American and Caribbean countries, from Haitian independence in 1798 to the present. Themes include imperialism, political economy, tourism, migration, and ideologies of gender, race, and nation. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **AMST 016a / ENGL 012a / HUMS 052a, Literary Cities: New York, Chicago, San Francisco**

Wai Chee Dimock

An introduction to American literature, told through the vibrant lives, ethnic diversities, and innovative genres revolving around three urban centers. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **AMST 017a / ER&M 017a / HUMS 077a, Travel Literature of the Americas**

Dixa Ramirez

Evolving visions of the so-called New World from 1492 to the present. Readings from fictional and nonfictional accounts of travel to or throughout the Americas. Visual examples of travel narratives, including tourism ads; some attention to scholarly criticism. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **AMST 018a / AFAM 010a / ENGL 014a, Twentieth-Century African American**

**Poetry** Elizabeth Alexander

African American poetry from Paul Laurence Dunbar to the present, with special attention to the contemporary Black poetry renaissance. Works explored in the contexts of locale, history, and literary and cultural movements. Research conducted in the Beinecke Library's archives and in other archival collections at Yale. Includes attendance at poetry readings on campus, classroom visits by practicing poets in the contemporary canon, and a field trip to New York City. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU RP

\* **AMST 019a / HIST 018a, Commodities as U.S. History** Matthew Jacobson

American social, cultural, and political history introduced through study of the production, distribution, and consumption of common commodities. Topics include political economy, slavery, industrialization, labor, the rise of the corporation, the growth of the administrative and regulatory state, geopolitics, foreign policy, and cultural change. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. RP

\* **AMST 060a / AFAM 060a / HIST 016a, Significance of American Slavery**

Edward Rugemer

The history of American slavery, its destruction during the nineteenth century, and its significance today. Topics include the origins of slavery, the development of racism, the transatlantic slave trade, the experience of enslavement, resistance to slavery, the abolitionist movement, the process of emancipation, and the perpetuation of slavery and other forms of unfree labor in the twenty-first century. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

## Gateway Courses

**AMST 125a / AFAM 125a / HIST 136a, The Long Civil Rights Movement**

Crystal Feimster

Political, social, and artistic aspects of the U.S. civil rights movement from the 1920s through the 1980s explored in the context of other organized efforts for social change. Focus on relations between the African American freedom movement and debates about gender, labor, sexuality, and foreign policy. Changing representations of social movements in twentieth-century American culture; the politics of historical analysis.

HU

**AMST 131b / HIST 131b, American Politics and Society, 1900–1945** Glenda Gilmore

The social, political, and economic changes that transformed American society from the turn of the twentieth century through World War II. Progressive, radical, and conservative politics; war and society; the New Deal and federal social policy; race and

the long civil rights movement; consumerism, business, and labor; immigration and urban development. HU

**AMST 135a / HIST 127a / WGSS 200a, U.S. Lesbian and Gay History**

George Chauncey

Introduction to the social, cultural, and political history of lesbians, gay men, and other socially constituted sexual minorities. Focus on understanding categories of sexuality in relation to shifting normative regimes, primarily in the twentieth century. The emergence of homosexuality and heterosexuality as categories of experience and identity; the changing relationship between homosexuality and transgenderism; the development of diverse lesbian and gay subcultures and their representation in popular culture; religion and sexual science; generational change and everyday life; AIDS; and gay, antigay, feminist, and queer movements. HU

**\* AMST 136a / FILM 444a / WGSS 376a, Sexual Modernity and Censorship in American Film** Ronald Gregg

Romantic comedy, censorship, and the representation of sexual modernity in Hollywood film from the 1920s to the 1960s. Tensions between the studios' censorship code and émigré filmmakers' strategies to subvert it. Focus on the romantic comedies of Ernst Lubitsch and Billy Wilder, with some attention to the films of Cecil B. DeMille and Howard Hawks. HU RP

**AMST 141a / HIST 141a, The American West** John Mack Faragher

The history of the American West as both frontier and region, real and imagined, from the first contacts between Indians and Europeans in the fifteenth century to the multicultural encounters of the contemporary Sunbelt. Students work with historical texts and images from Yale's Western Americana Collection. HU

**AMST 160a / AFAM 160a / HIST 184a, The Rise and Fall of Atlantic Slavery**

Edward Rugemer

The history of peoples of African descent throughout the Americas, from the first African American societies of the sixteenth century through the century-long process of emancipation. HU

**AMST 163a / EVST 120a / HIST 120a / HSHM 204a, Introduction to Environmental History** Paul Sabin

Ways in which people have shaped and been shaped by the changing environments of North America from precolonial times to the present. Migration of species and trade in commodities; contrasting uses of land; the impact of industry and markets; the rise of modern conservation and environmental movements; the development of public policy; the global search for resources by the United States. HU

**AMST 191b / HIST 106b, The Formation of Modern American Culture, 1920 to the Present** Matthew Jacobson

An introduction to the cultural history of the United States in the modern and postmodern eras, with special attention to the development of the culture industries, the popular cultures of working peoples, and the political and social meanings of cultural conflict. HU

**AMST 193b / HIST 122b, Origins of U.S. Global Power** Jenifer Van Vleck

Policies, strategies, and ideas that enabled the United States to become a world power. Manifest Destiny, expansion, and empire; American exceptionalism; nationalism and internationalism; capitalism and consumer culture; technological innovation; the



relation between domestic politics and U.S. foreign policy, particularly with regard to race and gender; challenges and resistance to U.S. global power. Focus on the twentieth century, with introduction to critical moments in U.S. and international history during the seventeenth through nineteenth centuries. HU

**AMST 194b / AFAM 194b / ENGL 194b, African American Arts Today**

Elizabeth Alexander

The renaissance in African American culture from 1980 to the present. Great works of poetry, fiction, creative nonfiction, drama, film, music, dance, painting, photography, and hip-hop by living African American artists. Critical vocabularies and approaches with which to think about questions of genre; writing knowledgeably and persuasively about art across multiple genres and in historical context. Artists include Anna Deavere Smith, Suzan-Lori Parks, Toni Morrison, Edwidge Danticat, Colson Whitehead, Hilton Als, Rita Dove, Terrance Hayes, Bill T. Jones, Kerry James Marshall, Lorna Simpson, Jason Moran, and Jay-Z. Lectures feature public conversations with several of the artists studied. HU

**AMST 195a / RLST 195a, Religion and Technology** Kathryn Lofton

The effects of technological innovation on human life. History of Western technology and its interactive relationship with the history of religions. Focus on the religious meaning of technological innovations, with some attention to historical and material conditions that provide the necessary contexts for the machines, systems, and other technology in a given period. Readings from philosophical, historical, literary, and scientific sources. HU

**AMST 210a or b / ENGL 280a or b, Early American Literature to 1865** Greta LaFleur

Introduction to major genres, movements, historical periods, and themes in American literature from the seventeenth century to 1865. Early American cultural, sociopolitical, religious, colonial, and literary history; literary forms such as novels, poetry, essays, sermons, autobiography, and short stories. Authors include Douglass, Melville, Dickinson, Apess, Poe, Whitman, Paine, and Brockden Brown. HU

**AMST 211b / AFAM 140b / ENGL 293b / ER&M 210b / WGSS 211b, Race and Gender in American Literature** Birgit Rasmussen

The role of literature in constructing representations of America as an idea, a nation, a colonial settlement, and a participant in world affairs. What kind of place America is and who belongs there; the consequences of America's history for its national literature. Emphasis on the ways texts represent and contest social concepts of race and gender difference. WR, HU

**\* AMST 235a / ENGL 354a, Language, Disability, Fiction** James Berger

Portrayals of cognitive and linguistic impairment in modern fiction. Characters with limited capacities for language as figures of "otherness." Contemporaneous discourses of science, sociology, ethics, politics, and aesthetics. The ethics of speaking about or for subjects at the margins of discourse. HU

**AMST 247a / FILM 244a / HIST 147a / HLTH 170a / HSHM 202a, Media and Medicine in Modern America** John Warner and Gretchen Berland

Relationships between medicine, health, and the media in the United States from 1870 to the present. The changing role of the media in shaping conceptions of the body, creating new diseases, influencing health and health policy, crafting the image

of the medical profession, informing expectations of medicine and constructions of citizenship, and the medicalization of American life. HU

\* **AMST 257a, Modern Apocalyptic Narratives** James Berger

The persistent impulse in Western culture to imagine the end of the world and what might follow. Social and psychological factors that motivate apocalyptic representations. Differences and constant features in apocalyptic representations from the Hebrew Bible to contemporary science fiction. Attitudes toward history, politics, sexuality, social class, and the process of representation in apocalyptic texts. HU

\* **AMST 258b / EVST 258b, Wilderness in the North American Imagination**

Sigma Colon

The idea of wilderness in American history, art, film, public policy, and literature, from the Puritans to the present. Authors include Thoreau, Faulkner, Jack London, Mary Rowlandson, Aldo Leopold, and Rachel Carson. A weekend field trip is held early in the term. HU

**AMST 261b / ENGL 291b, The American Novel since 1945** Amy Hungerford

American fiction; works by Richard Wright, Flannery O'Connor, Jack Kerouac, Vladimir Nabokov, Philip Roth, Thomas Pynchon, John Barth, Maxine Hong Kingston, Toni Morrison, Cormac McCarthy, Lev Grossman, Alison Bechdel, and Junot Diaz. HU

## Junior Seminars

\* **AMST 306a / FILM 469a, The Films of Martin Scorsese** Michael Kerbel

Close analysis of Scorsese's films, with attention to his themes and styles and to ways in which his works have assimilated literary and cinematic influences, reflected their eras, and influenced other directors. Scorsese's work examined in the context of film history, and of U.S. culture and history, from the 1960s to the present. HU RP

\* **AMST 307b, Sports, Civil Rights, and American Leadership** Joseph Spooner

Relations among sports, civil rights movements, and the evolution of American leadership values in the twentieth century. The American sports hero and the struggle for equality of race, gender, and sexual orientation; the cultural effects of major sports phenomena on ideas of leadership and social change. Attention to intellectual and cultural history, literature, and film. Case studies based on key sporting figures and events.

\* **AMST 310b / AFAM 410b / WGSS 410b, Interdisciplinary Approaches to African American Studies** Jafari Allen

An interdisciplinary, thematic approach to the study of race, nation, and ethnicity in the African diaspora. Topics include class, gender, color, and sexuality; the dynamics of reform, Pan-Africanism, neocolonialism, and contemporary black nationalism. Use of a broad range of methodologies. WR, HU, SO

\* **AMST 314a / WGSS 306a, Gender and Transgender** Greta LaFleur

Introduction to transgender studies, an emergent field that draws on gender studies, queer theory, sociology, feminist science studies, literary studies, and history. Representations of gender nonconformity in a cultural context dominated by a two-sex model of human gender differentiation. Sources include novels, autobiographies, films, and philosophy and criticism. RP

\* **AMST 315b / ER&M 312b, Colonial Visions and Contemporary Revisions**

Birgit Rasmussen

American literature from the colonial period paired with contemporary texts to examine how contemporary writers use, critique, revise, or speak back to colonial narratives. Contemporary authors include Eduardo Galeano, Toni Morrison, and Arthur Miller, who revisit histories of conquest, enslavement, and settler colonialism. HU RP

\* **AMST 316a / FILM 372a, Los Angeles Culture and the 1960s** Joshua Glick

Representations of Los Angeles by the city's artists, journalists, filmmakers, poets, and musicians from the late 1950s through the early 1970s. LA's social geography, its overlapping minority communities, and its high-tech, popular-arts, information, and military industries. Focus on the relationships between different kinds of media and on the international resonance of culture created within Los Angeles. HU

\* **AMST 318a / HIST 415Ja, The Problem of Global Poverty** Joanne Meyerowitz

Large-scale plans to end world poverty from 1960 to the present, from modernization to microcredit. Topics include the green revolution, population control, the "women in development" movement, and the New International Economic Order. Extensive work with primary sources. May count toward geographical distributional credit within the History major for any region studied, upon application to the director of undergraduate studies. WR, HU

\* **AMST 319a / FILM 427a, American Documentary Films** Michael Roemer

The documentary film from Flaherty to cinéma-vérité and beyond. Films examined for aesthetic value as well as social and political relevance. Emphasis on individual films and filmmakers. Screenings in class. Enrollment limited to juniors and seniors majoring in American Studies or in Film Studies. HU RP

\* **AMST 322b / ER&M 323b / WGSS 371b, Modern Families, Identities, and Cultures in Asia and the United States** Geetanjali Chanda

A cross-cultural dialogue focusing on family, gender, and identity. Exploration of how specific Asian countries and people approach issues of religion, dress, education, and food as identity markers; U.S. perceptions and reactions to similar issues. WR, HU

\* **AMST 326b / AFAM 349b / WGSS 388b, Civil Rights and Women's Liberation**

Crystal Feimster

The dynamic relationship between the civil rights movement and the women's liberation movement from 1940 to the present. When and how the two movements overlapped, intersected, and diverged. The variety of ways in which African Americans and women campaigned for equal rights. Topics include World War II, freedom summer, black power, the Equal Rights Amendment, feminism, abortion, affirmative action, and gay rights. HU

\* **AMST 330b / ENGL 236b, Dystopic and Utopian Fictions** James Berger

Attempts since the late nineteenth century to imagine, in literature, cinema, and social theory, a world different from the existing world. The merging of political critique with desire and anxiety; the nature and effects of social power; forms of authority, submission, and resistance. HU

\* **AMST 335b / AFAM 428b / THST 406b, Dance and Black Popular Culture** Staff  
Approaches to theorizing performance, in particular dance performance of a black diaspora. Uncovering methodologies pertinent to the discovery and analysis of dance performance, intersections of black popular culture, and concepts of the corporeal. HU

\* **AMST 336b / AFAM 336b / ER&M 315b, Haitian and Dominican Literature and Culture** Dixia Ramirez

The literature and culture of Haiti, the Dominican Republic, and their diasporas in the United States and Canada since 1804. Focus on texts that explore relations between the two nations, with some attention to each country's individual literary and cultural traditions. Conventional literary texts such as novels and poetry, as well as political documents, orally transmitted texts, and imagery. HU

\* **AMST 337a / AFAM 324a / ER&M 314a, Urban Latina/o Cultures** Dixia Ramirez  
Latina/o urbanism as expressed in literature and culture. Focus on the twentieth and twenty-first centuries, with background on the formation of Latina/o communities in the nineteenth century. Sources include film and the visual arts. HU

\* **AMST 346a / ENGL 033b, American Literature in the World** Wai Chee Dimock  
American literature as a gateway to the rest of the world. Key texts from the eighteenth century to the twenty-first, including works by Olaudah Equiano, Thomas Jefferson, Gertrude Stein, James Baldwin, Monique Truong, Ruth Ozeki, Jhumpa Lahiri, Barbara Kingsolver, Agha Shahid Ali, Cristina Garcia, Junot Diaz, and Dave Eggers. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.  
WR, HU

\* **AMST 348a, Space, Place, and Landscape** Laura Barraclough  
Survey of core concepts in cultural geography and spatial theory. Ways in which the organization, use, and representation of physical spaces produce power dynamics related to colonialism, race, gender, class, and migrant status. Multiple meanings of home; the politics of place names; effects of tourism; the aesthetics and politics of map making; spatial strategies of conquest. Includes field projects in New Haven. SO

\* **AMST 364b / EVST 366b / FILM 423b, Documentary and the Environment**  
Charles Musser

Survey of documentaries about environmental issues, with a focus on *Darwin's Nightmare* (2004), *An Inconvenient Truth* (2006), *Food, Inc.* (2009), *GasLand* (2010), and related films. Brief historical overview, from early films such as *The River* (1937) to the proliferation of environmental film festivals. HU RP

\* **AMST 366a / ENGL 419a / THST 355a, Modernism and American Theater**  
Marc Robinson

Examination of modernist principles as they are adapted to, and tested in, American theater. Playwrights include Eugene O'Neill, Gertrude Stein, e. e. cummings, Djuna Barnes, Mae West, Thornton Wilder, Tennessee Williams, Jane Bowles, and Frank O'Hara.

\* **AMST 370b / THST 380b, The History of Dance** Emily Coates

An examination of major movements in the history of concert and social dance from the late nineteenth century to the present, including ballet, tap, jazz, modern, musical theater, and different cultural forms. Topics include tradition versus innovation, the

influence of the African diaspora, and interculturalism. Exercises are used to illuminate analysis of the body in motion. WR, HU

\* **AMST 375b / FILM 375b / WGSS 375b, LGBTQ Cinema** Ronald Gregg

An introduction to queer film history. Focus on LGBTQ representation in Hollywood and experimental film from its beginning to the present, placed in social and political context. Topics include the impact of censorship, codes used to connote homosexuality, and how gay and antigay politics have affected representation. HU

\* **AMST 381a / ARCH 351a, Poets' Landscapes** Dolores Hayden

Introduction to techniques poets have used to ground their work in the landscapes and buildings of American towns and cities including Chicago, New York, and Los Angeles. Attention to poems from a national automotive landscape as well as narrative poems about cities. Writing exercises in different poetic forms; readings from the works of Dickinson, Frost, Bishop, Lowell, Wilbur, Dickey, Pinsky, Cervantes, and Merrill. WR, HU

\* **AMST 382a, Culture of the Early Cold War** Joel Silverman

U.S. history and culture from the end of World War II through the 1950s. Ways in which Americans made sense of their world. The formation of American identity after World War II, with emphasis on the construction of gender identity. Texts include novels, short stories, essays, film, advertisements, and music. HU

\* **AMST 383b / ER&M 384b, U.S. Border and Immigration Policy** Laura Barraclough

U.S. border and immigration policies at the national, state, and local levels from the colonial period to the present. The historical evolution of border and immigration policy; contemporary debates; the effects of shifting policy on immigrants of varying legal statuses. SO RP

\* **AMST 385b, Trauma in American Film and Television** Christine Muller

Origins, multiple meanings, and influence of the notion of trauma in contemporary American culture. Relations between theories of popular culture and of trauma, particularly in discussions of war, social upheaval, and September 11, 2001. The conditions and implications of engaging trauma through everyday entertainment such as film and television; the ethics of representation. HU

\* **AMST 392b / RLST 311b, Religion and Popular Culture** Kathryn Lofton

Study of the religious dimensions of popular culture. Religious institutions' engagement in economic markets; the deployment of religious imagery in the cultural marketplace; consumer culture as a religious space. HU

\* **AMST 397b / AFAM 251b, Critical Race Theory** Crystal Feimster

Introduction to critical race theory, a radical critique of relations among race, law, and power in U.S. politics and society. Intellectual foundations of the field, with emphasis on African American perspectives; key juridical acts. The centrality of U.S. law in producing social hierarchies of race and racial difference, gender, sexuality, and class. The extension of critical race theory to global analysis of race, immigration, and cultural difference.

## Senior Seminars

\* **AMST 402a / ANTH 302a / FILM 324a / WGSS 380a, Gender and Sexuality in Media and Popular Culture** Laura Wexler

Investigation of visual media and popular culture in the United States and transnationally. Gender, race, class, and sexuality in relation to the production, circulation, consumption, and reception of media culture. Focus on theories of media and the visual. Significant lab component in which students use media technologies to make and illustrate theoretical arguments. HU

\* **AMST 403a, Introduction to Public Humanities** Ryan Brasseaux

Introduction to the various media, topics, debates, and issues framing public humanities. The relationship between knowledge produced in the university and the circulation of ideas among a broader public, including modes of inquiry, interpretation, and presentation. Public history, museum studies, oral and community history, public art, documentary film and photography, public writing and educational outreach, and the socially conscious performing arts. HU

\* **AMST 407a / AFAM 380a / HIST 111Ja, Antebellum America** Edward Rugemer

History of the United States from the Jackson administration through the Civil War. Emphasis on race, slavery, and the coming of the war, with some attention to western expansion. WR, HU

\* **AMST 416b / FILM 438b, U.S. Cinema from 1960 to the Mid-1970s**

Michael Kerbel

An examination of significant developments in American narrative cinema from 1960 to the mid-1970s through close analysis of representative films. The decline of the studio system; Hollywood's departures from traditional genres, themes, structures, and styles; the treatment of previously forbidden subjects; the influence of avant-garde, documentary, and international film; the director's ascendance; representations of race, ethnicity, gender, and sexuality; relations between films and American politics, society, and culture. HU RP

\* **AMST 426a / AFAM 411a / ER&M 413a / WGSS 411a, Fictions of Imaginary and Imminent Futures** Hazel Carby

Ways in which creative artists can imagine and reimagine definitions of the human, through hybridity, crossing the boundaries of species being, contesting ideas of racialized bodies, expanding the possibilities of genders and sexualities, and questioning the relationship between biology, technology, and the body. Focus on an international range of literature, novels, and short stories in the genre of science and speculative fiction, as well as various forms of futurism in visual and sonic culture. HU

\* **AMST 435a / ANTH 366a, Anthropology of Inequality in America** Chloe Taft

Sociocultural dimensions of social inequality in the contemporary United States. Ways in which the socioeconomic processes that produce inequality are inextricably embedded in worlds of cultural meaning; how those meanings are constructed and embodied in everyday practice. Perspectives from anthropology, sociology, economics, history, and popular media. SO

\* **AMST 440b, Twentieth-Century American Culture and Politics in the World**

Talya Zemach-Bersin

The cultural and political history of America's relationship to the world across the long twentieth century. The production of U.S. interests globally; ways in which politics and culture intersect to shape how the United States engages with, and understands itself in relation to, the world. Topics include imperialism, humanitarianism, global imaginaries, cultural expansion, wars and interventionism, race, gender, and religion. HU

\* **AMST 441b / HIST 130Jb, Indians and the Spanish Borderlands** Ned Blackhawk

The experiences of Native Americans during centuries of relations with North America's first imperial power, Spain. The history and long-term legacies of Spanish colonialism from Florida to California. WR, HU

\* **AMST 449a / HSAR 467a / WGSS 451a, Photography and Memory: Public and Private Lives** Laura Wexler

The role of photographic representation in archives of public and private memory. The social and expressive functions of photography under the aegis of museums, libraries, art galleries, government, police, and personal albums. Critical theory on gender, race, ethnicity, sexuality, class, and nation as they help construct remembering. HU

\* **AMST 457a / HIST 113Ja, Cultural Capital: New York in the Twentieth Century**

Jean-Christophe Agnew

An interdisciplinary study of New York City as a global cultural capital in the twentieth century. Social, political, and economic forces shaping the principal institutions of the city's patrician, popular, and mass cultures. The formation of identifiably "New York" styles in the arts, architecture, photography, literature, and film. The changing geography of cultural creation, reproduction, and distribution in the city. WR, HU

\* **AMST 460a / AFAM 408a / ENGL 443a, African American Poets of the Modern Era**

Robert Stepto

The African American practice of poetry between 1900 and 1960, especially of sonnets, ballads, sermonic, and blues poems. Poets include Paul Laurence Dunbar, Langston Hughes, Sterling Brown, Gwendolyn Brooks, Margaret Walker, and Robert Hayden. Class sessions at the Beinecke Library for inspection and discussion of original editions, manuscripts, letters, and other archival material. HU

\* **AMST 463a and AMST 464b / FILM 455a and FILM 456b, Documentary Film Workshop** Charles Musser

A yearlong workshop designed primarily for majors in Film Studies or American Studies who are making documentaries as senior projects. Seniors in majors other than Film Studies and American Studies admitted as space permits. RP

\* **AMST 466a / ENGL 444a, Contemporary Historical Novels** James Berger

Attempts of contemporary American authors to put the complexities of history into written form. Narrative as the privileged mode of historical representation; differences between what is regarded as academic history, popular history, and historical fiction; the influence of power and of the writer's own historical position on historical narrative; effects of ethnicity, gender, and race on the creation and reception of history; writers' use of historical fiction to change the ways readers think about the present and the future. HU

\* **AMST 467a / ER&M 415a, Investigating the Present** Alicia Camacho

An interdisciplinary approach to the processes of social documentation, as practiced in the fields of cultural and ethnic studies. The challenges of representing ongoing social processes with authority and integrity; writing as a social act; methods for developing a contemporary archive. Readings from the works of authors whose narratives cross the boundary between scholarship and literature. HU

\* **AMST 480b / HIST 422Jb, Theories of History** Greta LaFleur

Critical, philosophical, and theoretical survey of history as an idea and a practice. The intellectual genealogy behind the historiographic practices used and discussed most often in contemporary scholarship, including new historicism and queer historiography. The problem of describing the nature, uses, and abuses of history. Readings from works by Socrates, Hegel, Marx, Freud, Benjamin, Foucault, Scott, White, Said, and Spivak.

\* **AMST 483a, Urban Public Spaces** Laura Barraclough

The production, representation, use, and transformation of urban public spaces, with a focus on the contemporary United States. Relations to evolving practices of citizenship, the workings of democracy, and dynamics of power. Meanings of public space for community and everyday life; power and resistance; art, theater, and performance; the work of community organizations. Includes field projects in New Haven. SO

## Senior Project

\* **AMST 491a or b, Senior Project** Alison Kanosky

Independent research and proseminar on a one-term senior project. For requirements see under "Senior requirement" in the American Studies program description.

\* **AMST 493a and AMST 494b, Senior Project for the Intensive Major**

Alison Kanosky

Independent research and proseminar on a two-term senior project. For requirements see under "Senior requirement" in the American Studies program description.

## Anthropology

Director of undergraduate studies: William Kelly, Rm. 201, 10 Sachem St., 432-3688, [william.kelly@yale.edu](mailto:william.kelly@yale.edu) [F]; Kalyanakrishnan Sivaramakrishnan, Rm. 128, 10 Sachem St., 432-3684, [kalyanakrishnan.sivaramakrishnan@yale.edu](mailto:kalyanakrishnan.sivaramakrishnan@yale.edu), [Sp]; [anthropology.yale.edu](http://anthropology.yale.edu)

### FACULTY OF THE DEPARTMENT OF ANTHROPOLOGY

**Professors** Richard Bribiescas (*Chair*), Richard Burger, † Michael Dove, Kathryn Dudley, J. Joseph Errington, Eduardo Fernandez-Duque, † Inderpal Grewal, Andrew Hill, Marcia Inhorn, William Kelly, Paul Kockelman, Roderick McIntosh, Catherine Panter-Brick, Eric Sargis, † James Scott, Helen Siu, Kalyanakrishnan Sivaramakrishnan, Anne Underhill, Claudia Valeggia, David Watts, † Harvey Weiss

**Associate Professors** Jafari Allen, Brenda Bradley, William Honeychurch, Karen Nakamura, Douglas Rogers

**Assistant Professors** Sean Brotherton, Oswaldo Chinchilla, Narges Erami, Erik Harms, Karen Hébert, Louisa Lombard, Brian Wood



**Senior Lecturer** † Carol Carpenter

† A joint appointment with primary affiliation in another department or school.

The major in Anthropology gives a firm grounding in this comparative discipline concerned with human cultural, social, and biological diversity. Anthropology deals not only with that small proportion of humankind in Europe and North America but with societies of the entire world, from the remotest past to the present day. It is thus an essential part of a sound liberal education, helping us to see our world from a perspective that challenges ethnocentric assumptions. The major in Anthropology covers the evolution of human and nonhuman primates and the evolutionary biology of living people; world prehistory and the emergence of civilization; diversity and commonality in social organization and culture; the importance of culture for understanding such topics as sickness and health, gender and sexuality, environment and development, media and visual culture, urban life and sport, economic organization and politics, law and society, migration, and religion; and language use as cultural behavior.

The subfields of anthropological inquiry—archaeology, biological anthropology, sociocultural anthropology, and linguistic anthropology—together offer a holistic perspective on humankind and its development.

**Requirements of the major** Students are required to present twelve course credits toward their major. At least eight term courses must be taught in the Yale Department of Anthropology. These eight must include an introductory or intermediate course (numbered ANTH 001–299) in each of at least three subfields of anthropology, a senior essay course, three advanced courses (numbered ANTH 300–470 or 473–490, not including a senior essay seminar), and one elective. The major does not have formal tracks, but majors may choose to concentrate in one of the subfields of anthropology. They may also draw on courses in sociocultural and biological anthropology to pursue a concentration in medical anthropology. Those who concentrate in sociocultural anthropology are strongly encouraged to take a course in ethnographic methods and one in anthropological theory (e.g., ANTH 303 or 311). Those who concentrate in biological anthropology are strongly encouraged to take courses that give them hands-on experience working with material used in the study of human and nonhuman primate anatomy and evolution and that introduce them to laboratory methods.

Three term courses related to anthropology may be selected from other departments, with approval by the director of undergraduate studies. Majors are not required to present such cognate courses, but those who do should choose courses that expand their knowledge in one of the subfields of anthropology or in an area of cross-disciplinary concentration. For example, cognate courses for biological anthropology can be found in Ecology and Evolutionary Biology (p. 239), Geology and Geophysics (p. 363), Psychology (p. 597), and Forestry & Environmental Studies (p. 343); cognates for sociocultural anthropology can be found in Sociology (p. 629), American Studies (p. 105), History (p. 399), and international and area studies. Appropriate areas of cross-disciplinary concentrations include such topics as area studies (e.g., Africa); anthropological approaches to law, environment, and health; gender and sexuality studies; evolutionary biology; and geology.

With permission of the director of undergraduate studies, students may apply up to four courses taken outside Yale as electives toward the Anthropology major. Such courses must have been approved for Yale College credit and may include courses taken on a Year or Term Abroad (p. 63) or through summer study at another college or university.

**Credit/D/Fail** A maximum of one course taken Credit/D/Fail may be applied toward the Anthropology major.

**Graduate courses** Most graduate seminars in anthropology are open to qualified undergraduates. Descriptions are available in the departmental office, 10 Schem St. Permission of the instructor and of the director of graduate studies is required.

**Senior essay** All majors are required to complete a substantial paper during the senior year, either in a seminar or in ANTH 491. There are three options for completing the senior essay. First, students can write a paper for an advanced seminar. A seminar senior essay must be more substantial than a typical term paper and is expected to be 20–25 pages long. It is evaluated by the seminar instructor and a second reader drawn from the Yale faculty. Students must obtain written approval for this option from the seminar instructor no later than the third week of the term. Students fulfilling the requirements of two majors may not apply a single seminar essay toward the senior requirement for both majors. The deadline for a seminar senior essay is the senior essay deadline, not the term paper deadline. Students choosing this option must take the seminar for which they write their essay in addition to the three advanced courses required for the major.

The second option for the senior essay is an independent essay on a subject of the student's choice, completed in ANTH 491. A student pursuing this option must choose a topic and identify a faculty adviser by the end of the third week of the term in which the essay is to be written. By the same date, the adviser must approve a prospectus that outlines the topic, objectives, and methods of the essay, as well as a preliminary bibliography. The student should also inform the director of undergraduate studies of a preferred second reader by this time. The adviser must have a faculty appointment in Anthropology, and the second reader must have a faculty appointment at Yale.

The third option for the senior essay is a yearlong paper, begun in ANTH 471 or 472 and completed in ANTH 491. The yearlong essay is designed for students who wish to pursue more extensive independent projects than can be completed in a single term. Students must have their project approved by a faculty adviser who establishes the requirements for ANTH 471 or 472; approval is required before the student registers for ANTH 471 or 472, typically in the fall term of the senior year.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 course credits (incl senior req)

**Distribution of courses** At least 1 intro survey or intermediate course in each of 3 subfields; 3 advanced courses (not incl senior essay sem); up to 3 cognate courses in other depts or programs with DUS approval

**Senior requirement** Senior essay in advanced sem or ANTH 491

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## Courses

**\* ANTH 011b, Reproductive Technologies** Marcia Inhorn

Introduction to scholarship on the anthropology of reproduction. Focus on reproductive technologies such as contraceptives, prenatal diagnostics, childbirth technologies, abortion, assisted reproduction, surrogacy, and embryonic stem cells. The globalization of reproductive technologies, including social, cultural, legal, and ethical responses. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO  
Anthropology: Sociocultural

**\* ANTH 012b, Exploring Sport, Society, and Culture** William Kelly

Introduction to critical sport studies. Exploration of the nature of sports, the emergence of modern sports, and implications of sports for health, technology, ethics, gender, sexuality, class, race, nationalism, and globalization. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR  
Anthropology: Sociocultural

**\* ANTH 030b / ARCG 030b / LAST 030b, Inca Culture and Society** Richard Burger

History of the Inca empire of the Central Andes, including the empire's impact on the nations and cultures it conquered. Overview of Inca religion, economy, political organization, technology, and society. Ways in which different schools of research have approached and interpreted the Incas over the last century, including the influence of nationalism and other sources of bias on contemporary scholarship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO  
Anthropology: Archaeology

**\* ANTH 040b, The Evolution of Human Uniqueness** David Watts

Current ideas in anthropology about what facilitated the evolutionary success of *Homo sapiens* and what distinguishes humans from other primates. The fossil and archaeological records for human evolution and the evolution of social behavior; research on nonhuman primate behavior and cognitive abilities, with an emphasis on chimpanzees; insights and limitations of comparative primate research. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO  
Anthropology: Biological

**ANTH 110b, An Introduction to Cultural Anthropology** Staff

Anthropological study of cosmology, tacit knowledge, and ways of knowing the world in specific social settings. Ways in which sociocultural specificity helps to explain human solutions to problems of cooperation and conflict, production and reproduction, expression, and belief. Introduction to anthropological ways of understanding cultural difference in approaches to sickness and healing, gender and sexuality, economics, religion, and communication. SO  
Anthropology: Sociocultural

**ANTH 112a, Agent, Person, Subject, Self** Staff

Introduction to the interconnections between language and personality development and to the social construction of person and self. Focus on the capacities of agency, subjectivity, selfhood, and personhood as analyzed in classic works from anthropology, psychology, and philosophy. Ways in which these seemingly human-specific and individual-centric capacities are essential for understanding social processes. SO

Anthropology: Linguistic

**ANTH 116a, Introduction to Biological Anthropology** David Watts

Introduction to human and primate evolution, primate behavior, and human biology. Topics include a review of principles of evolutionary biology and basic molecular and population genetics; the behavior, ecology, and evolution of nonhuman primates; the fossil and archaeological record for human evolution; the origin of modern humans; biological variation in living humans; and the evolution of human behavior. SC, SO  
Anthropology: Biological

**ANTH 169a, Anthropological Approaches to Sex** Karen Nakamura

The analytical concept of sex explored using theories and methods from archaeology and from biological, sociocultural, and linguistic anthropology. Sexual morphology and behavior; constructions of sex and gender; gendered violence, power, and language; kinship and mating. SO

**ANTH 171b / ARCG 171b, Great Civilizations of the Ancient World** Anne Underhill

A survey of selected prehistoric and historical cultures through examination of archaeological sites and materials. Emphasis on the methodological and theoretical approaches by which archaeologists recover, analyze, and interpret the material remains of the past. SO

Anthropology: Archaeology

**ANTH 172a / ARCG 172a, Great Hoaxes and Fantasies in Archaeology**

William Honeychurch

Examination of selected archaeological hoaxes, cult theories, and fantasies; demonstration of how archaeology can be manipulated to authenticate nationalistic ideologies, religious causes, and modern stereotypes. Examples of hoaxes and fantasies include the lost continent of Atlantis, Piltdown man, ancient giants roaming the earth, and alien encounters. Evaluation of how, as a social science, archaeology is capable of rejecting such interpretations about the past. SO

Anthropology: Archaeology

**ANTH 182a, Primate Ecology and Social Behavior** Staff

Socioecology of primates compared with that of other mammals, emphasizing both general principles and unique primate characteristics. Topics include life-history strategies, feeding ecology, mating systems, and ecological influences on social organization. SO

Anthropology: Biological

**ANTH 232b / ARCG 232b / LAST 232b, Ancient Civilizations of the Andes**

Richard Burger

Survey of the archaeological cultures of Peru and Bolivia from the earliest settlement through the late Inca state. SO

Anthropology: Archaeology

**\* ANTH 234b / WGSS 234b, Disability and Culture** Karen Nakamura

Exploration of disability from a cross-cultural perspective, using examples from around the globe. Disability as it relates to identity, culture, law, and politics. Case studies may include deafness in Japan, wheelchair mobility in the United States, and mental illness in the former Soviet republics. SO RP

Anthropology: Sociocultural

**ANTH 237a, Smuggling, Trafficking, and the Criminal Act** Narges Erami

Theories and ethnographies of marginal, hidden, secret, and invisible economies. How governments deal with illicit and criminal behavior that trespasses national boundaries. Focus on transnational smuggling rings for which the difference between legal and illegal commercial activities is blurred. Additional topics include human trafficking, prostitution, counterfeiting, drugs, and pirated music. SO

Anthropology: Sociocultural

**ANTH 240b, Health of Indigenous Peoples** Staff

Exploration of the current health status of indigenous populations around the world. Epidemiological profiles; causes of health disparities, including the role of globalization and market integration; the current surge of global health programs at academic and research institutions; whether the health situation of indigenous populations is unique.

SO

Anthropology: Sociocultural

**ANTH 242b, Human Evolutionary Biology and Life History** Richard Bribiescas

The range of human physiological adaptability across environments and ecologies. Effects of energetic constraints on growth, reproduction, and behavior within the context of evolution and life history theory, with special emphasis on traditional non-Western societies. SC, SO

Anthropology: Biological

**\* ANTH 245b / EVST 250b, Nature and Globalization** Karen Hébert

Examination of contemporary human relations to nature in light of global economic transformation. Case studies explore changes in the production and consumption of food, agriculture, and natural resources; the politics of environmental conservation; and the rise of new techno-natures and risks. SO

Anthropology: Sociocultural

**ANTH 254a, Japan: Culture, Society, Modernity** William Kelly

Introduction to Japanese society and culture. The historical development of Japanese society; family, work, and education in contemporary Japan; Japanese aesthetics; and psychological, sociological, and cultural interpretations of Japanese behavior. WR, SO

Anthropology: Sociocultural

**ANTH 257a / GBL 221a / HLTH 260a, Biocultural and Ecological Perspectives on Global Health** Catherine Panter-Brick

Overview of the biological, social, individual, and structural determinants of health in the Western and non-Western world. Health, well-being, health care systems, and health-seeking behaviors situated in their broader ecological, biomedical, social, economic, political, and moral contexts. Critical perspectives on local and global approaches to understanding health problems and health interventions. SO

Anthropology: Sociocultural

**ANTH 267b / ARCG 267b, Human Evolution** Andrew Hill

Examination of the fossil record of human evolution, including both paleontological and archaeological evidence for changes in hominid behavior during the Pleistocene. Prerequisite: an introductory course in biological anthropology or biology. SO

Anthropology: Biological

**ANTH 276a / SAST 219a, South Asian Social Worlds** Staff

Study of a series of texts that introduce anthropological and critical approaches to South Asia's peoples and cultures while questioning the historical and political possibility of understanding such a diverse region. WR, SO  
 Anthropology: Sociocultural

**ANTH 280b, Evolution of Primate Intelligence** David Watts

Discussion of the extent and evolutionary origins of cognitive abilities in primates (prosimians, monkeys, apes, and humans). Topics include the role of ecological and social factors as evolutionary forces; "ape language" studies; and whether any nonhuman primates possess a "theory of mind." SO  
 Anthropology: Biological

**\* ANTH 302a / AMST 402a / FILM 324a / WGSS 380a, Gender and Sexuality in Media and Popular Culture** Laura Wexler

Investigation of visual media and popular culture in the United States and transnationally. Gender, race, class, and sexuality in relation to the production, circulation, consumption, and reception of media culture. Focus on theories of media and the visual. Significant lab component in which students use media technologies to make and illustrate theoretical arguments. HU  
 Anthropology: Sociocultural

**\* ANTH 308b / WGSS 308b, Queer Ethnographies** Karen Nakamura

Exploration of both classic and contemporary ethnographies of gender and sexuality. Emphasis on understanding anthropology's contribution to and relationship with gay and lesbian studies and queer theory. SO RP  
 Anthropology: Sociocultural

**\* ANTH 310a / E&EB 280a, Mammalogy** Eric Sargis

The evolution and diversity of mammals, including primates. Origins, evolutionary history, systematics, morphology, biogeography, physiology, behavior, and ecology of major mammalian lineages. Accompanying laboratories focus on diagnostic morphological features of mammalian groups through examination of specimens from the Peabody Museum. SC  
 Anthropology: Biological

**\* ANTH 311b, Anthropological Theory** Narges Erami

Key texts in the theoretical development of sociocultural anthropology. Theorists include Emile Durkheim, Marcel Mauss, A. R. Radcliffe-Brown, Bronislaw Malinowski, E. E. Evans-Pritchard, Claude Lévi-Strauss, Mary Douglas, Clifford Geertz, Sherry Ortner, Michele Rosaldo, and Talal Asad. SO  
 Anthropology: Sociocultural

**ANTH 316Lb / ARCG 316Lb, Introduction to Archaeological Laboratory Sciences**  
Staff

Introduction to techniques of archaeological laboratory analysis, with quantitative data styles and statistics appropriate to each. Topics include dating of artifacts, sourcing of ancient materials, remote sensing, and microscopic and biochemical analysis. Specific techniques covered vary from year to year.  
 Anthropology: Archaeology

\* **ANTH 320a / ARCG 320a, Mesopotamian Origins** Harvey Weiss

Analysis of the archaeological and paleoenvironmental data for rain-fed and irrigation agriculture settlement, subsistence, and politicoeconomic innovation in Mesopotamia, from sedentary agriculture villages to cities and states to early empire. Focus on combinations of dynamic social and environmental forces that drove these developments. SO

Anthropology: Archaeology

\* **ANTH 326b / ARCG 326b, Ancient Civilizations of the Eurasian Steppes**

William Honeychurch

Examination of peoples of the steppe zone that stretches from Eastern Europe to Mongolia. Overview of what archaeologists know about Eurasian steppe societies, with emphasis on the Neolithic, Bronze and Iron, and medieval ages. Attention both to material culture and to historical sources. Topics range from the domestication of the horse to Genghis Khan's world empire, including the impact these events had on neighboring civilizations in Europe and Asia. SO

Anthropology: Archaeology

\* **ANTH 333a, Bilingualism in Social Context** J. Joseph Errington

The linguistic phenomenon of bilingualism presented through broad issues in social description inseparably linked to it: growth and change in bilingual communities; bilingual usage, social identity, and allegiance; and interactional significances of bilingual speech repertoire use. SO

Anthropology: Linguistic

\* **ANTH 335b / E&EB 342b, Primate Diversity and Evolution** Eric Sargis

The diversity and evolutionary history of living and extinct primates. Focus on major controversies in primate systematics and evolution, including the origins and relationships of several groups. Consideration of both morphological and molecular studies. Morphological diversity and adaptations explored through museum specimens and fossil casts. Recommended preparation: ANTH 116. SC

Anthropology: Biological

\* **ANTH 342b, Cultures and Markets in Asia** Helen Siu

Historical and contemporary movements of people, goods, and cultural meanings that have defined Asia as a region. Reexamination of state-centered conceptualizations of Asia and of established boundaries in regional studies. The intersections of transregional institutions and local societies and their effects on trading empires, religious traditions, colonial encounters, and cultural fusion. Finance flows that connect East Asia and the Indian Ocean to the Middle East and Africa. The cultures of capital and market in the neoliberal and postsocialist world. SO

Anthropology: Sociocultural

\* **ANTH 346a, Anthropological Approaches to Capitalism** Douglas Rogers

An introduction to the anthropological study of capitalism. Focus on how markets and commodities are embedded in social, cultural, and political contexts. Discussion of the many ways people have embraced, reinterpreted, and resisted capitalism worldwide. Consideration of the implications of this diversity for theories of capitalism as a whole. Enrollment limited to sophomores. SO

Anthropology: Sociocultural

\* **ANTH 362b, Unity and Diversity in Chinese Culture** Helen Siu

An exploration of the Chinese identity as it has been reworked over the centuries. Major works in Chinese anthropology and their intellectual connections with general anthropology and historical studies. Topics include kinship and marriage, marketing systems, rituals and popular religion, ethnicity and state making, and the cultural nexus of power.

Anthropology: Sociocultural

\* **ANTH 366a / AMST 435a, Anthropology of Inequality in America** Chloe Taft

Sociocultural dimensions of social inequality in the contemporary United States. Ways in which the socioeconomic processes that produce inequality are inextricably embedded in worlds of cultural meaning; how those meanings are constructed and embodied in everyday practice. Perspectives from anthropology, sociology, economics, history, and popular media. SO

Anthropology: Sociocultural

\* **ANTH 370a, Anthropology of Information** Staff

Semiotic technologies, with a focus on the digital and computational mediation of meaning. Relations between meaning and information, between interpretation and computation, and between interaction and infrastructure. Readings from media studies, cybernetics, computer science, semiotics, anthropology, and critical theory. SO

Anthropology: Linguistic

\* **ANTH 371b, Modern Indonesia** J. Joseph Errington

Political and cultural dynamics in contemporary Indonesia explored from historical and anthropological perspectives. Major ethnic groups, key historical dynamics, political culture, and interaction between modernization and traditional lifeways. Issues of ethnicity, gender, religion, and economy in situations of rapid social change. SO

Anthropology: Sociocultural

\* **ANTH 382a / EVST 345a / F&ES 384a, Environmental Anthropology**

Carol Carpenter

History of the anthropological study of the environment: nature-culture dichotomy, ecology and social organization, methodological debates, politics of the environment, and knowing the environment. SO

Anthropology: Sociocultural

\* **ANTH 384a / HSAR 386a / RLST 301a, Art and Ritual in Tribal India** Staff

Introduction to aesthetic practices performed in a ritual context by tribal groups in India. Focus on ways in which paintings, sculptures, songs, and dances function as mediums through which the divine is materialized. The influence of patrimonialization and commoditization on the production and meaning of ritual objects and images. HU

Anthropology: Sociocultural

\* **ANTH 385a / ARCG 385a, Archaeological Ceramics** Anne Underhill

Archaeological methods for analyzing and interpreting ceramics, arguably the most common type of object found in ancient sites. Focus on what different aspects of ceramic vessels reveal about the people who made them and used them. SO

Anthropology: Archaeology



\* **ANTH 386a, Humanitarian Interventions: Ethics, Politics, and Health**

Catherine Panter-Brick

Analysis of humanitarian interventions from a variety of social science disciplinary perspectives. Issues related to policy, legal protection, health care, morality, and governance in relation to the moral imperative to save lives in conditions of extreme adversity. Promotion of dialogue between social scientists and humanitarian practitioners. SO

Anthropology: Sociocultural

\* **ANTH 391a / ARCG 391a, Paleoclimate and Human Response** Roderick McIntosh

The recursive interaction of climate change with human perception and manipulation of the landscape. Mechanisms and measures of climate change; three case studies of historical response to change at different scales. Prerequisite: an introductory course in archaeology. SO

Anthropology: Archaeology

\* **ANTH 397a / ARCG 397a, Archaeology of East Asia** Anne Underhill

Introduction to the findings and practice of archaeology in China, Japan, Korea, and southeast Asia. Methods used by archaeologists to interpret social organization, economic organization, and ritual life. Attention to major transformations such as the initial peopling of an area, establishment of farming villages, the development of cities, interregional interactions, and the nature of political authority. SO

Anthropology: Archaeology

\* **ANTH 401b, Meaning and Materiality** Staff

The interaction of meaning and materiality. Relations among significance, selection, sieving, and serendipity explored through classic work in biosemiosis, technocognition, and sociogenesis. Sources from sociocultural and linguistic anthropology, philosophy, and cognitive sciences such as psychology. SO

Anthropology: Linguistic

\* **ANTH 407b / ARCG 407b, Origins of Complex Societies in West Africa**

Roderick McIntosh

The great diversity of complex societies that emerged in prehistoric West Africa. Readings from site reports and primary source articles. SO RP

Anthropology: Archaeology

\* **ANTH 409a / EVST 422a / F&ES 422a, Anthropology of Climate Change, Past and Present** Michael Dove

The history of thinking regarding climate and society. Climate theory from the classical era and the Enlightenment; modern anthropological literature on social and environmental change, climatic vulnerability and control, and climate knowledge and its circulation. SO

Anthropology: Sociocultural

\* **ANTH 413a, Language, Culture, and Ideology** J. Joseph Errington

Review of influential anthropological theories of culture, with reference to theories of language that inspired or informed them. American and European structuralism; cognitivist and interpretivist approaches to cultural description; the work of Bakhtin, Bourdieu, and various critical theorists. SO RP

Anthropology: Linguistic

\* **ANTH 431a / MMES 412a, Anthropology of Handmade Commodities**

Narges Erami

The art of making things, with a focus on the recent popularity of handcrafted goods from around the world. Theories on modernity and technology, movement and action, and aesthetics. The practice of making Persian carpets, including their history, color and design, and relation to Islamic art. HU, SO

Anthropology: Sociocultural

\* **ANTH 437b, Anthropology of the Material World** Anne Underhill

Current research on the material world by sociocultural anthropologists and archaeologists. Interpretations each subfield of anthropology makes about the cultural meanings of objects and the built environment. Issues include beliefs about the value of goods, theoretical approaches to consumption, organizations of production, the roles of objects in rituals, and cultural heritage. Attention to collections in the Division of Anthropology at the Yale Peabody Museum. HU, SO

Anthropology: Sociocultural

Anthropology: Archaeology

\* **ANTH 438b, Culture, Power, Oil** Douglas Rogers

The production, circulation, and consumption of petroleum as they relate to globalization, empire, cultural performance, natural resource extraction, and the nature of the state. Case studies include the United States, Saudi Arabia, Nigeria, Venezuela, and the former Soviet Union. SO

Anthropology: Sociocultural

\* **ANTH 439a, African Politics and Anthropology from the Nineteenth Century to the Present** Staff

Historical-anthropological study of politics in Africa since the early nineteenth century. The creation and operation of African states; the negotiation of legitimacy, authority, and belonging by state agents and the people they govern; anthropological theories about the workings of African politics, including the involvement of both state and nonstate actors. SO

Anthropology: Sociocultural

\* **ANTH 452a, Ethnographic Fieldwork: Analysis and Practice** Kathryn Dudley

Introduction to qualitative research in anthropology, focusing on participant observation, interview, and documentary techniques. Workshop format. SO

Anthropology: Sociocultural

\* **ANTH 454b / ARCG 454b, Statistics for Archaeological Analysis**

William Honeychurch

An introduction to quantitative data collection, analysis, and argumentation for archaeologists. Emphasis on the exploration, visualization, and analysis of specifically archaeological data using simple statistical approaches. No prior knowledge of statistics required.

Anthropology: Archaeology

\* **ANTH 456a / ARCG 456a, Reconstructing Human Evolution: An Ecological Approach** Andrew Hill

Methods for obtaining data relevant to ecological factors that have affected human evolutionary change, such as changes in climate, competition with other animals, and availability and kinds of food supply. Evaluation of techniques for obtaining

ecological data in such fields as geology, paleobotany, and paleozoology. Ethnographic, primatological, and other biological models of early human behavior. SO  
 Anthropology: Biological

**\* ANTH 457a or b, Topics in Evolutionary Theory** Staff

Classic and current literature in theoretical evolutionary biology. Intensive training in critical analysis of theoretical concepts and in scientific writing. Recommended preparation: ANTH 267 or <270>. SO  
 Anthropology: Biological  
 Anthropology: Sociocultural

**\* ANTH 459b, Ethnopediatrics** Staff

Cross-cultural study of the relation between biology and culture and its influence on children's well-being. Ways in which the health, growth, and development of children are shaped by the interactions of human evolutionary biology, ecology, and local cultural patterns. SO

**ANTH 464b / ARCG 464b, Human Osteology** Eric Sargis

A lecture and laboratory course focusing on the characteristics of the human skeleton and its use in studies of functional morphology, paleodentography, and paleopathology. Laboratories familiarize students with skeletal parts; lectures focus on the nature of bone tissue, its biomechanical modification, sexing, aging, and interpretation of lesions. SO

Anthropology: Biological

**\* ANTH 471a and ANTH 472b, Readings in Anthropology** Staff

For students who wish to investigate an area of anthropology not covered by regular departmental offerings. The project must terminate with at least a term paper or its equivalent. No student may take more than two terms for credit. To apply for admission, a student should present a prospectus and bibliography to the director of undergraduate studies no later than the third week of the term. Written approval from the faculty member who will direct the student's reading and writing must accompany the prospectus.

**\* ANTH 473b / ARCG 473b / EVST 473b, Abrupt Climate Change and Societal Collapse** Harvey Weiss

The coincidence of societal collapses throughout history with decadal and century-scale drought events. Challenges to anthropological and historical paradigms of cultural adaptation and resilience. Examination of archaeological and historical records and high-resolution sets of paleoclimate proxies. HU, SO

Anthropology: Sociocultural

**\* ANTH 474b, Anthropologies of Insurgency** Staff

An anthropological viewpoint applied to insurgency and to the interlinked categories of rebel, bandit, and freedom fighter. Specific instances of illegal use of force in their sociocultural and historic settings subjected to sociological and micropolitical analysis; consideration of insurgency from the actors' points of view. SO

Anthropology: Sociocultural

**\* ANTH 491a or b, The Senior Essay** Staff

Supervised investigation of some topic in depth. The course requirement is a long essay to be submitted as the student's senior essay. By the end of the third week of the term in which the essay is written, the student must present a prospectus and a

preliminary bibliography to the director of undergraduate studies. Written approval from an Anthropology faculty adviser and an indication of a preferred second reader must accompany the prospectus.

## Applied Mathematics

Director of undergraduate studies: Daniel Spielman, 340 17 HLH, 436-1264, daniel.spielman@yale.edu; senior coordinator: Andrew Barron, 24 Hillhouse Ave., 432-0634, andrew.barron@yale.edu; associate director of undergraduate studies: Sekhar Tatikonda, 338 17 HLH, 432-4714, sekhar.tatikonda@yale.edu

### FACULTY ASSOCIATED WITH THE PROGRAM OF APPLIED MATHEMATICS

**Professors** Andrew Barron (*Statistics*), Donald Brown (*Economics, Mathematics*), Joseph Chang (*Statistics*), Ronald Coifman (*Mathematics*), Gustave Davis (*School of Medicine*), Stanley Eisenstat (*Computer Science*), Michael Fischer (*Computer Science*), Igor Frenkel (*Mathematics*), Roger Howe (*Mathematics*), Peter Jones (*Mathematics*), A. Stephen Morse (*Electrical Engineering*), David Pollard (*Statistics*), Nicholas Read (*Physics, Applied Physics*), Vladimir Rokhlin (*Computer Science, Mathematics*), Herbert Scarf (*Economics*), Peter Schultheiss (*Emeritus*) (*Electrical Engineering*), Martin Schultz (*Emeritus*) (*Computer Science*), Mitchell Smooke (*Mechanical Engineering, Applied Physics*), Daniel Spielman (*Computer Science*), Van Vu (*Mathematics*), Günter Wagner (*Ecology & Evolutionary Biology*), Xiao-Jing Wang (*Neurobiology*), John Wettlaufer (*Geology & Geophysics, Physics*), Huibin Zhou (*Statistics*), Steven Zucker (*Computer Science, Biomedical Engineering*)

**Associate Professors** John Emerson (*Statistics*), Thierry Emonet (*Molecular, Cellular, & Developmental Biology, Physics*), Josephine Hoh (*Epidemiology & Public Health*), Yuval Kluger (*Pathology*), Michael Krauthammer (*Pathology*), Sekhar Tatikonda (*Electrical Engineering, Statistics*)

**J. W. Gibbs Assistant Professors** Yael Algom Kfir (*Mathematics*), Kim Dang, Roy Lederman, Andrei Osipov (*Mathematics*)

Mathematical models are widely used throughout science and engineering in fields as diverse as physics, bioinformatics, robotics, image processing, and economics. Despite the broad range of applications, there are a few essential techniques used in addressing most problems. The Applied Mathematics major provides a foundation in these mathematical techniques and trains the student to use them in a substantive field of application.

The interdisciplinary major permits a great deal of flexibility in design. It is intended to appeal to students who wish to study the more mathematical aspects of science or engineering as well as those whose primary interest is in mathematics and statistics and who wish to become acquainted with applications. Core courses are drawn from Computer Science (p. 210), Mathematics (p. 490), Statistics (p. 656), and Engineering and Applied Science (p. 273). Courses applying mathematics may be drawn from participating programs in Applied Physics (p. 134); Astronomy (p. 161); the biological sciences, including Ecology and Evolutionary Biology (p. 239), Molecular Biophysics and Biochemistry (p. 514), and Molecular, Cellular, and Developmental Biology (p. 521); Chemistry (p. 179); Computer

Science (p. 210); Economics (p. 247); the various programs in engineering, including Biomedical (p. 168), Chemical (p. 174), Electrical (p. 262), Environmental (p. 298), and Mechanical (p. 501) Engineering; Geology and Geophysics (p. 363); Mathematics; (p. 490) Physics (p. 565); Political Science; (p. 575) and Statistics (p. 656). The Applied Mathematics degree program requires a three-course concentration in a field in which mathematics is used.

Students may pursue a major in Applied Mathematics as one of two majors and can thereby equip themselves with mathematical modeling skills while being fully engaged in a field of application. In this case, the concentration requirement of the Applied Mathematics program is flexible in order to recognize the contribution of the other major. A two-course overlap is permitted in satisfying the requirements of the two majors.

**Prerequisite and introductory courses** Multivariable calculus and linear algebra are required and should be taken before or during the sophomore year. This requirement may be satisfied by MATH 120 and MATH 222 or 225, or equivalents. It may also be satisfied by MATH 230, 231. Computer programming skills are also required and may be acquired by taking ENAS 130 or CPSC 112.

Details of individual programs must be worked out in consultation with the director of undergraduate studies, whose signed permission is required.

**Requirements of the major for the B.A. degree program** The program requires eleven term courses beyond the prerequisites, including the senior project, comprising a coherent program:

1. A course in differential equations (ENAS 194 or MATH 246)
2. A course in probability (STAT 241 or 238)
3. A course in data analysis (STAT 361 or 230)
4. A course in discrete mathematics (AMTH 244 or CPSC 202)
5. Courses in at least three of the following areas: (a) optimization: AMTH 235, 237; (b) probability and statistics: STAT 242, 251, 312, 364, ECON 136, ENAS 496; (c) partial differential equations and analysis: MATH 247, 250, 260, 300, 301, 310; (d) algorithms and numerical methods: CPSC 365, 440, ENAS 440, 441; (e) graph theory: AMTH 462; (f) mathematical economics: ECON 350, 351; (g) electrical engineering: EENG 397, 436, 442, STAT 364; (h) data mining and machine learning: STAT 365, CPSC 445; (i) biological modeling and computation: AMTH 465, CPSC 475, BENG 445, ENAS 391; (j) physical sciences and engineering: MENG 280, 285, 361, 383, 463, 469, CENG 301, 315, ASTR 320, 420, G&G 322, 323, 421, PHYS 343, 401, 402, 410, 420, 430, 440, 442, 460, APHY 439, 448.
6. At least three courses in a field of concentration involving the application of mathematics to that field, at least two of which are advanced courses. Programs in science, engineering, computer science, statistics, and economics are natural sources of concentration. Alternatively, when two majors are undertaken, if the second major is in a participating program, then, recognizing that there can be an overlap of two courses, the student may take for the remaining course an additional choice relevant to the Applied Mathematics major such as listed in point 5 above or for the B.S. degree below. Details of a student's program to satisfy the concentration

requirement must be worked out in consultation with, and approved by, the director of undergraduate studies

7. Senior seminar (AMTH 490) or special project completed during senior year (AMTH 491)

**The B.S. degree program** In addition to the courses indicated for the B.A. degree, the B.S. degree, which totals fourteen term courses beyond the prerequisites, must also include:

1. Topics in analysis (MATH 300) or introduction to analysis (MATH 301); the course selected may not be counted toward the area requirement for the major (see item 5 above)
2. An additional course selected from the list in item 5 above
3. Another course numbered 300 or higher from the list above, or a course numbered 300 or higher in mathematics, applied mathematics, statistics, or quantitative computer science or engineering, subject to the approval of the director of undergraduate studies

Alternatively, students may petition to receive a B.S. in Applied Mathematics by fulfilling the B.A. requirements in Applied Mathematics and the B.S. requirements in another program.

**Credit/D/Fail** A maximum of one course credit taken Credit/D/Fail may be counted toward the requirements of the major.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** MATH 120 and MATH 222 or 225, or equivalents; ENAS 130 or CPSC 112

**Number of courses** *B.A.* — 11 term courses beyond prereqs (incl senior req); *B.S.* — 14 term courses beyond prereqs (incl senior req)

**Specific courses required** *B.A.* — ENAS 194 or MATH 246; STAT 241 or 238; STAT 361 or 230; AMTH 244 or CPSC 202; *B.S.* — same, plus MATH 300 or 301

**Distribution of courses** *B.A.* — at least 3 courses in a field of concentration concerning the application of math to that field, at least 2 of them advanced; 3 addtl courses as specified; *B.S.* — same, with 2 addtl courses as specified

**Substitution permitted** MATH 230, 231 for mathematics prerequisites

**Senior requirement** Senior sem (AMTH 490) or special project (AMTH 491)

## Introductory Courses

**AMTH 160b, The Structure of Networks** Ronald Coifman

Network structures and network dynamics described through examples and applications ranging from marketing to epidemics and the world climate. Study of social and biological networks as well as networks in the humanities. Mathematical graphs provide a simple common language to describe the variety of networks and their properties. QR

**AMTH 222a or b / MATH 222a or b, Linear Algebra with Applications** Staff

Matrix representation of linear equations. Gauss elimination. Vector spaces. Linear independence, basis, and dimension. Orthogonality, projection, least squares approximation; orthogonalization and orthogonal bases. Extension to function spaces.

Determinants. Eigenvalues and eigenvectors. Diagonalization. Difference equations and matrix differential equations. Symmetric and Hermitian matrices. Orthogonal and unitary transformations; similarity transformations. After MATH 115 or equivalent. May not be taken after MATH 225. QR

## Intermediate and Advanced Courses

### **AMTH 244a / MATH 244a, Discrete Mathematics** Nathan Kaplan

Basic concepts and results in discrete mathematics: graphs, trees, connectivity, Ramsey theorem, enumeration, binomial coefficients, Stirling numbers. Properties of finite set systems. Recommended preparation: MATH 115 or equivalent. QR

### **AMTH 247b / G&G 247b / MATH 247b, Partial Differential Equations** Igor Frenkel

Introduction to partial differential equations, wave equation, Laplace's equation, heat equation, method of characteristics, calculus of variations, series and transform methods, and numerical methods. Prerequisites: MATH 222 or 225, MATH 246, and ENAS 194, or equivalents. QR

### **AMTH 260a / MATH 260a, Basic Analysis in Function Spaces** Kim Dang

Diagonalization of linear operators, with applications in physics and engineering; calculus of variations; data analysis. MATH 260 is a natural continuation of PHYS 301. Prerequisites: MATH 120, and 222 or 225. QR

### **\* AMTH 342a / EENG 442a, Linear Systems** A. Stephen Morse

Introduction to finite-dimensional, continuous, and discrete-time linear dynamical systems. Exploration of the basic properties and mathematical structure of the linear systems used for modeling dynamical processes in robotics, signal and image processing, economics, statistics, environmental and biomedical engineering, and control theory. Prerequisite: MATH 222 or permission of instructor. QR

### **AMTH 361a / STAT 361a, Data Analysis** Khandoker Bakar

Selected topics in statistics explored through analysis of data sets using the R statistical computing language. Topics include linear and nonlinear models, maximum likelihood, resampling methods, curve estimation, model selection, classification, and clustering. Weekly sessions in the Statistical Computing laboratory. After STAT 242 and MATH 222 or 225, or equivalents. QR

### **AMTH 364b / EENG 454b / STAT 364b, Information Theory** Andrew Barron

Foundations of information theory in communications, statistical inference, statistical mechanics, probability, and algorithmic complexity. Quantities of information and their properties: entropy, conditional entropy, divergence, redundancy, mutual information, channel capacity. Basic theorems of data compression, data summarization, and channel coding. Applications in statistics and finance. After STAT 241. QR

### **AMTH 428a / E&EB 428a / G&G 428a / PHYS 428a, Science of Complex Systems**

Jun Korenaga

Introduction to the quantitative analysis of systems with many degrees of freedom. Fundamental components in the science of complex systems, including how to simulate complex systems, how to analyze model behaviors, and how to validate models using observations. Topics include cellular automata, bifurcation theory, deterministic chaos, self-organized criticality, renormalization, and inverse theory. Prerequisite: PHYS 301, MATH 247, or equivalent. QR, SC

\* **AMTH 480a or b, Directed Reading** Daniel Spielman

Individual study for qualified students who wish to investigate an area of applied mathematics not covered in regular courses. A student must be sponsored by a faculty member who sets the requirements and meets regularly with the student. Requires a written plan of study approved by the faculty adviser and the director of undergraduate studies.

\* **AMTH 490b, Senior Seminar and Project** Andrew Barron

Under the supervision of a member of the faculty, each student works on an independent project. Students participate in seminar meetings at which they speak on the progress of their projects. Some meetings may be devoted to talks by visiting faculty members or applied mathematicians.

\* **AMTH 491a or b, Special Projects** Daniel Spielman

Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. The student must submit a written report about the results of the project. May be taken more than once for credit.

## Applied Physics

Director of undergraduate studies: Daniel Prober, 417 BCT, 432-4280,  
daniel.prober@yale.edu; appliedphysics.yale.edu

### FACULTY OF THE DEPARTMENT OF APPLIED PHYSICS

**Professors** Charles Ahn, † Sean Barrett, Hui Cao, Richard Chang (*Emeritus*), Michel Devoret, Paul Fleury, † Steven Girvin, † Leonid Glazman, Victor Henrich, † Marshall Long, † Tso-Ping Ma, Simon Mochrie, Daniel Prober, Nicholas Read, † Mark Reed, Robert Schoelkopf, † Ramamurti Shankar, † Mitchell Smooke, A. Douglas Stone, † John Tully, Robert Wheeler (*Emeritus*), Werner Wolf (*Emeritus*)

**Associate Professors** † Eric Dufresne, † Jack Harris, Sohrab Ismail-Beigi, † Corey O'Hern, † Hongxing Tang

**Assistant Professors** Liang Jiang, Peter Rakich

† A joint appointment with primary affiliation in another department.

Physics is the study of the fundamental laws of nature. Applied physics uses these laws to understand phenomena that have practical applications. Engineering in turn makes use of these phenomena for human purposes. Applied physics thus forms a link between the fundamental laws of nature and their applications. Students majoring in Applied Physics take courses in both physics and engineering, as well as courses specifically in applied physics. Students completing the program in Applied Physics are prepared for graduate study in applied physics, in physics, in nanoscience, or in engineering, and, with appropriate prerequisites, in medicine; or they may choose careers in a wide range of technical and commercial fields or in fields such as technical writing or patent law that draw on interdisciplinary subjects.

Contemporary physical science and engineering are becoming increasingly interdisciplinary. Traditional boundaries between fields have blurred, and new areas are constantly emerging, e.g., nanotechnology. The Applied Physics major provides



a flexible framework on which students can build a curriculum tailored to their own interests, in consultation with the director of undergraduate studies.

**Introductory courses** During the freshman year, students interested in Applied Physics should start by taking courses in mathematics, and physics if possible, appropriate to their level of preparation. The choice between different starting points is generally made on the basis of performance on Advanced Placement tests; see the Freshman Web site (<http://yalecollege.yale.edu/content/academic-information>) for more information.

The recommended sequence in mathematics for students interested in Applied Physics or Electrical or Mechanical Engineering is MATH 115, APHY 151, MATH 222, and APHY 194. Either MATH 120 or MATH 230, 231 is an acceptable alternative to APHY 151, and MATH 225 is an acceptable alternative to MATH 222. Similarly, PHYS 301 may be substituted for APHY 194 and MATH 222.

The recommended starting courses in physics are PHYS 200 and 201. These courses should be taken in the freshman year by students who have a strong preparation in mathematics and physics. Students with a particularly strong background in physics and mathematics may take PHYS 260 and 261 instead. Students who are less well prepared in physics and mathematics may choose to take PHYS 180 and 181 during their freshman year, or PHYS 200 and 201 during their sophomore year after they have taken more mathematics courses. Two laboratory courses, such as PHYS 205L and 206L, should be taken at some time during the freshman or sophomore year.

Because computers are ubiquitous in the practical applications of physics, students interested in Applied Physics should also take a course on the use of computers early in their studies. ENAS 130 is recommended; a comparable course in computer science may be substituted with the approval of the director of undergraduate studies.

The multiplicity of choices facing students interested in this general area indicates the importance of informed advice for freshmen. Students should consult freely with directors of undergraduate studies and individual faculty members in their departments of interest to optimize choices and to ensure maximum flexibility at the time a major is selected.

The major in Applied Physics requires eight courses beyond the introductory sequence. Two of these must be APHY 471, 472. All majors are also required to take APHY 322, 439, and PHYS 420, or equivalents. The three remaining advanced courses should focus on a particular area of concentration. For example, a student interested in solid-state and/or quantum electronics might choose from APHY 321, 448, 449, EENG 320, and 325. A student interested in the physics of materials and/or nanoscience might choose from APHY 448, 449, CHEM 220, 450, and MENG 285. Many other concentrations are possible.

**Senior requirement** Seniors must complete an independent research project, taken as APHY 471 and 472. The independent research project is under the supervision of a faculty member in Applied Physics, engineering (p. 272), or the departments of Physics (p. 565), Computer Science (p. 210), or Geology and Geophysics (p. 363). The project may be started in the junior year and continued into the senior year. Students planning to do a research project should contact the project coordinator as early as possible to discuss available options and general requirements.

A well-prepared student interested in materials physics or quantum electronics who starts the senior research in the junior year might elect the following course sequence:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
APHY 151	APHY 194	APHY 439	APHY 448
MATH 222	APHY 322	APHY 472	APHY 449
PHYS 200	ENAS 130	EENG 320	APHY 471
PHYS 201	PHYS 206L	PHYS 420	
PHYS 205L			

A student interested in alternative energy who starts physics in the sophomore year and conducts research in the senior year might elect:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
MATH 115	APHY 194	APHY 322	APHY 448
MATH 120	MATH 222	APHY 439	APHY 471
	PHYS 200	EENG 320	APHY 472
	PHYS 201	ENAS 130	EENG 406
	PHYS 205L	PHYS 420	
	PHYS 206L		

**Approval of programs** The Applied Physics major provides for various programs corresponding to a range of student interests. Substitutions of equivalent courses may be permitted. Students interested in an Applied Physics major should contact the director of undergraduate studies as early as possible, and in any case by the end of the sophomore year.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** PHYS 180, 181, or 200, 201, with appropriate math coreqs and 2 lab courses as specified; APHY 151 or MATH 120; MATH 222 and APHY 194, or PHYS 301; ENAS 130

**Number of courses** 8 term courses beyond prereqs (incl senior req)

**Distribution of courses** 3 courses in physical or mathematical sciences or engineering in area of concentration, with DUS approval

**Specific courses required** APHY 322, 439, PHYS 420, or equivalents

**Substitution permitted** Any relevant course approved by DUS

**Senior requirement** APHY 471 and 472

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## Courses

\* **APHY 050b / PHYS 050b, Science of Modern Technology** Daniel Prober  
Examination of the science behind selected advances in modern technology. Focus on the scientific and contextual basis of each advance. Topics are developed by the participants with the instructor and with guest lecturers, and may include nanotechnology, quantum computation and cryptography, optical systems for communication and medical diagnostics, transistors, satellite imaging and global positioning systems, large-scale immunization, and DNA made to order. Enrollment

limited to freshmen. Preregistration required; see under Freshman Seminar Program.

SC RP

**\* APHY 100a / ENAS 100a / EVST 100a / G&G 105a / PHYS 100a, Energy Technology and Society** Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non-science majors with strong backgrounds in math and science. Enrollment limited to 24. For application instructions, visit the course site on Classes\*v2 (<http://classesv2.yale.edu>). QR, SC

**\* APHY 110b / ENAS 110b, The Technological World** Victor Henrich

An exploration of modern technologies that play a role in everyday life, including the underlying science, current applications, and future prospects. Examples include solar cells, light-emitting diodes (LEDs), computer displays, the global positioning system, fiber-optic communication systems, and the application of technological advances to medicine. For students not committed to a major in science or engineering; no college-level science or mathematics required. Prerequisite: high school physics or chemistry. Enrollment limited to 90. For application instructions, visit the course site on Classes\*v2 (<http://classesv2.yale.edu>). QR, SC

**APHY 151a or b / ENAS 151a or b, Multivariable Calculus for Engineers** Staff

An introduction to multivariable calculus focusing on applications to engineering problems. Topics include vector-valued functions, vector analysis, partial differentiation, multiple integrals, vector calculus, and the theorems of Green, Stokes, and Gauss. Prerequisite: MATH 115 or equivalent. QR RP

**APHY 194a or b / ENAS 194a or b, Ordinary and Partial Differential Equations with Applications** Staff

Basic theory of ordinary and partial differential equations useful in applications. First- and second-order equations, separation of variables, power series solutions, Fourier series, Laplace transforms. Prerequisites: ENAS 151 or equivalent, and knowledge of matrix-based operations. QR RP

**APHY 321b / EENG 401b, Semiconductor Silicon Devices and Technology**

Tso-Ping Ma

Introduction to integrated circuit technology, theory of semiconductor devices, and principles of device design and fabrication. Laboratory involves the fabrication and analysis of semiconductor devices, including Ohmic contacts, Schottky diodes, p-n junctions, solar cells, MOS capacitors, MOSFETs, and integrated circuits. Prerequisite: EENG 320 or equivalent or permission of instructor. QR, SC

**APHY 322b, Electromagnetic Waves and Devices** Peter Rakich

Introduction to electrostatics and magnetostatics, time varying fields, and Maxwell's equations. Applications include electromagnetic wave propagation in lossless, lossy, and metallic media and propagation through coaxial transmission lines and rectangular waveguides, as well as radiation from single and array antennas. Occasional experiments and demonstrations are offered after classes. Prerequisites: PHYS 180, 181, or 200, 201. QR, SC

**APHY 439a / PHYS 439, Basic Quantum Mechanics** Robert Schoelkopf

The basic concepts and techniques of quantum mechanics essential for solid-state physics and quantum electronics. Topics include the Schrödinger treatment of the

harmonic oscillator, atoms and molecules and tunneling, matrix methods, and perturbation theory. Prerequisites: PHYS 181 or 201, PHYS 301, or equivalents, or permission of instructor. QR, SC

**APHY 448a / PHYS 448a, Solid-State Physics I** Victor Henrich

The first term of a two-term sequence covering the principles underlying the electrical, thermal, magnetic, and optical properties of solids, including crystal structure, phonons, energy bands, semiconductors, Fermi surfaces, magnetic resonances, phase transitions, dielectrics, magnetic materials, and superconductors. Prerequisites: APHY 322, 439, PHYS 420. QR, SC

**APHY 449b / PHYS 449b, Solid-State Physics II** Michel Devoret

The second term of the sequence described under APHY 448. QR, SC

**APHY 458a / PHYS 458a, Principles of Optics with Applications** Hui Cao

Introduction to the principles of optics and electromagnetic wave phenomena with applications to microscopy, optical fibers, laser spectroscopy, and nanostructure physics. Topics include propagation of light, reflection and refraction, guiding light, polarization, interference, diffraction, scattering, Fourier optics, and optical coherence. Prerequisite: PHYS 430. QR, SC

**\* APHY 471a and APHY 472b, Special Projects** Staff

Faculty-supervised individual or small-group projects with emphasis on research (laboratory or theory). Students are expected to consult the director of undergraduate studies and appropriate faculty members to discuss ideas and suggestions for suitable topics. These courses may be taken at any appropriate time in the student's career; they may be taken more than once. Permission of the faculty adviser and of the director of undergraduate studies is required.

## Archaeological Studies

Director of undergraduate studies: Oswaldo Chinchilla, Rm. 301, 51 Hillhouse Ave., 436-5923, [oswaldo.chinchilla@yale.edu](mailto:oswaldo.chinchilla@yale.edu); [www.yale.edu/archaeology](http://www.yale.edu/archaeology)

### COUNCIL ON ARCHAEOLOGICAL STUDIES

**Anthropology** Richard Burger (*Chair*), Oswaldo Chinchilla, Andrew Hill, William Honeychurch, Roderick McIntosh, Eric Sargis, Anne Underhill

**Classics** Milette Gaifman, Andrew Johnston, Diana Kleiner

**Geology & Geophysics** Ronald Smith

**History** Valerie Hansen

**History of Art** Edward Cooke, Jr., Mary Miller

**Near Eastern Languages & Civilizations** John Darnell, Stephen Davis, Karen Foster, Eckart Frahm, Colleen Manassa, Harvey Weiss

This special interdisciplinary major is supervised by the University's Council on Archaeological Studies. Inquiries about the major may be addressed to the chair of the council, Richard Burger, Department of Anthropology, 10 Schem Street, or to the director of undergraduate studies.

The major in Archaeological Studies provides a program of interdepartmental offerings covering prehistoric, early historic, and medieval cultures and cultural developments in the Old and New Worlds, and introduces students to the analytic tools that facilitate archaeological studies. The major is designed to expose students to a variety of archaeological research perspectives: anthropological, historical, art historical, and physical science. Also emphasized are substantive studies including (1) study of such prehistoric–early historic transformations as the origins of agriculture, cities and states, and early empires, and (2) study of the material culture, art, and architecture of prehistoric, early historic, and medieval cultures, including the iconography of ancient cultures, the relationship between art and society, ancient writing systems, and American historical archaeology.

**Requirements of the major** The major consists of thirteen courses including the senior project. The following six courses are required: an introductory survey; a summer course in field techniques or a Yale-affiliated summer research project, approved in advance by the Council; the introductory laboratory course ARCG 316L; an advanced laboratory course; a theory course; and the senior research project ARCG 491. The remaining seven courses required for the major must be distributed among the six subject areas represented by the departments and programs offering courses multiple-titled with Archaeological Studies, with three of those seven courses falling in different departments and programs. The relevant departments and programs are Anthropology, Classics, Environmental Studies, Geology and Geophysics, History of Art, and Near Eastern Languages and Civilizations. Some courses may be applied to categories other than the ones in which they are listed in this bulletin, upon application to the director of undergraduate studies. For three of the seven archaeology electives students may, with permission of the director of undergraduate studies, substitute three courses from other departments in areas related to their research.

Students majoring in Archaeological Studies are strongly encouraged, but not required, to devote a second summer either to archaeological research in the field or laboratory or to an additional field course in archaeology. Members of the Council faculty currently direct archaeological field projects in China, Egypt, Guatemala, Peru, Mali, Mongolia, Senegal, Syria, and Rome. Qualified majors are encouraged to apply for research positions with these projects.

**Senior requirement** The final requirement for the major is a senior research project (ARCG 491) in some field of archaeology, preferably one involving more than one area or discipline.

Students majoring in Archaeological Studies should consult with the director of undergraduate studies at the beginning of each term.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 13 term courses (incl senior project)

**Specific course required** ARCG 316L

**Distribution of courses** 1 intro survey; 1 summer field techniques course or research project, as specified; 1 advanced lab; 1 theory course; 7 electives, at least 1 in each of 3 areas, as specified

**Substitution permitted** For 3 electives, 3 courses related to research, with DUS permission

**Senior requirement** Research project (ARCG 491)

## Anthropology

\* **ARCG 030b / ANTH 030b / LAST 030b, Inca Culture and Society** Richard Burger  
History of the Inca empire of the Central Andes, including the empire's impact on the nations and cultures it conquered. Overview of Inca religion, economy, political organization, technology, and society. Ways in which different schools of research have approached and interpreted the Incas over the last century, including the influence of nationalism and other sources of bias on contemporary scholarship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO

**ARCG 171b / ANTH 171b, Great Civilizations of the Ancient World** Anne Underhill  
A survey of selected prehistoric and historical cultures through examination of archaeological sites and materials. Emphasis on the methodological and theoretical approaches by which archaeologists recover, analyze, and interpret the material remains of the past. SO

**ARCG 172a / ANTH 172a, Great Hoaxes and Fantasies in Archaeology**

William Honeychurch

Examination of selected archaeological hoaxes, cult theories, and fantasies; demonstration of how archaeology can be manipulated to authenticate nationalistic ideologies, religious causes, and modern stereotypes. Examples of hoaxes and fantasies include the lost continent of Atlantis, Piltdown man, ancient giants roaming the earth, and alien encounters. Evaluation of how, as a social science, archaeology is capable of rejecting such interpretations about the past. SO

**ARCG 232b / ANTH 232b / LAST 232b, Ancient Civilizations of the Andes**

Richard Burger

Survey of the archaeological cultures of Peru and Bolivia from the earliest settlement through the late Inca state. SO

**ARCG 267b / ANTH 267b, Human Evolution** Andrew Hill

Examination of the fossil record of human evolution, including both paleontological and archaeological evidence for changes in hominid behavior during the Pleistocene. Prerequisite: an introductory course in biological anthropology or biology. SO

**ARCG 316Lb / ANTH 316Lb, Introduction to Archaeological Laboratory Sciences**

Staff

Introduction to techniques of archaeological laboratory analysis, with quantitative data styles and statistics appropriate to each. Topics include dating of artifacts, sourcing of ancient materials, remote sensing, and microscopic and biochemical analysis. Specific techniques covered vary from year to year.

\* **ARCG 320a / ANTH 320a, Mesopotamian Origins** Harvey Weiss

Analysis of the archaeological and paleoenvironmental data for rain-fed and irrigation agriculture settlement, subsistence, and politicoeconomic innovation in Mesopotamia, from sedentary agriculture villages to cities and states to early empire.

Focus on combinations of dynamic social and environmental forces that drove these developments. SO

\* **ARCG 326b / ANTH 326b, Ancient Civilizations of the Eurasian Steppes**

William Honeychurch

Examination of peoples of the steppe zone that stretches from Eastern Europe to Mongolia. Overview of what archaeologists know about Eurasian steppe societies, with emphasis on the Neolithic, Bronze and Iron, and medieval ages. Attention both to material culture and to historical sources. Topics range from the domestication of the horse to Genghis Khan's world empire, including the impact these events had on neighboring civilizations in Europe and Asia. SO

\* **ARCG 385a / ANTH 385a, Archaeological Ceramics** Anne Underhill

Archaeological methods for analyzing and interpreting ceramics, arguably the most common type of object found in ancient sites. Focus on what different aspects of ceramic vessels reveal about the people who made them and used them. SO

\* **ARCG 391a / ANTH 391a, Paleoclimate and Human Response** Roderick McIntosh

The recursive interaction of climate change with human perception and manipulation of the landscape. Mechanisms and measures of climate change; three case studies of historical response to change at different scales. Prerequisite: an introductory course in archaeology. SO

\* **ARCG 397a / ANTH 397a, Archaeology of East Asia** Anne Underhill

Introduction to the findings and practice of archaeology in China, Japan, Korea, and southeast Asia. Methods used by archaeologists to interpret social organization, economic organization, and ritual life. Attention to major transformations such as the initial peopling of an area, establishment of farming villages, the development of cities, interregional interactions, and the nature of political authority. SO

\* **ARCG 407b / ANTH 407b, Origins of Complex Societies in West Africa**

Roderick McIntosh

The great diversity of complex societies that emerged in prehistoric West Africa. Readings from site reports and primary source articles. SO RP

\* **ARCG 454b / ANTH 454b, Statistics for Archaeological Analysis**

William Honeychurch

An introduction to quantitative data collection, analysis, and argumentation for archaeologists. Emphasis on the exploration, visualization, and analysis of specifically archaeological data using simple statistical approaches. No prior knowledge of statistics required.

\* **ARCG 456a / ANTH 456a, Reconstructing Human Evolution: An Ecological Approach** Andrew Hill

Methods for obtaining data relevant to ecological factors that have affected human evolutionary change, such as changes in climate, competition with other animals, and availability and kinds of food supply. Evaluation of techniques for obtaining ecological data in such fields as geology, paleobotany, and paleozoology. Ethnographic, primatological, and other biological models of early human behavior. SO

**ARCG 464b / ANTH 464b, Human Osteology** Eric Sargis

A lecture and laboratory course focusing on the characteristics of the human skeleton and its use in studies of functional morphology, paleodemography, and paleopathology.

Laboratories familiarize students with skeletal parts; lectures focus on the nature of bone tissue, its biomechanical modification, sexing, aging, and interpretation of lesions.  
SO

## Classics

### **ARCG 170a / CLCV 170a / HSAR 250a, Roman Art: Empire, Identity, and Society**

Diana Kleiner

Masterpieces of Roman art from the Republic to Constantine studied in their historical and social contexts. The great Romans and the monuments they commissioned—portraits, triumphal arches, columns, and historical reliefs. The concept of empire and imperial identity, politics and portraiture, the making and unmaking of history through art, and the art of women, children, freedmen, and slaves. HU

### **ARCG 252b / CLCV 175b / HSAR 252b, Roman Architecture** Diana Kleiner

The great buildings and engineering marvels of Rome and its empire. Study of city planning and individual monuments and their decoration, including mural painting. Emphasis on developments in Rome, Pompeii, and central Italy; survey of architecture in the provinces. HU

### **\* ARCG 424b / HSAR 424b, eClavdia: Women in Ancient Rome** Diana Kleiner

The contributions of Roman women to one of the greatest cities—and one of the greatest empires—in world history. Lost stories of real-life Roman women recovered from public and residential buildings, portraits, paintings, and other works of Roman art and architecture. HU RP

## Environmental Studies

### **\* ARCG 473b / ANTH 473b / EVST 473b, Abrupt Climate Change and Societal Collapse** Harvey Weiss

The coincidence of societal collapses throughout history with decadal and century-scale drought events. Challenges to anthropological and historical paradigms of cultural adaptation and resilience. Examination of archaeological and historical records and high-resolution sets of paleoclimate proxies. HU, SO

## Geology and Geophysics

### **\* ARCG 362b / EVST 362b / G&G 362b, Observing Earth from Space** Xuhui Lee

A practical introduction to satellite image analysis of Earth's surface. Topics include the spectrum of electromagnetic radiation, satellite-borne radiometers, data transmission and storage, computer image analysis, the merging of satellite imagery with GIS and applications to weather and climate, oceanography, surficial geology, ecology and epidemiology, forestry, agriculture, archaeology, and watershed management. Prerequisites: college-level physics or chemistry, two courses in geology and natural science of the environment or equivalents, and computer literacy. QR, SC

## History of Art

### **ARCG 110b / HSAR 110b, Introduction to the History of Art: Global Decorative Arts**

Edward Cooke

Global history of the decorative arts from antiquity to the present. The materials and techniques of ceramics, textiles, metals, furniture, and glass. Consideration of forms,



imagery, decoration, and workmanship. Themes linking geography and time, such as trade and exchange, simulation, identity, and symbolic value. HU

**ARCG 202a / HSAR 202a, Pre-Columbian Architecture** Mary Miller

A survey of pre-Columbian architecture and city planning from the Andes to the southwestern United States. Principal sites considered include Machu Picchu, Cuzco, Tiwanaku, Chichen Itza, Tikal, Monte Alban, Teotihuacan, Mesa Verde, and Pueblo Bonito. Attention to domestic architecture, construction techniques, and archaeoastronomy. HU

**ARCG 236a / HSAR 236a / NELC 103a, The Art of Ancient Palaces** Karen Foster

Introduction to the art and architecture of palaces in ancient Egypt, Mesopotamia, and the Bronze Age Aegean. Special attention to palatial workshops (painting, sculpture, pottery, faience, glass, ivory, metal) in cultural context. Emphasis on the iconography of power, including the establishment within palatial complexes of the world's oldest botanical and zoological gardens. HU

**ARCG 239b / HSAR 239b / HUMS 252b / NELC 104b, Art of the Ancient Near East and Aegean** Karen Foster

Introduction to the art and architecture of Mesopotamia, Egypt, and the Aegean, with attention to cultural and historical contexts. HU

## Near Eastern Languages and Civilizations

**\* ARCG 001b / NELC 001b, Egypt and Northeast Africa: A Multidisciplinary Approach** John Darnell

Examination of approximately 10,000 years of Nile Valley cultural history, with an introduction to the historical and archaeological study of Egypt and Nubia. Consideration of the Nile Valley as the meeting place of the cultures and societies of northeast Africa. Various written and visual sources are used, including the collections of the Peabody Museum and the Yale Art Gallery. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

WR, HU

**ARCG 221a / HSAR 234a / NELC 120a, Egyptomania** Colleen Manassa

Conceptual underpinnings of the use of ancient Egyptian motifs in architecture, painting, sculpture, and decorative arts throughout western Europe, the Middle East, and North America from antiquity to the present. HU

**ARCG 222a / NELC 112a / RLST 141a, Egyptian Religion through the Ages**

John Darnell

Diachronic approach to topics in Egyptian religion. Religious architecture, evidence for protodynastic cults, foreigners in Egyptian religious celebrations, music and vocal expression in Egyptian religion, Re and Osiris, the Amarna interlude and the Ramesside solar religion, and the goddess of the eye of the sun. Readings in translation.

HU

**ARCG 223b / NELC 220b / WGSS 226b, Lives in Ancient Egypt** Colleen Manassa

Introduction to the social history of ancient Egypt from 3,100 to 30 B.C.E. Focus on the lives of particular individuals attested in the textual and archaeological record, from pharaohs and queens to artists, soldiers, and farmers. Reading of primary sources in translation; course projects integrate ancient objects in Yale collections. HU

## Advanced Research Courses

### \* ARCG 471a and ARCG 472b, Directed Reading and Research in Archaeology

Oswaldo Chinchilla Mazariegos

Qualified students may pursue special reading or research under the guidance of an instructor. A written statement of the proposed research must be submitted to the director of undergraduate studies for approval.

### \* ARCG 491a or b, Senior Research Project in Archaeology

Oswaldo Chinchilla Mazariegos

Required of all students majoring in Archaeological Studies. Supervised investigation of some archaeological topic in depth. The course requirement is a long essay to be submitted as the student's senior essay. The student should present a prospectus and bibliography to the director of undergraduate studies no later than the third week of the term. Written approval from the faculty member who will direct the reading and writing for the course must accompany the prospectus.

## Architecture

Director of undergraduate studies: Bimal Mendis, 328 RDH, 432-8325,  
bimal.mendis@yale.edu

### MEMBERS OF THE SCHOOL OF ARCHITECTURE TEACHING IN YALE COLLEGE

**Professors** D. Michelle Addington, Turner Brooks (*Adjunct*), Keller Easterling, Alexander Garvin (*Adjunct*), Steven Harris (*Adjunct*), Dolores Hayden, Alan Plattus, Alexander Purves (*Emeritus*)

**Associate Professors** Eeva-Liisa Pelkonen, Emmanuel Petit

**Assistant Professors** Sunil Bald (*Adjunct*), Bimal Mendis (*Adjunct*), Kyoung Sun Moon, W. Todd Reisz (*Visiting*), Elihu Rubin

**Lecturers** Victor Agran, Karla Britton, Ariane Lourie Harrison, Amy Lelyveld, Daniel Sherer

**Critics** Marta Justo Caldeira, Katherine Davies, Andrei Harwell, Adam Hopfner, Joyce Hsiang, Timothy Newton

**Application to the Architecture major** Yale College students must apply to enter the major during the spring term of their sophomore year, after taking ARCH 150, 154, and 249. An application to the major must be submitted to the office of the director of undergraduate studies no later than 4 p.m. on March 30, 2015, in Room 328 RDH (third floor). All applications are reviewed by a faculty committee. Applications must include the following information: name, address, telephone number, courses related to architecture already taken, a statement of purpose, and a writing sample from Yale College. Portfolios representative of course work for ARCH 150, 154, and 249 must also be submitted for review as part of the application process by May 1, 2015. Applicants must stipulate their first, second, and third choices for the three concentrations in the major. The concentrations, described below, are design; history, theory, and criticism; and urban studies. Although qualified students and students who have fulfilled the prerequisites may be admitted into the Architecture major, they will not necessarily

be admitted to their first-choice concentration. Applicants will be notified in writing regarding acceptance to the major by May 29, 2015. The major is usually limited to twenty students in the junior year and twenty students in the senior year, with a maximum of sixteen students in the design concentration for each year. Students have an opportunity to petition the director of undergraduate studies at the end of either the fall or spring term of their junior year if they wish to change concentrations. The director of undergraduate studies will notify students of the result of such a petition. Based on a student's performance in required courses, the director of undergraduate studies may also recommend a change in concentration.

**Introduction to architecture** Introductory courses are ARCH 150, 154, and 249. They are open to all Yale College students except freshmen, and are required for those interested in the Architecture major prior to application. Freshmen may consider courses such as a freshman seminar, ARCH 260, 261, or STCY 176.

**The standard major** The purpose of the undergraduate major is to include the study of architecture within a comprehensive liberal arts education, drawing from the broader academic and professional environment of the Yale School of Architecture. The curriculum includes work in design, in history, theory, and criticism of architecture, and in urban studies, and leads to a bachelor of arts degree with a major in Architecture. As a liberal arts major in Yale College, it is not an accredited professional degree program. For accredited professional degree programs, refer to the requirements of the National Architectural Accrediting Board (<http://www.naab.org>) (NAAB).

The *design concentration* introduces complex processes involved in solving spatial and programmatic problems. Creative work is grounded in the study of history and culture, and in the analysis of social conditions influencing architecture. Teaching formats include lectures, studio workshops, and individual presentations that culminate in a senior project design studio. The *history, theory, and criticism concentration* is intended to establish a broad historical and intellectual framework for the study of architecture. An interdisciplinary approach is encouraged through additional courses taken in various fields of humanities and social sciences. Normally these interdisciplinary courses address subjects closely linked to architectural history, theory, and criticism. Such courses may include archaeology, history of religion, aesthetics, philosophy, or visual culture. Permission of the director of undergraduate studies is required if the courses fall outside the specified course of studies. During their senior year students complete a written senior essay on a topic approved by the faculty. History, theory, and criticism majors are also urged to study a foreign language. The *urban studies concentration* encourages a broad, interdisciplinary investigation of the complex forces that shape the urban physical environment. The sequence of courses culminates in a senior essay that builds on course work, and either develops analysis and planning proposals for a specific site or furthers an individual research agenda.

**Requirements of the major** Students majoring in Architecture are required to take fifteen course credits. Majors are expected to take three prerequisites in their sophomore year and to complete a core of four courses, for five course credits, by the end of their junior year. They must also base their studies in one of three areas of concentration: design; history, theory, and criticism; or urban studies.

The courses for all concentrations include three prerequisites: ARCH 150, 154, and 249. The core of four courses required for all concentrations includes the studio courses

ARCH 250 and 251, to be taken during the junior year after the student is accepted into the major, and the history of architecture surveys ARCH 260 and 261, to be completed by the end of the junior year. The electives are categorized under four broad subject areas: history and theory of architecture, urbanism and landscape, materials and technology, and structures and computation.

For the design concentration, the following additional courses are required:

1. One elective in history and theory of architecture chosen from the following: ARCH 341, 348, 431, or other relevant course in History of Art (p. 421) approved by the director of undergraduate studies
2. One elective in urbanism and landscape chosen from the following: ARCH 340, 344, 345, 347, 348, 351; STCY 176; or other relevant course in American Studies (p. 105), Ethics, Politics, and Economics (p. 310), Environmental Studies (p. 302), or Political Science (p. 575) approved by the director of undergraduate studies
3. One elective in materials and technology chosen from the following: ARCH 162 163, or other relevant course in Environmental Studies (p. 302) approved by the director of undergraduate studies
4. One elective in structures and computation chosen from the following: ARCH 161, an approved calculus or physics course, or other relevant course approved by the director of undergraduate studies. Elementary calculus is strongly recommended as preparation for graduate studies in Architecture
5. The senior requirement: ARCH 450 and 494

For the history, theory, and criticism concentration, the following additional courses are required:

1. Four electives in history and theory of architecture, chosen from the following: ARCH 341, 348, 431, or other relevant courses in History of Art (p. 421) approved by the director of undergraduate studies
2. One elective in urbanism and landscape chosen from the following: ARCH 340, 344, 345, 347, 348, 351; STCY 176; or other relevant course in American Studies (p. 105), Ethics, Politics, and Economics (p. 310), Environmental Studies (p. 302), or Political Science (p. 575) approved by the director of undergraduate studies
3. The senior requirement: ARCH 490 and 491

For the urban studies concentration, the following additional courses are required:

1. Four electives in urbanism and landscape chosen from the following: ARCH 340, 344, 345, 347, 348, 351; STCY 176; or other relevant courses approved by the director of undergraduate studies in American Studies (p. 105), Ethics, Politics, and Economics (p. 310), Environmental Studies (p. 302), or Political Science (p. 575)
2. One elective in history and theory of architecture chosen from the following: ARCH 341, 348, 431, or other relevant course in History of Art (p. 421) approved by the director of undergraduate studies
3. The senior requirement: ARCH 495 and 491

**Digital media orientation** All Architecture students are required to complete orientation sessions in digital media workshop and materials laboratory. Students enrolled in ARCH 249 are required to complete these sessions at the beginning of the spring term of the sophomore year. Access to digital media equipment will not be allowed until the required orientation sessions have been completed. Questions should be addressed to the director of undergraduate studies or the director of digital media, John Eberhart (432-9655, john.eberhart@yale.edu).

**Library orientation** The Architecture program requires all students to complete a ninety-minute introductory library research session. Students enrolled in ARCH 249 must take this session at the beginning of the spring term of the sophomore year. Failure to complete the required orientation will preclude completion of the major. Students may offer no substitutions for this orientation. Students should register with the Haas Family Arts Library Public Services Librarian, Lindsay King (436-8052, lindsay.king@yale.edu). Questions should be addressed to the director of undergraduate studies.

**Shop orientation** The Architecture program requires all majors to complete several woodshop and materials lab orientation sessions. Students enrolled in ARCH 249 must take these sessions during the first weeks of the spring term of the sophomore year. Access to the woodshop and materials lab will not be allowed until the required orientation sessions have been completed. Questions should be addressed to the director of undergraduate studies or to the shop coordinator, Timothy Newton (432-7234, timothy.newton@yale.edu).

**Senior requirement** Seniors in the design track take ARCH 450, the senior studio, and 494, the senior design project. Seniors in the history, theory, and criticism track take ARCH 490, the senior research colloquium, and 491, the senior project. Seniors in the urban studies track take ARCH 495, the senior research colloquium in urban studies, and 491, the senior project. Proposals for senior projects and essays are submitted in the fall term for review and approval by the senior project coordinator, and then distributed to faculty members for review before the faculty members agree to become senior advisers. Senior essays and projects for ARCH 491 are due in the office of the director of undergraduate studies by Friday, April 17, 2015. In the spring term, all seniors must submit a portfolio of their work to the office of the director of undergraduate studies by Friday, May 1, 2015. For all majors, this portfolio must be representative of the student's design work including prerequisites and the senior project. History, theory, and criticism majors and urban studies majors must also include a copy of the senior essay and other appropriate texts.

**Courses in the School of Architecture** Unless otherwise indicated in the course descriptions, all courses in the School of Architecture are open to majors and nonmajors with permission of the instructor and the graduate registrar. They are not open to the Credit/D/Fail option. Students are admitted on the basis of their previous course work and previous performance.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** ARCH 150, 154, 249

**Number of courses** 15 course credits (incl prereqs and senior req)

**Specific courses required** ARCH 250, 251, 260, 261

**Distribution of courses** *Design*—1 elective in history and theory of architecture, 1 elective in urbanism and landscape, 1 elective in materials and technology, 1 elective in structures and computation, all approved by DUS; *History, theory, and criticism*—4 electives in history and theory of architecture, 1 elective in urbanism and landscape, all approved by DUS; *Urban studies*—4 electives in urbanism and landscape, 1 elective in history and theory of architecture, all approved by DUS

**Other** Orientation sessions in digital media, library, and woodshop and materials lab

**Senior requirement** *All concentrations*—portfolio representative of design work, including prerequisites and the senior requirement; *Design*—ARCH 450 and 494; *History, theory, and criticism*—ARCH 490 and 491; *Urban studies*—ARCH 495 and 491

## Courses

### **ARCH 150a, Introduction to Architecture** Alexander Purves

Lectures and readings in the language of architecture. Architectural vocabulary, elements, functions, and ideals. Notebooks and projects required. Not open to freshmen. Required for all Architecture majors. HU

### \* **ARCH 154b, Drawing Architecture** Victor Agran

Introduction to the visual and analytical skills necessary to communicate architectural ideas. Observation and documentation of architectural space on the Yale campus. Drawing exercises introduce the conventions of architectural representation: plan, section, elevation, and isometric drawings, as well as freehand perceptual drawings of architectural space. Not open to freshmen. Required for all Architecture majors.

### \* **ARCH 162b, Materials in Architecture** Timothy Newton

Science and technology of basic building materials studied together with historic and current design applications. Skills and processes required to create, shape, and connect materials experienced through hands-on projects. Technical notebooks, drawings, design and build exercises, and projects required. Enrollment limited to 20.

### \* **ARCH 230b / STCY 176b, Introduction to the Study of the City** Alexander Garvin

An examination of forces shaping American cities and strategies for dealing with them. Topics include housing, commercial development, parks, zoning, urban renewal, landmark preservation, new towns, and suburbs. The course includes games, simulated problems, fieldwork, lectures, and discussion. SO

### \* **ARCH 249b, The Analytic Model** Ariane Harrison

Introduction to the history and practice of architectural analysis. Students produce drawings, models, and diagrams of significant architectural works in order to facilitate a comprehensive understanding of specific architects, buildings, and contexts. Description of a variety of approaches and the reciprocal relationship between analysis and design. Required for all Architecture majors.

### \* **ARCH 250a, Methods and Form in Architecture I** Bimal Mendis

Analysis of architectural design of specific places and structures. Analysis is governed by principles of form in landscape, program, ornament, and space, and includes design methods and techniques. Readings and studio exercises required. Enrollment limited to 25. Open only to Architecture majors. 1½ Course cr

\* **ARCH 251b, Methods and Form in Architecture II** Joyce Hsiang and Joel Sanders  
Continuation of ARCH 250. Analysis of architectural design of specific places and structures. Analysis is governed by principles of form in landscape, program, ornament, and space, and includes design methods and techniques. Readings and studio exercises required. 1½ Course cr

**ARCH 260a, History of Architecture I: Antiquity to the Baroque** Daniel Sherer  
The first half of a two-term sequence in the history of architecture. Architecture and urbanism from ancient Egypt through Greek and Roman classical traditions to the Enlightenment. The formal expression—organizational, structural, and ornamental—and social context of specific buildings and urban areas. Architecture as a form of social expression that builds on its own stylistic development, articulating a response to changes in history and culture. Emphasis on Western architecture, with selections from other parts of the world. HU

\* **ARCH 261b / HSAR 325b, History of Architecture II: The Eighteenth Century to the Millennium** Eva-Liisa Pelkonen  
Modern architecture and urbanism from the eighteenth century to the end of the twentieth. Genesis and meaning of architectural form, applying national, cultural, and international contexts. HU

\* **ARCH 341a / LAST 318a, Globalization Space** Keller Easterling  
Infrastructure space as a primary medium of change in global polity. Networks of trade, energy, communication, transportation, spatial products, finance, management, and labor, as well as new strains of political opportunity that reside within their spatial disposition. Case studies include free zones and automated ports around the world, satellite urbanism in South Asia, high-speed rail in Japan and the Middle East, agripoles in southern Spain, fiber optic submarine cable in East Africa, spatial products of tourism in North Korea, and management platforms of the International Organization for Standardization. HU

**ARCH 345b, Civic Art: Introduction to Urban Design** Alan Plattus  
Introduction to the history, analysis, and design of the urban landscape. Principles, processes, and contemporary theories of urban design; relationships between individual buildings, groups of buildings, and their larger physical and cultural contexts. Case studies from New Haven and other world cities. HU

\* **ARCH 348b, The Benevolent City** William Reisz  
Cities as places of violence, vice, and irrelevance vs. cities as stages where humanity reaches its most elevated heights of self-realization and cultural production. Critical review of writing about cities to identify recurring arguments and value systems. The question of whether cities should be expected to convey benevolence on their inhabitants. WR, HU

\* **ARCH 351a / AMST 381a, Poets' Landscapes** Dolores Hayden  
Introduction to techniques poets have used to ground their work in the landscapes and buildings of American towns and cities including Chicago, New York, and Los Angeles. Attention to poems from a national automotive landscape as well as narrative poems about cities. Writing exercises in different poetic forms; readings from the works of Dickinson, Frost, Bishop, Lowell, Wilbur, Dickey, Pinsky, Cervantes, and Merrill. WR, HU

\* **ARCH 355a / EAST 446a / HSAR 454a, South Korean Urbanism** Staff

Modern and contemporary South Korean urbanism and its relation to discourses of the everyday. Focus on Seoul as a case study, with attention to commercial environments, ephemeral urban events, and local street cultures. Key texts by philosophers, historians, architectural theorists, and art historians analyzed in the context of artistic and architectural responses to Seoul's urbanism in recent decades. HU

**ARCH 431b, Religion and Modern Architecture** Karla Britton

The historical evolution of sacred building in the twentieth and twenty-first centuries. Relations between a building, its cultural environment, and its cult. The influence of religion in contemporary civic life as manifest in the design and construction of prominent religious buildings. Examination of mosques, synagogues, temples, and churches. Perspectives from philosophy, comparative religion, liturgical studies, and architectural theory and practice. WR, HU

\* **ARCH 450a, Senior Studio** Turner Brooks

Advanced problems with emphasis on architectural implications of contemporary cultural issues. The complex relationship among space, materials, and program. Emphasis on the development of representations—drawings and models—that effectively communicate architectural ideas. To be taken before ARCH 494. Enrollment limited to Architecture majors. 1½ Course cr

\* **ARCH 471a or b, Individual Tutorial** Bimal Mendis

Special courses may be established with individual members of the department only. The following conditions apply: (1) a prospectus describing the nature of the studio program and the readings to be covered must be approved by both the instructor and the director of undergraduate studies; (2) regular meetings must take place between student and instructor; (3) midterm and final reviews are required.

\* **ARCH 472La or b, Individual Tutorial Laboratory** Bimal Mendis

An independent tutorial focusing on methods and techniques of representation in architecture, including the synthesis of studio work using a variety of visual media. Concurrently with ARCH 471 or after a spring term abroad. RP ½ Course cr

\* **ARCH 490a, Senior Research Colloquium** Karla Britton

Examination of the skills, topics, and preparation required for the research that students in the history, theory, and criticism track undertake for their senior project. Under the guidance of the instructor and members of the Architecture faculty and visitors, students present and define their proposals, complete basic readings, and seek criticism of individual research agendas.

\* **ARCH 491b, Senior Project** Staff

An essay or project in the student's area of concentration. Students in the history, theory, and criticism track or in the urban studies track pursue independent research with an adviser; this project must terminate in a senior essay.

\* **ARCH 494b, Senior Project Design Studio** Steven Harris

Individual design investigations, focusing on independence and precision in the deployment of design ideas. Reliance on visual and nonverbal presentations. Development of a three-dimensional component, such as large-scale mock details, or other visual means of presentation, which might include photography, film, video, or



interactive media. Examination of the skills, topics, and preparation to support design research. 1½ Course cr

\* **ARCH 495a, Senior Research Colloquium for Urban Studies** Karla Britton  
Development of frameworks and urban strategies for senior projects and/or papers through identification and elaboration of a research topic that synthesizes the interdisciplinary course work of the urban studies curriculum with individual interests. Requirements include proposal drafts, case study research, analyses, and graphic illustrations.

## Art

### (Drawing, Filmmaking, Graphic Design, Painting, Photography, Printmaking, and Sculpture)

Director of undergraduate studies: Lisa Kereszi, 122 GRN, 432-2600, art.dus@yale.edu; art.yale.edu

#### MEMBERS OF THE SCHOOL OF ART TEACHING IN YALE COLLEGE

**Professors** Rochelle Feinstein, Samuel Messer (*Adjunct*), Robert Reed, Jr., Michael Roemer (*Adjunct*), Robert Storr

**Associate Professors** Gregory Crewdson, Anoka Faruquee, Martin Kersels

**Assistant Professors** Marie Lorenz, Michael Queenland

**Senior Critics** Alice Chung, John Gambell, Pamela Hovland, Christopher Pullman, Douglass Scott, Henk van Assen

**Critics** Johannes DeYoung, Lisa Kereszi, Sandra Luckow, Sarah Oppenheimer

**Lecturers** Jonathan Andrews, Mark Aronson, Anna Betbeze, Julian Bittiner, Sandra Burns, Susan Cahan, Yeju Choi, Benjamin Donaldson, Munro Galloway, Julian Gilbert-Davis, Kate Greene, Curran Hatleberg, Elana Herzog, Brent Howard, Joy Kim, Sarah Lasley, Michelle Lopez, Meredith Miller, Dushan Petrovich, Carolyn Salas, Laurel Schwulst, Scott Stowell, Ka-Man Tse, William Villalongo, Anahita Vossoughi, Natalie Westbrook

Students in the Art major develop an understanding of the visual arts through a studio-based curriculum, apply fundamentals of art across a variety of media and disciplines, relate the practice of making art to the fields of art history and theory, and gain a high level of mastery of at least one artistic discipline. Students may concentrate on a medium such as painting/printmaking, sculpture, graphic design, photography, or film.

Courses in Art are open to all undergraduate students. In cases where student demand for entry into a course is greater than can be accommodated, priority will be given to School of Art students and declared Art majors. The director of undergraduate studies and members of the Art faculty will be present for counseling on Tuesday, August 26, from 10:30 a.m. to 1:30 p.m. adjacent to the School of Art Gallery at Holcombe T. Green, Jr., Hall, 1156 Chapel Street. Students seeking advice about course selection or the program in Art should come at that time. Others wishing to elect Art courses should go to the first meeting of the class, when each instructor will determine the

class enrollment. Classes begin on Wednesday, August 27. For courses beginning in the spring term, counseling will be held on Monday, January 12, 2015, from 12 noon to 1:30 p.m. adjacent to the School of Art Gallery; Art classes begin on Tuesday, January 13, 2015. All Art majors are required to register with the director of undergraduate studies at the beginning of each term at the time and place listed above in order to be enrolled or to continue in the major.

The prerequisites for acceptance into the major are a sophomore review, which is an evaluation of work from studio courses taken at the Yale School of Art, and five introductory (100-level) term courses. Four of the introductory courses must have been completed at the time of the sophomore review. Visual Thinking (ART 111) and Basic Drawing (ART 114) are mandatory. At the time of the review, the student should be enrolled in the fifth 100-level prerequisite course. In exceptional cases, arrangements for a special review during the junior year may be made with the director of undergraduate studies.

**Requirements of the major** The Art major requires fourteen term courses, including the following: (1) five prerequisite courses at the 100 level (including Basic Drawing and Visual Thinking); (2) four courses at the 200 level or above; (3) the Junior Seminar (ART 395) or Critical Theory in the Studio (ART 201); (4) the yearlong Senior Project (ART 495 and 496); and (5) two term courses in the history of art. Program guidelines and specific requirements for the various areas of concentration are described below.

**Area of concentration** Each Art major selects an area of concentration from five possible choices: (1) graphic design, (2) painting/printmaking, (3) photography, (4) sculpture, and (5) filmmaking. Required courses for the *graphic design concentration* include ART 132, Introduction to Graphic Design; ART 264 and 265, Typography in Graphic Design I and II; ART 368, Intermediate Graphic Design, or ART 369, Interactive Design; and ART 468 and 469, Advanced Graphic Design I and II. The *painting/printmaking concentration* requires ART 116, Color; ART 130, Painting Basics, or ART 230 or 231, Introductory Painting; ART 330 and 331, Intermediate Painting I and II; ART 224, Figure Drawing, or ART 356, Printmaking I; and ART 430, Painting Studio. Students in the *photography concentration* take ART 136, Introductory Black-and-White Photography, or ART 138, Digital Photography; ART 237, Intermediate Photography; ART 338, Intermediate Digital Photography; ART 379, Photographic Techniques; and ART 401, Advanced Photography. The *sculpture concentration* requires ART 110, Sculpture Basics; ART 345 and 346, Intermediate Sculpture I and II; ART 371, Sound Art, or ART 348, Sculpture with Time-Based Mediums; and ART 445, Advanced Sculpture I. Required courses for the *filmmaking concentration* include ART 141 and 142, Language of Film Workshop I and II; ART 341, Intermediate Fiction Film Workshop; ART 342, Intermediate Documentary Film Workshop; and ART 442 and 443, Advanced Film Workshop I and II. Students in the filmmaking concentration may substitute courses in film studies for the history of art requirement.

**Summer fellowship** Art majors are eligible for the Ellen Battell Stoeckel Fellowship for study at the Yale University Summer School of Music and Art at Norfolk, Connecticut. Applicants for the program must be officially classified as junior Art majors and be returning to Yale for two terms of their senior year. The program awards up to four course credits for work successfully completed. These credits cannot be used toward the

requirements of the Art major; however, they may be counted toward the 36-course-credit graduation requirement.

**Repeated and outside courses** Some Art courses may be repeated for credit, with permission of both the instructor and the director of undergraduate studies. Course credits in studio art earned at other institutions may be applied toward the requirements of the major, at the discretion of the director of undergraduate studies and subject to a faculty review process.

**Facilities fees** All Art majors are charged a facilities access and user fee of \$200 per term. Additional materials fees are levied in individual courses, as specified at the end of the course description.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** Favorable faculty review of work done in studio courses before end of sophomore year; ART 111 and 114; 3 addtl 100-level courses

**Number of courses** 14 term courses (incl prereqs and yearlong senior project)

**Specific course required** *All concentrations*—ART 395 or 201; *Graphic design*—ART 132, 264, 265; ART 368 or 369; ART 468, 469; *Painting/printmaking*—ART 116; ART 130, 230, or 231; ART 330, 331; ART 224 or 356; ART 430; *Photography*—ART 136 or 138; ART 237, 338, 379, 401; *Sculpture*—ART 110, 345, 346; ART 371 or 348; ART 445; *Filmmaking*—ART 141, 142, 341, 342, 442, 443

**Distribution of courses** 5 courses at 100 level (incl prereqs); 4 courses at 200 level or above; 2 courses in hist of art

**Senior requirement** Senior project (ART 495 and 496)

**Substitution permitted** *Filmmaking concentration*—2 courses in film studies for hist of art req

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Unless otherwise indicated, spring-term classes in Art begin on Tuesday, January 13, 2015.

## Introductory Courses

### [ ART 001, Studies in Visual Biography ]

\* **ART 002b, Paper** Elana Herzog

Paper as a material for making art. How paper is made; myriad ways that it is used in the collections of Yale's galleries and libraries. Creation of paper objects to explore the formal properties of sculpture, including volume, mass, line, and structure. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

RP

### [ ART 003, Blue ]

\* **ART 004a, Words and Pictures** Dushan Petrovich

Introduction to visual narration, the combination of words and pictures to tell a story. Narrative point of view, counternarrative and counterculture, visual satire, personal history, depictions of space and time, and strategies and politics of representation. Sources include illuminated manuscripts, biblical paintings, picture-stories, comic strips, and graphic novels. HU RP

\* **ART 005a, Interactive Concrete Poetry** Laurel Schwulst

Exploration of concrete poetry, a genre that uses semantic, visual, and phonetic elements of language as raw materials to arrange words in space. Survey of concrete poetry as an international historic art movement from the 1950s through the 1970s. Students create their own poems that respond to contemporary ideas of digital space. Introduction to basic code languages such as HTML and CSS. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. RP

\* **ART 006a, Art of the Printed Word** Richard Rose

Introduction to the art and historical development of letterpress printing and to the evolution of private presses. Survey of hand printing; practical study of press operations using antique platen presses and the cylinder proof press. Material qualities of printed matter, connections between content and typographic form, and word/image relationships. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **ART 110a or b, Sculpture Basics** Michelle Lopez

Introduction to the concepts of space, form, weight, mass, and design in sculpture. Basic types and techniques of construction and material; concepts and approaches to the understanding and development of sculptural ideas. Shops and studio are available during days and evenings throughout the week. Materials fee: \$75. Enrollment limited to 12. Recommended to be taken before ART 120–125. HU RP

\* **ART 111a or b, Visual Thinking** Staff

An introduction to the language of visual expression, using studio projects to explore the fundamental principles of visual art. Students acquire a working knowledge of visual syntax applicable to art and to the study of art history and popular culture. Projects address all four major concentrations (graphic design, printing/printmaking, photography, and sculpture). Materials fee: \$25. Open to all undergraduates. Required for Art majors. HU RP

\* **ART 114a or b, Basic Drawing** Staff

An introduction to drawing, emphasizing articulation of space and pictorial syntax. Class work is based on observational study. Assigned projects address fundamental technical and conceptual problems suggested by historical and recent artistic practice. No prior drawing experience required. Materials fee: \$25. Open to all undergraduates. Required for Art majors. HU RP

\* **ART 116b, Color in Artistic Practice** Munro Galloway

Study of the interactions of color, ranging from fundamental problem solving to individually initiated expression. The collage process is used for most class assignments. Materials fee: \$25. HU RP

**ART 120a, Object and Space (in Wood)** Julian Gilbert-Davis

Introduction to wood technology and the use of machines and hand tools in context of the studio. The range of what sculpture might be; understanding and articulating form in space; responses to current issues in contemporary sculpture. Assignments foster hands-on appreciation of materials and craftsmanship and initiate awareness of the aesthetic and political implications of handmade objects in a digital world. Shops and studio are available during days and evenings throughout the week. Materials fee: \$75. Enrollment limited to 12. HU

**ART 121b, Structure and Form (in Metal)** Brent Howard

Introduction to working with metal through examination of the framework of cultural and architectural forms. Focus on the comprehensive application of construction in relation to concept. Instruction in welding and general metal fabrication. Ways in which the meaning of work derives from materials and the form those materials take. Materials fee: \$75.00. Prerequisite: ART 110. HU

**\* ART 122a, Digital Forms in Time** Sandra Burns

Ways in which digital tools can inform the production of three-dimensional objects. Digital photography, including RAW photography, video, editing, basic lighting, color correction, and inkjet printing. Introduction to basic woodworking and welding. Digital processes as they intersect with a variety of materials and subjects. Materials fee: \$150. Enrollment limited to 12. HU RP

**\* ART 125a, Sculpture in Reproduction** Carolyn Salas

Instruction in the practical aspects of mold making and casting in a variety of materials and techniques. Discussion of contemporary issues in art and culture, including the use of traditional principles in sculpture in an age of mass production. Methods include waste molds, piece molds, life casts, and flexible molds. Materials fee: \$75. HU RP

**\* ART 130a or b, Painting Basics** Staff

An introduction to basic painting issues, including the conventions of pictorial space and the language of color. Class assignments and individual projects explore technical, conceptual, and historical issues central to the language of painting. Materials fee: \$75. Intended for students not majoring in Art and for Art majors outside the painting concentration. Students who intend to pursue the painting concentration or take multiple courses in painting should take ART 230 and/or 231. HU RP

**\* ART 132a or b, Introductory Graphic Design** Staff

A studio introduction to visual communication, with emphasis on the visual organization of design elements as a means to transmit meaning and values. Topics include shape, color, visual hierarchy, word-image relationships, and typography. Development of a verbal and visual vocabulary to discuss and critique the designed world. Materials fee: \$150. HU RP

**\* ART 136a or b, Introductory Black-and-White Photography** Staff

An introductory course in black-and-white photography concentrating on the use of 35mm cameras. Topics include the lensless techniques of photograms and pinhole photography; fundamental printing procedures; and the principles of film exposure and development. Assignments encourage the variety of picture-forms that 35mm cameras can uniquely generate. Student work is discussed in regular critiques. Readings examine the invention of photography and the flâneur tradition of small-camera photography as exemplified in the work of artists such as Henri Cartier-Bresson, Helen Levitt, Robert Frank, and Garry Winogrand. Materials fee: \$150. HU RP

**\* ART 138a or b, Digital Photography** Staff

An introductory exploration of the transition of photographic processes and techniques into digital formats. Students produce original work using a digital camera. Introduction to a range of tools including color correction, layers, making selections, and inkjet printing. Assignments include weekly critiques and a final project. Materials fee: \$150. HU RP

\* **ART 141a, Introductory Film Writing and Directing** Michael Roemer

Problems and aesthetics of film studied in practice as well as in theory. In addition to exploring movement, image, montage, point of view, and narrative structure, students photograph and edit their own short videotapes. Emphasis on the writing and production of short dramatic scenes. Materials fee: \$150. Priority to majors in Art and in Film Studies. Prerequisite for Film Studies majors: FILM 150. RP

\* **ART 142b, Introductory Documentary Filmmaking** Sandra Luckow

The art and craft of documentary filmmaking. Basic technological and creative tools for capturing and editing moving images. The processes of research, planning, interviewing, writing, and gathering of visual elements to tell a compelling story with integrity and responsibility toward the subject. The creation of nonfiction narratives. Issues include creative discipline, ethical questions, space, the recreation of time, and how to represent "the truth." Materials fee: \$150. RP

\* **ART 145a or b, Introduction to Digital Video** Sarah Lasley

Introduction to the basic tools of digital video production. DV camera operation, sound, and Mac-based editing with Final Cut Pro software. Individual and collaborative assignments explore the visual language and production challenges of DV. Emphasis on the spatial and visual aspects of the medium rather than the narrative. Screenings of experimental film, video art, and DV feature films. Materials fee: \$150. Enrollment limited to 12. RP

**ART 185a, Principles of Animation** Johannes DeYoung

The physics of movement in animated moving-image production. Focus on historical and theoretical developments in animation of the twentieth and twenty-first centuries as frameworks for the production of animated film and visual art. Classical animation and digital stop-motion; fundamental principles of animation and their relation to traditional and digital technologies. Materials fee: \$150. RP

## Intermediate Courses

\* **ART 201b, Critical Theory in the Studio** Joy Kim

Key concepts in modern critical theory as they aid in the analysis of creative work in the studio. Psychoanalysis, Marxism, feminism, structuralism, and poststructuralism examined in relation to modern and contemporary movements in the visual arts, including cubism, surrealism, Arte Povera, pop, minimalism, conceptual art, performance art, the Pictures group, and the current relational aesthetics movement. Materials fee: \$25. HU RP

\* **ART 202b / HSAR 207b / WGSS 204b, Feminist Theory and Feminist Art**

Susan Cahan

Major issues in feminist theory and art practice since the 1960s. Topics include women's art of the 1960s and 1970s, performance and body art, representation and the social construction of gender, and the intersection of gender, race, sexuality, and class. Materials fee: \$25. HU RP

[ **ART 210, Sculpture as Object** ]

**\* ART 223a and ART 224b, Figure Drawing** Staff

A study of the human figure, using a range of approaches. Emphasis on observation, anatomy, and spatial structure. Historical examples from cave painting to contemporary art. Materials fee: \$75 per term. RP

**ART 230a and ART 231b, Introductory Painting** Robert Reed

An introduction to concepts and techniques in painting through observational study, with emphasis on the language of color and the articulation of space. Study of pictorial syntax in historical painting; mastery of materials and techniques. Materials fee: \$75 per term. Enrollment limited to 15. Prerequisite or corequisite: ART 114. RP

**\* ART 235a / THST 235a, Dance Theater** Emily Coates

A practical and theoretical survey of dance theater history. Introduction to movement vocabularies, physical techniques, and repertoire from post-1950 modern and postmodern dance theater. Open to students of all levels and majors. HU

**\* ART 237a or b, Intermediate Photography** Lisa Kereszi

A class in black-and-white photography extending the concerns of ART 136. Introduction to the use of medium-format cameras. Specialized topics include night photography, the use of flash, developing roll film, basic digital scanning, and grayscale printing techniques. Survey of the rich tradition of handheld photography and the production of artists such as Lartigue, Brassai, Diane Arbus, Lee Friedlander, and Robert Adams. Materials fee: \$150. Prerequisite: ART 136 or equivalent. HU RP

**[ ART 245, Digital Projection ]**

**\* ART 264a, Typography in Graphic Design I** Alice Chung

An intermediate course on the fundamentals of typography, with emphasis on the way typographic form and visual arrangement create and support content. Focus on designing and making books, employing handwork and computer technology. Typographic history and theory discussed in relation to course projects. Materials fee: \$150. Prerequisite: ART 132. RP

**\* ART 265b, Typography in Graphic Design II** Henk Van Assen

Continued studies in typography, incorporating more advanced and complex problems. Exploration of grid structures, sequentiality, and typographic translation, particularly in the design of contemporary books, and screen-based kinetic typography. Relevant issues of design history and theory discussed in conjunction with studio assignments. Materials fee: \$150. Prerequisite: ART 264. RP

**\* ART 285b, Digital Animation** Johannes DeYoung

Introduction to the principles, history, and practice of animation in visual art and film. Historical and theoretical developments in twentieth- and twenty-first-century animation used as a framework for making digital animation. Production focuses on digital stop-motion and compositing, as well as 2-D and 3-D computer-generated animation. Workshops in relevant software. Materials fee: \$150. Prerequisites: ART 111, 114, or 145, and familiarity with Macintosh-based platforms. RP

**\* ART 324b, Painting Materials and Methods** Mark Aronson

An introduction to historical materials and methods of painting. Students examine masterworks in the Yale Art Gallery and the Center for British Art, and explore observed techniques in their own painting. Techniques include quick-drying indirect tempera, slow-drying and layered oil painting, and the modernist direct application of

paint; supports include wood, canvas, paper, and metal. Materials fee \$75. Prerequisite: ART 114 or 130 or permission of instructor. RP

**\* ART 331b, Intermediate Painting** William Villalongo

Further exploration of concepts and techniques in painting, emphasizing the individuation of students' pictorial language. Various approaches to representational and abstract painting. Studio work is complemented by in-depth discussion of issues in historical and contemporary painting. Materials fee: \$150 per term. Prerequisite: ART 230 or 231. RP

**ART 332a, Painting Time** Samuel Messer

Painting techniques paired with conceptual ideas that explore how painting holds time both metaphorically and within the process of creating a work. Use of different Yale locations as subjects for observational on-site paintings. Materials fee: \$75. Prerequisite: ART 130, 230, or 231, or with permission of instructor. HU RP

**ART 338a, Intermediate Digital Photography** Meredith Miller

Exploration of both the technical and conceptual aspects of digital photography. Range of tools includes advanced film scanning, working with RAW files, masks, compositing and grayscale, and color inkjet printing. Students produce original work, with special attention to ways in which their technical decisions can clarify their artistic intentions. Materials fee: \$150. Prerequisite: ART 138. RP

**ART 341a or b, Intermediate Film Writing and Directing** Staff

In the first half of the term, students write three-scene short films and learn the tools and techniques of staging, lighting, and capturing and editing the dramatic scene. In the second half of the term, students work collaboratively to produce their films. Focus on using the tools of cinema to tell meaningful dramatic stories. Materials fee: \$150. Enrollment limited to 8. Priority to majors in Art and in Film Studies. ART 141 or 142, and FILM 150 RP

**ART 342b, Intermediate Documentary Filmmaking** Sandra Luckow

Students explore the storytelling potential of the film medium by making documentary art. The class concentrates on finding and capturing intriguing, complex scenarios in the world and then adapting them to the film form. Questions of truth, objectivity, style, and the filmmaker's ethics are considered using examples of students' work. Exercises in storytelling principles. Materials fee: \$150. Limited enrollment. Priority to majors in Art and in Film Studies. Prerequisites: ART 141 or 142, and FILM 150. HU RP

**ART 345a and ART 346b, Dematerial/Material** Staff

Further investigation into the history of sculpture and questions pertinent to contemporary art. Exploration of new techniques and materials along with refinement of familiar skills. Focus on helping students become self-directed in their work. Individual and group discussion and visits to museums and galleries. Materials fee: \$75 per term. Enrollment limited to 12. Prerequisite: ART 120, 121, or 122, or equivalent; or with permission of instructor. RP

**\* ART 348b, Body, Space, and Time** Sandra Burns

Exploration of time-based art mediums such as moving-image work, performance, sound, and installation, with emphasis on the integration and manipulation of different mediums and materials. Ways in which the history of time-based works informs contemporary practice. Individual studio projects as well as workshops in the use of



various processes, practices, and techniques. Materials fee: \$75. Enrollment limited to 12. Prerequisite: ART 122 or permission of instructor. HU RP

**\* ART 355b, Silkscreen Printing** Marie Lorenz

Presentation of a range of techniques in silkscreen and photo-silkscreen, from hand-cut stencils to prints using four-color separation. Students create individual projects in a workshop environment. Materials fee: \$150. Prerequisite: ART 114 or equivalent. HU RP

**ART 356a, Printmaking I** Marie Lorenz

Instruction in a diverse range of printmaking media. Students develop work in linocut, woodcut, collograph, drypoint, and etching. Methods in both color and black and white. Materials fee: \$150. Prerequisite: ART 114 or equivalent. RP

**[ ART 359, Lithography ]**

**\* ART 368a, Intermediate Graphic Design I** Pamela Hovland

Various ways that design functions; how visual communication takes form and is recognized by an audience. Core issues inherent in design: word and image, structure, and sequence. Analysis and refinement of an individual design methodology. Attention to systematic procedures, techniques, and modes of inquiry that lead to a particular result. Materials fee: \$150. Prerequisite: ART 132 and 264, or permission of instructor. RP

**\* ART 369b, Interactive Design** Laurel Schwulst

Interactive design explored through the development of projects that are based on line. Concepts of prompt, feedback, and variable conditions; Web-specific design issues such as navigation and pacing, as well as design for variable sizes and devices; best practices in code craft and design. The Web as a social ecosystem in which time and performance play important roles. Instruction in HTML, CSS, and some Javascript. No prior programming experience required. Materials fee: \$150. Prerequisite: ART 132 or permission of instructor. RP

**ART 370a, Motion Design** Christopher Pullman

A studio class that explores how the graphic designer's conventions of print typography and the dynamics of word-image relationship change with the introduction of time, motion, and sound. Projects focus on the controlled interaction of words and images to express an idea or tell a story. The extra dimensions of time-based communications; choreography of aural and visual images through selection, editing, and juxtaposition. Materials fee: \$150. Prerequisite: ART 265; ART 368 recommended. RP

**[ ART 371, Sound Art ]**

**\* ART 379b, Photographic Techniques** Benjamin Donaldson

An opportunity for experienced photography students to become involved with the technical aspects of the medium. Concentrated study of view camera operations; techniques in added lighting and advanced printing; scanning and printing of negatives; discussion of historic photographic traditions. Student work is discussed in regular critiques. Previous digital training may be employed, but focus is primarily analog. Materials fee: \$150. Prerequisite: ART 237 or permission of instructor. RP

**\* ART 386a / THST 402a, Experimental Writing and Performance** Dominika Laster

A practical and theoretical exploration of the relationship between creative and critical writing and contemporary performance. Includes field trips to the Brooklyn Academy

of Music's Next Wave Festival. Admission by application with writing sample. WR, HU

\* **ART 387b / PLSH 447b / THST 447b, Objects in Performance** Dominika Laster  
Examination of the meanings and functions of material objects in performance and of the performer-object relation, with attention to historical, theoretical, and practical perspectives. Focus on the work of Tadeusz Kantor, the Polish painter, assemblage artist, set designer, and theater director. Development of a devised theatrical work that culminates in a public performance. Admission by interview or audition. HU

\* **ART 389b / THST 395b, Postmodern Dance** Emily Coates  
A studio-based exploration of the epochal shift in choreographic aesthetics known as postmodern dance. The social and historical context in which postmodern dance emerged, including the reconstruction of key dances from the 1960s and 1970s; the evolution of postmodern dance aesthetics into the twenty-first century. HU

\* **ART 395a, Junior Seminar** Dushan Petrovich  
Ongoing visual projects addressed in relation to historical and contemporary issues. Readings, slide presentations, critiques by School of Art faculty, and gallery and museum visits. Critiques address all four areas of study in the Art major. Prerequisite: at least four courses in Art. RP

## Advanced Courses

\* **ART 401b, Advanced Photography** Gregory Crewdson  
An exploration of the practice of photography, either analog or digital. Student work is discussed in regular critiques, and lectures are framed around the aesthetic concerns that the work provokes. Materials fee: \$150. Prerequisites: ART 379 and, for those working digitally, ART 138. Required for Art majors concentrating in photography. RP

**ART 430a and ART 431b, Advanced Painting Studio** Staff  
Development of individual themes through independent studio practice and projects. Studio work and discussion of pertinent topics in historical and contemporary painting. May be taken more than once. Materials fee: \$75. Prerequisites: ART 330, 331. RP

\* **ART 442a and ART 443b / FILM 483a and FILM 484b, Advanced Film Writing and Directing** Jonathan Andrews  
A yearlong workshop designed primarily for Art and Film Studies majors making senior projects. Each student writes and directs a short fiction film. The first term focuses on the screenplay, production schedule, storyboards, casting, budget, and locations. In the second term students rehearse, shoot, edit, and screen the film. Materials fee: \$150. Enrollment limited to 8. Priority to majors in Art and in Film Studies. Enrollment limited to 8. Priority to majors in Art and in Film Studies. Prerequisite: ART 341.

**ART 446b, Advanced Sculpture** Martin Kersels  
Self-directed work in sculpture. Group discussion of student projects, with readings, slides, and videos that address current art practices. Regular individual and group critiques. Materials fee: \$75 per term. Enrollment limited to 12. Prerequisite: ART 345 or 346 or equivalent, or permission of instructor. RP

**\* ART 457b, Printmaking II** Marie Lorenz

Individual projects in a range of media: relief methods, etching, lithography, and silkscreen. Group projects to create a suite of prints or a book. Emphasis on contemporary printmaking practices that are both traditional and transmedia. Materials fee: \$150. Recommended to be taken concurrently with ART 331 or 431. Prerequisite: at least one term of printmaking. RP

**ART 468a and ART 469b, Advanced Graphic Design** Staff

A probe into questions such as how an artist can be present as an idiosyncratic individual in his or her work, and how that work can still communicate on its own to a broad audience. Concentration on making graffiti, i.e., the design of a set of outdoor marks and tours for New Haven. A technological component is included, both in the metaphor of designing outdoor interaction as a way to learn about screen-based interaction and in the final project to design an interface for a handheld computer. Materials fee: \$150 per term. Prerequisites: ART 264 or 265, and 367 or 368, or permission of instructor. RP

**\* ART 471a and ART 472b, Independent Projects** Staff

Independent work that would not ordinarily be accomplished within existing courses, designed by the student in conjunction with a School of Art faculty member. A course proposal must be submitted on the appropriate form for approval by the director of undergraduate studies and the faculty adviser. Expectations of the course include regular meetings, end-of-term critiques, and a graded evaluation. RP

**\* ART 495a or b, Senior Project** Staff

A project of creative work formulated and executed by the student under the supervision of an adviser designated in accordance with the direction of the student's interest. Proposals for senior projects are submitted on the appropriate form to the School of Art Undergraduate Studies Committee (USC) for review and approval at the end of the term preceding the last resident term. Projects are reviewed and graded by an interdisciplinary faculty committee made up of members of the School of Art faculty. An exhibition of selected work done in the project is expected of each student. RP

## Astronomy

Director of undergraduate studies: Debra Fischer, 259 JWG, 432-1613, astro.dus@yale.edu [F]; to be announced [Sp]; www.astro.yale.edu

### FACULTY OF THE DEPARTMENT OF ASTRONOMY

**Professors** Charles Bailyn, † Charles Baltay, Sarbani Basu, Paolo Coppi, Pierre Demarque (*Emeritus*), Debra Fischer, Marla Geha, Jeffrey Kenney, Richard Larson (*Emeritus*), Priyamvada Natarajan, † C. Megan Urry, William van Altena (*Emeritus*), Pieter van Dokkum (*Chair*), Robert Zinn

**Associate Professors** Hector Arce, † Daisuke Nagai, Frank van den Bosch

**Assistant Professor** † Nikhil Padmanabhan

**Lecturers** Louise Edwards, Michael Faison

† A joint appointment with primary affiliation in another department.

Astronomy is a quantitative physical science that applies physics, mathematics, and statistical analysis to observing, describing, and modeling the universe. The undergraduate courses and degree programs offered by the Department of Astronomy train students in research techniques and quantitative reasoning and develop creative problem solvers. Students who complete the major continue on to top-tier graduate programs in astrophysics or related science fields, and they are sought after by employers in a range of fields from health care management to the banking and investment industry. The department offers a B.A. degree in Astronomy and a B.S. degree in Astrophysics.

**Introductory courses with no prerequisites** The department offers a variety of courses without prerequisites that provide an introduction to astronomy with particular attention to recent discoveries and theories. Courses numbered below 150 are intended for students who desire a broad, nontechnical introduction to astronomy. These courses fulfill the science distributional requirement, and some also fulfill the quantitative reasoning distributional requirement.

Courses with numbers between 150 and 199 are topical rather than survey courses. These offerings fulfill both the science and the quantitative reasoning requirements. ASTR 155 is a laboratory course that provides a hands-on introduction to astronomical observing. ASTR 160 and 170 provide an introduction to frontier topics in modern astrophysics and cosmology.

**Introductory courses with high school calculus and physics prerequisites** Students who have taken calculus and physics in high school can enroll in quantitative introductory courses. ASTR 210 and 220 focus on fundamental measurements and tools used in astronomy and include an in-depth study of stellar astrophysics (ASTR 210) or galaxies and cosmology (ASTR 220). These courses overlap in content, so students should take either ASTR 210 or 220 but not both. ASTR 255 provides training in data analysis and research techniques, including computer programming and numerical and statistical analysis.

**Advanced electives** Courses numbered 300 and above are more specialized and intensive. The prerequisites for these courses include ASTR 210 or 220, multivariable calculus, and two terms of introductory college physics.

Graduate courses in astronomy are open to qualified undergraduates who already have a strong preparation in mathematics, physics, and astronomy. Students wishing to take a graduate course must first obtain the permission of the instructor and of the director of graduate studies.

**Requirements of the major for the Class of 2016 and previous classes** Students in the Class of 2016 and previous classes may fulfill the requirements of the major in Astronomy that were in place when they entered the major, as described in previous editions of this bulletin (<http://www.yale.edu/printer/bulletin/archivepdf/files/YCPS>). Alternatively, they may fulfill the requirements of the major as described below for the Class of 2017 and subsequent classes.

**Requirements of the B.A. degree program for the Class of 2017 and subsequent classes** The B.A. degree program in Astronomy is designed for students who do not plan to continue in a graduate program in astronomy, but who are interested in the

subject as a basis for a liberal arts education or as a physical science background to careers such as medicine, teaching, journalism, business, law, or government. It allows greater flexibility in course selection than the B.S. program because the emphasis is on breadth of knowledge rather than on specialization.

The prerequisites for the B.A. program are PHYS 170 and 171, or 180 and 181, or 200 and 201, and MATH 112 and 115. Ten courses are required beyond these prerequisites, including either ASTR 210 or 220, ASTR 255, 310, one additional Astronomy elective numbered 150 or above, and the senior requirement (ASTR 490 or 491). Two of the ten courses must be advanced courses in mathematics, such as MATH 120 or ENAS 151, or courses in mathematical methods, including statistics or computer science, such as CPSC 112, MATH 200 or above, or ASTR 356. Three electives can be drawn from any of the natural, applied, or mathematical sciences (including additional astronomy courses); at least two of these must be advanced enough to have college-level prerequisites. The senior requirement consists of a senior essay or independent research project carried out for one term in ASTR 490 or 491 under the supervision of a faculty member.

Before entering the junior year, students should consult the director of undergraduate studies.

**Requirements of the B.S. degree program for the Class of 2017 and subsequent classes** The B.S. degree program in Astrophysics is designed to provide a strong foundation in astrophysics for students interested in graduate study or a career in astronomy, physics, or a related science.

Prerequisites for the B.S. degree include an introductory physics sequence (PHYS 180 and 181, or 200 and 201, or 260 and 261); a physics laboratory sequence (PHYS 165L and 166L, or 205L and 206L); and the mathematics sequence MATH 112, 115 and either MATH 120 or ENAS 151. ASTR 155 may be substituted for one term of the physics laboratory sequence. All prerequisites should be completed by the end of the sophomore year.

Beyond the prerequisites, twelve term courses are required in astronomy, physics, and mathematics. Students complete at least six courses in astronomy, including either ASTR 210 or 220, 255, 310, 320, and a two-term senior project (ASTR 490 and 491). Students also complete three Physics courses numbered 400 or above, normally PHYS 401, 402, and 439. In addition, majors choose either one additional 400-level course in Physics or an Astronomy elective numbered 300 or higher. In mathematics, students complete a course in differential equations selected from MATH 246, PHYS 301, or ENAS 194, and either an additional mathematics course numbered 200 or above or a course in statistics or computing such as CPSC 112, 201, or ASTR 356. The senior requirement consists of an independent research project in astronomy carried out for two terms in ASTR 490 and 491 under the supervision of a faculty member.

Before entering the junior year, students must obtain approval of a course of study from the director of undergraduate studies.

#### REQUIREMENTS OF THE MAJOR ASTRONOMY, B.A.

**Prerequisites** PHYS 170, 171, or 180, 181, or 200, 201; MATH 112, 115

**Number of courses** 10 courses beyond prereqs, incl senior req

**Specific courses required** ASTR 210 or 220, 255, 310

**Distribution of courses** 1 astronomy elective numbered 150 or above; 2 advanced math courses; 3 science electives (may include addtl astronomy courses), at least 2 with college-level prereqs

**Senior requirement** Senior essay or senior research project (ASTR 490 or 491)

### **ASTROPHYSICS, B.S.**

**Prerequisites** PHYS 180, 181, or 200, 201, or 260, 261; PHYS 165L, 166L, or 205L, 206L; MATH 112, 115; MATH 120 or ENAS 151

**Number of courses** 12 courses beyond prereqs, incl senior req

**Specific courses required** ASTR 210 or 220; ASTR 255, 310, 320

**Distribution of courses** 3 courses in physics numbered 400 or above; 1 addtl upper-level course in astronomy or physics; 2 courses in math or mathematical methods, as specified

**Substitution permitted** ASTR 155 for 1 term of physics lab prereq

**Senior requirement** Senior independent research project (ASTR 490 and 491)

## **Courses**

\* **ASTR 030a, Search for Extraterrestrial Life** Michael Faison

Introduction to the search for extraterrestrial life. Review of current knowledge on the origins and evolution of life on Earth; applications to the search for life elsewhere in the universe. Discussion of what makes a planet habitable, how common these worlds are in the universe, and how we might search for them. Survey of past, current, and future searches for extraterrestrial intelligence. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, SC

\* **ASTR 040b, Expanding Ideas of Time and Space** Louise Edwards

Introduction to cosmology through critical exploration of everyday notions of space and time. Topics include the natures of nothing, time, space, and light; the shape of the universe; special and general relativity; dark and light matter; and dark energy. Observations and ideas that support astronomers' current model of the universe as an expanding and accelerating four-dimensional space-time. SC

**ASTR 110a, Planets and Stars** Louise Edwards

An introduction to stars and planetary systems. Topics include the solar system and extrasolar planets, planet and stellar formation, and the evolution of stars from birth to death. No prerequisite other than a working knowledge of elementary algebra. QR, SC

**ASTR 120b, Galaxies and the Universe** Michael Faison

An introduction to stars and stellar evolution; the structure and evolution of the Milky Way galaxy and other galaxies; quasars, active galactic nuclei, and supermassive black holes; cosmology and the expanding universe. No prerequisite other than a working knowledge of elementary algebra. QR, SC

**ASTR 130a, Origins and the Search for Life in the Universe** Debra Fischer

Origins of the universe, stars, and planets; evolution of conditions that were conducive to the emergence of life on Earth; leading theories for the origin of life; the discovery of exoplanets; comparison of Earth's solar system with other systems that have been

discovered; the possibility of habitable conditions where life might have arisen on other worlds; methods of searching for life elsewhere. No prerequisite other than a working knowledge of elementary algebra. SC

[ **ASTR 135, Archaeoastronomy** ]

**ASTR 155a, Introduction to Astronomical Observing** Michael Faison

A hands-on introduction to the techniques of astronomical observing. Observations of planets, stars, and galaxies using on-campus facilities and remote observing with Yale's research telescopes. Use of electronic detectors and computer-aided data processing. Evening laboratory hours required. One previous college-level science laboratory or astronomy course recommended. SC ½ Course cr

**ASTR 160b, Frontiers and Controversies in Astrophysics** Louise Edwards

A detailed study of three fundamental areas in astrophysics that are currently subjects of intense research and debate: planetary systems around stars other than the sun; pulsars, black holes, and the relativistic effects associated with them; and the age and ultimate fate of the universe. No prerequisite other than a working knowledge of elementary algebra. QR, SC

[ **ASTR 170, Introduction to Cosmology** ]

**ASTR 210b, Stars and Their Evolution** Robert Zinn

Foundations of astrophysics, focusing on an intensive introduction to stars. Nuclear processes and element production, stellar evolution, stellar deaths and supernova explosions, and stellar remnants including white dwarfs, neutron stars, and black holes. A close look at our nearest star, the sun. How extrasolar planets are studied; the results of such studies. Prerequisite: a strong background in high school calculus and physics. May not be taken after ASTR 220. QR, SC

**ASTR 220a, Galaxies and Cosmology** Louise Edwards

An intensive introduction to extragalactic astronomy. The structure and contents of galaxies, evolution of galaxies, observational cosmology, and the history of the universe. Prerequisite: a strong background in high school calculus and physics. May not be taken after ASTR 210. QR, SC

**ASTR 255a, Research Methods in Astrophysics** Marla Geha

The acquisition and analysis of astrophysical data, including the design and use of ground- and space-based telescopes, computational manipulation of digitized images and spectra, and confrontation of data with theoretical models. Examples taken from current research at Yale and elsewhere. Use of the Python programming language. Includes an optional field trip during October recess to the Arecibo 300-meter radio telescope. A background in high school calculus and physics. No previous programming experience required. QR, SC RP

**ASTR 310a, Galactic and Extragalactic Astronomy** Jeffrey Kenney

Stellar populations and the structure of the Milky Way galaxy; the structure and evolution of external galaxies; the distribution of galaxies in the universe; galaxy interactions and active galactic nuclei. Prerequisites: MATH 115, PHYS 201, and ASTR 210 or 220, or equivalents, or with permission of instructor. QR, SC

**ASTR 320b, Physical Processes in Astronomy** Franciscus van den Bosch

Introduction to the physics required for understanding current astronomical problems. Topics include basic equations of stellar structure, stellar and cosmic nucleosynthesis,

radiative transfer, gas dynamics, and stellar dynamics. Numerical methods for solving these equations. Prerequisites: MATH 120 and PHYS 201 or equivalents, or permission of instructor. Previous experience with computer programming recommended. Taught in alternate years. QR, SC

**ASTR 343b, Gravity, Astrophysics, and Cosmology** Nikhil Padmanabhan

In-depth discussion of the physics underlying several recent discoveries in astrophysics and cosmology, including extrasolar planets, black holes, and the accelerating universe. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. QR, SC

**ASTR 355a, Observational Astronomy** Robert Zinn

Optics for astronomers. Design and use of optical telescopes, photometers, spectrographs, and detectors for astronomical observations. Introduction to error analysis, concepts of signal-to-noise, and the reduction and analysis of photometric and spectroscopic observations. Prerequisite: one astronomy course numbered above 200, or permission of instructor. Previous experience with computer programming recommended. QR, SC RP

**ASTR 360a, Interstellar Matter and Star Formation** Hector Arce

The composition, extent, temperature, and density structure of the interstellar medium (ISM). Excitation and radiative processes; the properties of dust; the cold and hot ISM in the Milky Way and other galaxies. Dynamics and evolution of the ISM, including interactions between stars and interstellar matter. Physics and chemistry of molecular clouds and the process of star formation. Prerequisites: MATH 120 and PHYS 201 or equivalents. Taught in alternate years. QR, SC RP

[ ASTR 375, Exoplanets ]

[ ASTR 380, Stellar Populations ]

**ASTR 385b, Introduction to Radio Astronomy** Michael Faison

Introduction to the theory and techniques of radio astronomy, including radio emission mechanisms, propagation effects, antenna theory, interferometry, and spectroscopy. Discussion of specific sources such as Jupiter, radio stars, molecular clouds, radio galaxies, ETI, and the microwave background. Includes observational exercises with a small radio telescope. Prerequisites: MATH 120 and PHYS 201 or equivalents. QR, SC

[ ASTR 418, Stellar Dynamics ]

**ASTR 420a, Computational Methods for Astrophysics** Paolo Coppi

The analytic, numerical, and computational tools necessary for effective research in astrophysics and related disciplines. Topics include numerical solutions to differential equations, spectral methods, and Monte Carlo simulations. Applications to common astrophysical problems including fluids and N-body simulations. Prerequisites: ASTR 320, MATH 120, 222 or 225, and 246. QR RP

**ASTR 450b, Stellar Astrophysics** Sarbani Basu

The physics of stellar atmospheres and interiors. Topics include the basic equations of stellar structure, nuclear processes, stellar evolution, white dwarfs, and neutron stars. Prerequisites: PHYS 201 and MATH 120. Taught in alternate years. QR, SC



\* **ASTR 490a and ASTR 491b, Independent Project in Astronomy** Debra Fischer  
Independent project supervised by a member of the department with whom the student meets regularly. The project must be approved by the instructor and by the director of undergraduate studies; the student is required to submit a complete written report on the project at the end of the term.

## Biology

Yale offers three different biological sciences majors, including Ecology and Evolutionary Biology (EEB), Molecular Biophysics and Biochemistry (MB&B), and Molecular, Cellular, and Developmental Biology (MCDB). The distinctions between these majors reflect the types of biological systems analysis each represents: the analysis of whole organisms, populations, and ecosystems (EEB); use of the tools of chemistry and physics to study life at the molecular level (MB&B); and molecular, cellular, and developmental biology, genetics, and neurobiology (MCDB). These approaches cover the vast breadth of disciplines in the biological sciences.

The courses BIOL 101–104 are designed as entry points to all three programs in the biological sciences. The prerequisites for the three majors are similar, so students need not commit to a specific major in the freshman year.

For information on the major requirements, course offerings, and departmental faculty of the biological sciences programs, see under Ecology and Evolutionary Biology (p. 239), Molecular Biophysics and Biochemistry (p. 514), and Molecular, Cellular, and Developmental Biology (p. 521).

Students in the Class of 2015 may fulfill the requirements of the combined Biology major that were in place when they entered the major, as described in previous editions of this bulletin (<http://www.yale.edu/printer/bulletin/archivepdf/files/YCPS>). Alternatively, they may fulfill the requirements of the major in Ecology and Evolutionary Biology (p. 239), Molecular Biophysics and Biochemistry (p. 514), or Molecular, Cellular, and Developmental Biology (p. 521).

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## Courses

### **BIOL 101a or b, Biochemistry and Biophysics** Staff

Introduction to the study of life at the molecular level. Topics include the three-dimensional structures and function of large biological molecules, the human genome, and the design of antiviral drugs to treat HIV/AIDS. The first of four modules in a yearlong introductory biology sequence; meets for the first half of the term. SC ½ Course cr

### **BIOL 102a or b, Principles of Cell Biology and Membrane Physiology** Staff

Introduction to the study of cell biology and membrane physiology. Topics include organization and functional properties of biological membranes, membrane physiology and signaling, rough endoplasmic reticulum and synthesis of membrane/secretory membrane proteins, endocytosis, the cytoskeleton, and cell division. The second of four modules in a yearlong introductory biology sequence; meets for the second half of the term. SC ½ Course cr

**\* BIOL 103a or b, Genes and Development** Staff

Introduction to genes, genetics, and developmental biology. How genes control development and disease; Mendel's rules; examples of organ physiology. The third of four modules in a yearlong introductory biology sequence; meets for the first half of the term. SC ½ Course cr

**BIOL 104a or b, Principles of Ecology and Evolutionary Biology** Staff

Introduction to ecology, evolutionary biology, animal behavior, and the history of life. Evolutionary transitions and natural selection. Adaptation at genic, chromosomal, cellular, organismal, and supra-organismal levels. Distributional and social consequences of particular suites of organismal adaptations. The fourth of four modules in a yearlong introductory biology sequence; meets for the second half of the term. WR, SC ½ Course cr

## Biomedical Engineering

Director of undergraduate studies: James Duncan, N309 D TAC, 785-2427, 313 MEC, 432-9917, james.duncan@yale.edu; seas.yale.edu/departments/biomedical-engineering

### FACULTY OF THE DEPARTMENT OF BIOMEDICAL ENGINEERING

**Professors** Richard Carson, R. Todd Constable, James Duncan, Jay Humphrey, Fahmeed Hyder, Andre Levchenko, † Laura Niklason, Douglas Rothman, Mark Saltzman, † Frederick Sigworth, † Brian Smith, † Hemant Tagare, † Paul Van Tassel, † Corey Wilson, Steven Zucker

**Associate Professors** † Robin de Graaf, Tarek Fahmy, Themis Kyriakides, Michael Levene, † Evan Morris, † Xenophon Papademetris, Lawrence Staib

**Assistant Professors** † Joerg Bewersdorf, Stuart Campbell, † Michael Choma, Rong Fan, Anjelica Gonzalez, † Chi Liu, Kathryn Miller-Jensen, † Jianbing Zhou

**Lecturers** † Liqiong Gui, † Jing Zhou

† A joint appointment with primary affiliation in another department or school.

Engineering methods and strategies are used to address important biomedical problems ranging from studies of physiological function using images to the development of artificial organs and new biomaterials. The major in Biomedical Engineering is designed to provide students with an understanding of the common methodologies that underlie many of these problems as well as the ability to develop quantitative approaches to understanding one of three biomedical engineering fields in more detail.

The flexible course structure of the major permits students to understand and bridge basic concepts in the life sciences and traditional areas of engineering, while also gaining a comprehensive understanding of biomedical engineering as a field of study.

**Requirements of the major** The B.S. degree program in Biomedical Engineering offers three tracks: the bioimaging track, the biomechanics track, and the molecular engineering track.

During the freshman year, students study basic mathematics, chemistry, and biology. By the end of the sophomore year, they have taken physics, ENAS 194, Ordinary and Partial Differential Equations with Applications, BENG 249, Introduction to

Biomedical Computation, and BENG 350, Physiological Systems. In the junior year, students obtain a comprehensive grounding in the field through taking BENG 351, Biotransport and Kinetics, 352, Biomedical Signals and Images, 353, Introduction to Biomechanics, 355L, Physiological Systems Laboratory, and 356L, Biomedical Engineering Laboratory. They also take an elective in one of the three areas of concentration in order to prepare for more advanced work. During the remainder of the junior and senior years, students acquire depth in one of the three areas of concentration. A senior seminar and a senior project permit students to gain practical, detailed information about their chosen area of concentration.

The following courses are prerequisite to the major for students in all tracks: BIOL 101 and 102 (or a higher-level course in MCDB or MB&B, with permission of the director of undergraduate studies); CHEM 112, 114, or 118; ENAS 194; MATH 115; MATH 120 or ENAS 151; PHYS 180, 181, 205L, and 206L (or 165L and 166L, with permission of the director of undergraduate studies).

Students must complete twelve term courses, totaling at least eleven course credits, beyond the prerequisites, including at least three required courses in the chosen track, two terms of a biomedical engineering laboratory (BENG 355L, 356L), and the two-term senior requirement.

Students in all tracks are required to take the following seven term courses: BENG 249, 350, 351, 352, 353, 355L, and 356L. Students in the *bioimaging track* must also take three courses chosen from EENG 310, BENG 410, 421, 436, 445, 475, 476, or 485. Students in the *biomechanics track* must also take three courses chosen from MENG 185, 280, 361, BENG 410, 434, 453, 455, 457, or 458. Students in the *molecular engineering track* must also take three courses chosen from BENG 410, 434, 435, 464, 465, 467, MENG 361, or MB&B 300. Any relevant course may be substituted with the permission of the director of undergraduate studies. By the end of senior year, two term courses in the life sciences must have been included among the prerequisite and required courses for the major.

**Senior requirement** In their senior year, all students must complete a one-term senior project in their final term of enrollment (BENG 471 or 472) and the senior seminar (BENG 480).

**Credit/D/Fail** No course taken Credit/D/Fail may count toward the major, including prerequisites.

**Preparation for graduate study** The Biomedical Engineering curriculum is excellent preparation for graduate study in engineering, science, and medicine. In some cases, organic chemistry and/or certain biology courses may be substituted for courses in any one of the tracks after consultation with the director of undergraduate studies.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** BIOL 101 and 102, or higher-level course in MCDB or MB&B with DUS permission; CHEM 112, 114, or 118; ENAS 194; MATH 115; MATH 120 or ENAS 151; PHYS 180, 181, and 205L, 206L (or 165L, 166L with DUS permission)

**Number of courses** 12 term courses, totaling at least 11 course credits, beyond prereqs (incl senior req)

**Specific courses required** *All tracks*—BENG 249, 350, 351, 352, 353, 355L, 356L;  
*Bioimaging track*—3 from EENG 310, BENG 410, 421, 436, 445, 475, 476, or 485;

*Biomechanics track*—3 from MENG 185, 280, 361, BENG 410, 434, 453, 455, 457, or 458; *Molecular engineering track*—3 from BENG 410, 434, 435, 464, 465, 467, MENG 361, or MB&B 300

**Distribution of courses** 2 term courses in life sciences among prereq and req courses

**Substitution permitted** Relevant course with DUS permission

**Senior requirement** Senior project in final term (BENG 471 or 472) and senior sem (BENG 480)

## Courses

### **BENG 100b, Frontiers of Biomedical Engineering** Mark Saltzman

The basic concepts of biomedical engineering and their connection with the spectrum of human activity. Introduction to the fundamental science and engineering on which biomedical engineering is based. Topics include genetic engineering, cell culture engineering, vaccines, drug discovery and delivery, cardiovascular physiology, biomechanics, and biomedical imaging. Designed for science and non-science majors. SC

### **BENG 249b, Introduction to Biomedical Computation** Richard Carson

Computational and mathematical tools used in biomedical engineering for the simulation of biological systems and the analysis of biomedical data. Basics of computational programming in MATLAB; applications to modeling, design, and statistical and data analysis. Prerequisite: MATH 120 or ENAS 151. QR

### \* **BENG 350a / MCDB 310a, Physiological Systems** Stuart Campbell

Regulation and control in biological systems, emphasizing human physiology and principles of feedback. Biomechanical properties of tissues emphasizing the structural basis of physiological control. Conversion of chemical energy into work in light of metabolic control and temperature regulation. Prerequisites: CHEM 113 or 115, or PHYS 180 and 181; MCDB 120, or BIOL 101 and 102. SC

### **BENG 351a / CENG 351a, Biotransport and Kinetics** Kathryn Miller-Jensen

Creation and critical analysis of models of biological transport and reaction processes. Topics include mass and heat transport, biochemical interactions and reactions, and thermodynamics. Examples from diverse applications, including drug delivery, biomedical imaging, and tissue engineering. Prerequisites: PHYS 180, 181, MATH 115, ENAS 194; MCDB 120, or BIOL 101 and 102; CHEM 112, 114, or 118. QR

### **BENG 352b, Biomedical Signals and Images** James Duncan

Principles and methods used to represent, model, and process signals and images arising from biomedical sources. Topics include continuous and discrete linear systems analysis, Fourier analysis and frequency response, metrics for signal similarity, and noise filtering. Biomedical examples range from one-dimensional electrical signals in nerves and muscles to two-dimensional images of organs and cells. Prerequisite: MATH 120 or ENAS 151. BENG 249, 350, and ENAS 194 strongly recommended. QR

### **BENG 353b, Introduction to Biomechanics** Jay Humphrey

An introduction to the biomechanics used in biosolid mechanics, biofluid mechanics, biothermomechanics, and biochemomechanics. Diverse aspects of biomedical engineering, from basic mechanobiology to the design of novel biomaterials, medical

devices, and surgical interventions. Prerequisites: PHYS 180, 181, MATH 115, and ENAS 194. QR

**\* BENG 355La, Physiological Systems Laboratory** Rong Fan

Introduction to laboratory techniques and tools used in biomedical engineering for physiological measurement. Topics include bioelectric measurement, signal processing, and dialysis. Enrollment limited to majors in Biomedical Engineering, except by permission of the director of undergraduate studies. SC ½ Course cr

**\* BENG 356Lb, Biomedical Engineering Laboratory** Staff

Continuation of BENG 355L, introducing laboratory techniques and tools used in biomedical engineering. Topics include image processing, ultrasound, and microscopy. Enrollment limited. SC ½ Course cr

**BENG 404a / MENG 404a, Medical Device Design and Innovation** Joseph Zinter

The engineering design, project planning, prototype creation, and fabrication processes for medical devices that improve patient conditions, experiences, and outcomes. Students develop viable solutions and professional-level working prototypes to address clinical needs identified by practicing physicians. Some attention to topics such as intellectual property, the history of medical devices, documentation and reporting, and regulatory affairs.

**\* BENG 405b / EVST 415b, Biotechnology and the Developing World**

Anjelica Gonzalez

Study of technological advances that have global health applications. Ways in which biotechnology has enhanced quality of life in the developing world. The challenges of implementing relevant technologies in resource-limited environments, including technical, practical, social, and ethical aspects. Prerequisite: MCDB 120, or BIOL 101 and 102.

**\* BENG 410a, Physical and Chemical Basis of Bioimaging and Biosensing**

Douglas Rothman

Basic principles and technologies for sensing the chemical, electrical, and structural properties of living tissues and of biological macromolecules. Topics include magnetic resonance spectroscopy, microelectrodes, fluorescent probes, chip-based biosensors, X-ray and electron tomography, and MRI. Prerequisites: BENG 351 and 352 or permission of instructor. QR, SC

**BENG 411b, Biomedical Microtechnology and Nanotechnology** Rong Fan

Principles and applications of micro- and nanotechnologies for biomedicine. Approaches to fabricating micro- and nanostructures. Fluid mechanics, electrokinetics, and molecular transport in microfluidic systems. Integrated biosensors and microTAS for laboratory medicine and point-of-care uses. High-content technologies, including DNA, protein microarrays, and cell-based assays for differential diagnosis and disease stratification. Emerging nanobiotechnology for systems medicine. Prerequisites: CHEM 112, 114, or 118, and ENAS 194. SC

**\* BENG 421b, Fundamentals of Medical Imaging** Robert Constable

The physics of image formation, with special emphasis on techniques with medical applications. Emphasis on concepts common to different types of imaging, along with understanding how information is limited by physical phenomena. Topics include mathematical concepts of image analysis, formation of images by ionizing radiation, ultrasound, NMR and other energy forms, and methods of evaluating image quality.

Prerequisites: ENAS 194, and PHYS 180, 181, or 200, 201, or permission of instructor.  
QR, SC

**BENG 434a, Biomaterials** Anjelica Gonzalez

Introduction to the major classes of biomedical materials: ceramics, metals, and polymers. Their structure, properties, and fabrication connected to biological applications, from implants to tissue-engineered devices and drug delivery systems. Prerequisite: CHEM 113 or 115; organic chemistry recommended. SC

\* **BENG 435b, Biomaterial-Tissue Interactions** Themis Kyriakides

Study of the interactions between tissues and biomaterials, with an emphasis on the importance of molecular- and cellular-level events in dictating the performance and longevity of clinically relevant devices. Attention to specific areas such as biomaterials for tissue engineering and the importance of stem/progenitor cells, as well as biomaterial-mediated gene and drug delivery. Prerequisites: CHEM 112, 114, or 118; MCDB 120, or BIOL 101 and 102; or equivalents. SC

**BENG 445a / EENG 445a, Biomedical Image Processing and Analysis** James Duncan

A study of the basic computational principles related to processing and analysis of biomedical images (e.g., magnetic resonance, computed X-ray tomography, fluorescence microscopy). Basic concepts and techniques related to discrete image representation, multidimensional frequency transforms, image enhancement, motion analysis, image segmentation, and image registration. Prerequisite: BENG 352 or EENG 310 or permission of instructors. Recommended preparation: familiarity with probability theory.

**BENG 453a, Continuum Biomechanics** Jay Humphrey

Advanced state-of-the-art methods of continuum and computational biomechanics. New theories of soft tissue growth, remodeling, disease progression, healing, and aging. Emphasis on mechanics driven by advances in vascular mechanobiology. Prerequisite: BENG 353. QR

**BENG 458b, Multiscale Models of Biomechanical Systems** Stuart Campbell

Current methods for simulating biomechanical function across biological scales, from molecules to organ systems of the human body. Theory and numerical methods; case studies exploring recent advances in multiscale biomechanical modeling. Includes computer laboratory sessions that introduce relevant software packages. Prerequisites: BENG 249, 351, and 353, or permission of instructor. QR

**BENG 463a / CENG 320a, Immunoengineering** Tarek Fahmy

Introduction to immunoengineering, a field combining immunology with the physical sciences and engineering. Focus on biophysical principles and biomaterial applications for understanding and engineering immunity. SC

**BENG 464b, Tissue Engineering** Laura Niklason

Introduction to the major aspects of tissue engineering, including materials selection, scaffold fabrication, cell sources, cell seeding, bioreactor design, and tissue characterization. Class sessions include lectures and hands-on laboratory work. Prerequisite: CHEM 112, 114, or 118. Recommended preparation: organic chemistry, cell biology, and physiology. SC 1½ Course cr

**BENG 466a, Engineering of Drug Delivery** Mark Saltzman

Approaches and technologies for getting pharmaceutical agents into particular cells and tissues in the body for a biological effect, while minimizing unwanted toxic or side effects. Mathematical descriptions of the biological barriers to drug delivery, such as diffusion, permeation through membranes, and lifetime of circulation; engineering design to improve drug delivery. Prerequisites: ENAS 194 and BENG 351 or equivalents.  
SC

**BENG 467b, Systems Biology of Cell Signaling** Andre Levchenko

Approaches from systems biology to the fundamental processes underlying both the sensory capability of individual cells and cell-to-cell communication in health and disease. Prerequisites: BENG 249 and ENAS 194, or equivalents. QR, SC

**\* BENG 471a and BENG 472b, Special Projects** James Duncan

Faculty-supervised individual or small-group projects with emphasis on research (laboratory or theory), engineering design, or tutorial study. Students are expected to consult the director of undergraduate studies and appropriate faculty members about ideas and suggestions for suitable topics. This course is usually taken during the spring term of the senior year but with permission of the director of undergraduate studies can be taken any time during a student's career, and may be taken more than once. Permission of both the instructor and the director of undergraduate studies is required.

**BENG 475a / CPSC 475a, Computational Vision and Biological Perception**

Steven Zucker

An overview of computational vision with a biological emphasis. Suitable as an introduction to biological perception for computer science and engineering students, as well as an introduction to computational vision for mathematics, psychology, and physiology students. After CPSC 112 and MATH 120, or with permission of instructor.  
QR, SC RP

**BENG 476b / CPSC 476b, Advanced Computational Vision** Steven Zucker

Advanced view of vision from a mathematical, computational, and neurophysiological perspective. Emphasis on differential geometry, machine learning, visual psychophysics, and advanced neurophysiology. Topics include perceptual organization, shading, color and texture analysis, and shape description and representation. After CPSC 475. QR, SC

**\* BENG 480a, Seminar in Biomedical Engineering** Xenophon Papademetris

Oral presentations and written reports by students analyzing papers from scientific journals on topics of interest in biomedical engineering, including discussions and advanced seminars from faculty on selected subjects.

**\* BENG 485b, Fundamentals of Neuroimaging** Fahmeed Hyder

The neuroenergetic and neurochemical basis of several dominant neuroimaging methods, including fMRI. Technical aspects of different methods, interpretation of results, and controversies or challenges regarding the application of fMRI and related methods in medicine. SC

## British Studies

(Courses at the Paul Mellon Centre in London)

During the spring term, the Yale-in-London program at the Paul Mellon Centre for Studies in British Art, located in central London, offers four courses in British studies covering British history, history of art or architecture, literature, and drama. Students take all four courses offered, and courses taught at the Paul Mellon Centre must be taken for a letter grade. Further information is available on the program's Web site (<http://britishart.yale.edu/education/yale-college-students/yale-in-london>). Inquiries may also be directed to [yaleinlondon@yale.edu](mailto:yaleinlondon@yale.edu). The application deadline for spring term 2015 is Friday, October 3, 2014. Students will be notified of acceptance within one month of the application deadline. Inquiries about the summer program, described in the Undergraduate Curriculum section (p. 23), should be directed to the same address. Applications for summer 2015 are due Monday, February 2, 2015.

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## Courses

### **BRST 173b, Society and Culture in London, 1560-1760** Keith Wrightson

The transformation of London from a modest city of 50,000 inhabitants to the metropolitan hub of an expanding British empire and a center of world trade. Focus on the development of a distinctive urban society and culture. HU

### \* **BRST 193b, Victorian Photography** Staff

The technological and aesthetic development of photography in nineteenth-century Britain. Photography as art or science; photography's relationship with the visual arts, journalism, social and political campaigns, travel, tourism, and empire; debates about materialism and spiritualism; the figure of the photographer and of the photographic collector. HU

### \* **BRST 196b, Time and Place in Early Modern England** Keith Wrightson

Perceptions of time and place in England and their relationships to personal and social identity, c. 1500 to 1800. Cartography, chorography, antiquarianism, conventions of timekeeping, perceptions of the life course, the creation of social memory and historical narratives, representations of social place, the effects of the Reformation, iconic places, and perceptions of previously unknown places and peoples. Use of visual and textual primary sources. none HU

### \* **BRST 478b, Modern British Drama** Sheila Fox

A detailed study of representative works of modern British drama, based on current productions on the London stage. Theatrical conventions developed by playwrights and actors in the theater of postwar Britain, both on the fringe and in the mainstream of the West End. Attention to social issues addressed by the plays. HU

## Chemical Engineering

Director of undergraduate studies: Michael Loewenberg, 303 ML, 432-4334, [michael.loewenberg@yale.edu](mailto:michael.loewenberg@yale.edu); [seas.yale.edu/departments/chemical-and-environmental-engineering](http://seas.yale.edu/departments/chemical-and-environmental-engineering)

FACULTY OF THE DEPARTMENT OF CHEMICAL AND ENVIRONMENTAL ENGINEERING

**Professors** Eric Altman, † Michelle Bell, † Gaboury Benoit, † Stephen Edberg, Menachem Elimelech, Abbas Firoozabadi (*Adjunct*), † Thomas Graedel, Gary Haller,



† Edward Kaplan, Yehia Khalil (*Adjunct*), Michael Loewenberg, Robert McGraw (*Adjunct*), Lisa Pfefferle, Joseph Pignatello (*Adjunct*), Daniel Rosner, † James Saiers, † Mark Saltzman, † Udo Schwarz, T. Kyle Vanderlick, Paul Van Tassel, Corey Wilson, † Kurt Zilm

**Associate Professors** † Eric Dufresne, † Tarek Fahmy, Chinedum Osuji, Jordan Peccia, † Julie Zimmerman

**Assistant Professor** André Taylor

† A joint appointment with primary affiliation in another department or school.

Energy, the environment, and health care are key challenges facing humanity in the twenty-first century. Chemical engineering is a discipline well placed to confront these challenges. Chemical engineering is rooted in the basic sciences of mathematics, chemistry, physics, and biology; a traditional engineering science core of thermodynamics, transport phenomena, and chemical kinetics; a rigorous design component; and an expanding focus on emerging topics in materials, nanotechnology, and life sciences. The discipline has grown from its petrochemical origins to become central to state-of-the-art technologies in microelectronics, alternative energy, biomedicine, and pharmaceuticals.

The Chemical Engineering program is principally focused on basic and engineering sciences and on problem solving. Additional emphasis is on communication, analysis of experiments, and chemical process design. A special feature of the program is the accessibility of laboratory research—most Chemical Engineering majors participate in faculty-led research projects, often resulting in publication and/or presentation at national meetings.

Chemical Engineering graduates find a wide range of professional opportunities in academia, industry, government, business, and the nonprofit sector. Many majors go on to graduate programs in chemical, biomedical, or environmental engineering or to medical, law, or business schools.

The educational objectives of the Chemical Engineering program are the following. Graduating students will achieve positions of leadership within academia, industry, and government; excel in top graduate programs in chemical, biomedical, environmental, and related engineering fields; excel in top professional schools in fields such as law, medicine, or management; join and rise in the ranks of large and small corporations; become successful entrepreneurs; practice engineering toward the benefit of humankind.

Students considering a chemical engineering major are encouraged to take two terms of chemistry and mathematics during the freshman year, and to contact the director of undergraduate studies.

**Requirements of the major** Two degree programs are offered: a B.S. in Chemical Engineering accredited by the Engineering Accreditation Commission of ABET, Inc., and a B.S. in Engineering Sciences (Chemical).

**Prerequisites** Students in both degree programs take the following prerequisite courses: MATH 112, 115, and ENAS 151 or equivalent; PHYS 180, 181; CHEM 114, 115,

and 116L, or CHEM 118; ENAS 130. Students with advanced high school preparation may reduce the number of prerequisites.

**B.S. degree program in Chemical Engineering** The curriculum for the ABET-accredited B.S. degree in Chemical Engineering includes the following required courses beyond the prerequisites:

1. Mathematics: ENAS 194 or equivalent
2. Chemistry: CHEM 124 and 125, or CHEM 220 and either 221 or 230; CHEM 332, 333, and 330L
3. Engineering science: MENG 361 and three term courses chosen from engineering electives
4. Chemical engineering: CENG 210, 300, 301, 315, 411, 412, 480

**Senior requirement** In their senior year students must pass CENG 416, Chemical Engineering Process Design.

**B.S. degree program in Engineering Sciences (Chemical)** The B.S. degree in Engineering Sciences (Chemical) requires ten term courses beyond the prerequisites, chosen in consultation with the director of undergraduate studies. The standard program includes the following courses:

1. Mathematics: ENAS 194 or equivalent
2. Chemistry: CHEM 124 and 125, or CHEM 220 and either 221 or 230, or CHEM 332 and 333
3. Engineering science: MENG 361
4. Chemical engineering: CENG 210, 300, 301, 315, 411

**Senior requirements** In their senior year students must complete a senior research project in CENG 490.

## REQUIREMENTS OF THE MAJOR

### CHEMICAL ENGINEERING, B.S.

**Prerequisites** MATH 112, 115, ENAS 151 or equivalent; CHEM 114, 115, and 116L, or CHEM 118; PHYS 180, 181; ENAS 130

**Number of courses** 18 term courses beyond prereqs (incl senior req)

**Specific courses required** ENAS 194 or equivalent; CHEM 124 and 125, or CHEM 220 and either 221 or 230; CHEM 332, 333, and 330L; MENG 361; CENG 210, 300, 301, 315, 411, 412, 480

**Distribution of courses** 3 addtl electives in engineering

**Senior requirement** CENG 416

### ENGINEERING SCIENCES (CHEMICAL), B.S.

**Prerequisites** MATH 112, 115, ENAS 151 or equivalent; CHEM 114, 115, and 116L, or CHEM 118; PHYS 180, 181; ENAS 130

**Number of courses** 10 term courses beyond prereqs (incl senior req)

**Specific courses required** ENAS 194 or equivalent; CHEM 124 and 125, or CHEM 220 and either 221 or 230, or CHEM 332 and 333; MENG 361; CENG 210, 300, 301, 315, 411

**Senior requirement** CENG 490

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\* **CENG 120b / ENAS 120b / ENVE 120b, Introduction to Environmental Engineering**

Julie Zimmerman

Introduction to engineering principles related to the environment, with emphasis on causes of problems and technologies for abatement. Topics include air and water pollution, global climate change, hazardous chemical and emerging environmental technologies. Prerequisites: high school calculus and chemistry or CHEM 114, 115 (may be taken concurrently) or permission of instructor. QR, SC

**CENG 210a / ENVE 210a, Principles of Chemical Engineering and Process Modeling**

Lisa Pfefferle

Analysis of the transport and reactions of chemical species as applied to problems in chemical, biochemical, and environmental systems. Emphasis on the interpretation of laboratory experiments, mathematical modeling, and dimensional analysis. Lectures include classroom demonstrations. Prerequisite: MATH 120 or permission of instructor. QR, SC RP

**CENG 300b, Chemical Engineering Thermodynamics**

Paul Van Tassel and Alessandro Gomez

Analysis of equilibrium systems. Topics include energy conservation, entropy, heat engines, Legendre transforms, derived thermodynamic potentials and equilibrium criteria, multicomponent systems, chemical reaction and phase equilibria, systematic derivation of thermodynamic identities, criteria for thermodynamic stability, and introduction to statistical thermodynamics. Prerequisite: MATH 120 or ENAS 151 or permission of instructor. QR, SC RP

**CENG 301b, Chemical Kinetics and Chemical Reactors** Chinedum Osuji

Physical-chemical principles and mathematical modeling of chemical reactors. Topics include homogeneous and heterogeneous reaction kinetics, catalytic reactions, systems of coupled reactions, selectivity and yield, chemical reactions with coupled mass transport, nonisothermal systems, and reactor design. Applications from problems in environmental, biomedical, and materials engineering. Prerequisite: ENAS 194 or permission of instructor. QR, SC RP

**CENG 315b / ENVE 315b, Transport Phenomena** Chinedum Osuji

Unified treatment of momentum, energy, and chemical species transport including conservation laws, flux relations, and boundary conditions. Topics include convective and diffusive transport, transport with homogeneous and heterogeneous chemical reactions and/or phase change, and interfacial transport phenomena. Emphasis on problem analysis and mathematical modeling, including problem formulation, scaling arguments, analytical methods, approximation techniques, and numerical solutions. Prerequisite: ENAS 194 or permission of instructor. QR, SC RP

**CENG 320a / BENG 463a, Immunoengineering** Tarek Fahmy

Introduction to immunoengineering, a field combining immunology with the physical sciences and engineering. Focus on biophysical principles and biomaterial applications for understanding and engineering immunity. SC

**CENG 351a / BENG 351a, Biotransport and Kinetics** Kathryn Miller-Jensen

Creation and critical analysis of models of biological transport and reaction processes. Topics include mass and heat transport, biochemical interactions and reactions, and thermodynamics. Examples from diverse applications, including drug delivery,

biomedical imaging, and tissue engineering. Prerequisites: PHYS 180, 181, MATH 115, ENAS 194; MCDB 120, or BIOL 101 and 102; CHEM 112, 114, or 118. QR

**\* CENG 373a / ENVE 373a, Air Pollution Control** Drew Gentner

Kinetics, thermodynamics, and transport of chemical reactions of common air pollutants including suspended particulate matter. The role of surface chemistry and transport phenomena in air pollution. Pollutant dispersion modeling. Technology available to prevent or control air pollutants. Prerequisite: ENVE 210 or permission of instructor. QR, SC RP

**\* CENG 377a / ENVE 377a, Water Quality Control** Jordan Peccia

Study of the preparation of water for domestic and other uses and treatment of wastewater for recycling or discharge to the environment. Topics include processes for removal of organics and inorganics, regulation of dissolved oxygen, and techniques such as ion exchange, electro dialysis, reverse osmosis, activated carbon adsorption, and biological methods. Prerequisite: ENVE 120 or permission of instructor. SC RP

**CENG 411a, Separation and Purification Processes** Chinedum Osuji

Theory and design of separation processes for multicomponent and/or multiphase mixtures via equilibrium and rate phenomena. Topics include single-stage and cascaded absorption, adsorption, extraction, distillation, partial condensation, filtration, and crystallization processes. Applications to environmental engineering (air and water pollution control), biomedical-chemical engineering (artificial organs, drug purification), food processing, and semiconductor processing. Prerequisite: CENG 300 or 315 or permission of instructor. QR, SC RP

**CENG 412b, Chemical Engineering Laboratory and Design** Eric Altman

An introduction to design as practiced by chemical and environmental engineers. Engineering fundamentals, laboratory experiments, and design principles are applied toward a contemporary chemical process challenge. Sustainability and economic considerations are emphasized. SC

**CENG 416b / ENVE 416b, Chemical Engineering Process Design**

Paul Van Tassel and Desiree Plata

Study of the techniques for and the design of chemical processes and plants, applying the principles of chemical engineering and economics. Emphasis on flowsheet development and equipment selection, cost estimation and economic analysis, design strategy and optimization, safety and hazards analysis, and environmental and ethical considerations. Prerequisites: CENG 301 and 411. QR, SC RP

**CENG 471a or b, Independent Research** Michael Loewenberg

Faculty-supervised individual student research and design projects. Emphasis on the integration of mathematics with basic and engineering sciences in the solution of a theoretical, experimental, and/or design problem. May be taken more than once for credit.

**CENG 480a, Chemical Engineering Process Control** Michael Loewenberg

Transient regime modeling and simulations of chemical processes. Conventional and state-space methods of analysis and control design. Applications of modern control methods in chemical engineering. Course work includes a design project. Prerequisite: ENAS 194 or permission of instructor. QR, SC RP

**\* CENG 490a or b, Senior Research Project** Michael Loewenberg

Individual research and/or design project supervised by a faculty member in Chemical Engineering, or in a related field with permission of the director of undergraduate studies.

**RELATED COURSE THAT COUNTS TOWARD THE MAJOR**

**MENG 361a, Mechanical Engineering II: Fluid Mechanics** Mitchell Smooke  
Mechanical properties of fluids, kinematics, Navier-Stokes equations, boundary conditions, hydrostatics, Euler's equations, Bernoulli's equation and applications, momentum theorems and control volume analysis, dimensional analysis and similitude, pipe flow, turbulence, concepts from boundary layer theory, elements of potential flow.  
Prerequisites: ENAS 194 or equivalent, and physics at least at the level of PHYS 180.

QR, SC RP

## Chemistry

Director of undergraduate studies: Patrick Vaccaro, 240 SCL, 432-3975,  
patrick.vaccaro@yale.edu [F]; Kurt Zilm, 119 SCL, 432-3956, kurt.zilm@yale.edu [Sp];  
www.chem.yale.edu

**FACULTY OF THE DEPARTMENT OF CHEMISTRY**

**Professors** † Sidney Altman, Victor Batista, Gary Brudvig, Robert Crabtree, † Craig Crews, R. James Cross, Jr. (*Emeritus*), Jonathan Ellman, John Faller (*Emeritus*), † Gary Haller, Seth Herzon, Patrick Holland, † Francesco Iachello, Mark Johnson, William Jorgensen, J. Patrick Loria, James Mayer, J. Michael McBride (*Emeritus*), Scott Miller, Peter Moore (*Emeritus*), † Anna Pyle, † Lynne Regan, † James Rothman, Martin Saunders, Alanna Schepartz, Charles Schmuttenmaer, † Dieter Söll, David Spiegel, † Thomas Steitz, † Scott Strobel, John Tully, Patrick Vaccaro, Elsa Yan, Frederick Ziegler (*Emeritus*), Kurt Zilm

**Associate Professor** Nilay Hazari

**Assistant Professors** Richard Baxter, Jason Crawford, Ziad Ganim, Timothy Newhouse, Sarah Slavoff, Hailiang Wang

**Lecturers** Paul Anastas, Christine DiMeglio, N. Ganapathi, Jonathan Parr

† A joint appointment with primary affiliation in another department.

The wide range of courses offered by the Department of Chemistry reflects the position of chemistry as the foundation of all the molecular sciences. In addition to graduate work in chemistry, biochemistry, or health-related disciplines, the department's graduates find their broad scientific training useful in fields such as technology policy, business management, and law. Chemistry is an especially appropriate major for students interested in energy research or policy and the environment.

**Courses for nonmajors without prerequisites** The Chemistry department offers one-term courses with no prerequisites, which are intended for non-science majors. These courses do not satisfy medical school requirements or the general chemistry requirement for any science major. The offering for 2014–2015 is CHEM 101, Chemistry in the Modern World.

**Introductory courses and placement** The majority of students begin with a general chemistry sequence: either CHEM 112 and 113, Chemistry with Problem Solving I and II; CHEM 114 and 115, Comprehensive General Chemistry I and II; or CHEM 118, Quantitative Foundations of General Chemistry. Any of these courses fulfills the prerequisite for general chemistry in the Chemistry major. A typical student in CHEM 112 may have taken a year of high school chemistry, but has not been exposed to the problem-solving approach used in many university-level science courses. Students in CHEM 114 may have taken one or possibly two years of chemistry in high school and have had some exposure to quantitative problem-solving scientific methods. A little more than half of the students in CHEM 114 last took chemistry as sophomores in high school. Students who have done well in an advanced placement chemistry course or shown other evidence of high achievement in science and mathematics may start in CHEM 115 or 118. For instance, students with a Chemistry Advanced Placement test score of 5 may elect either CHEM 115 or 118.

Students with a sufficiently strong background in chemistry may initiate their studies with courses in organic or physical chemistry after demonstrating proficiency on the department's placement examination. CHEM 124 and 125, Freshman Organic Chemistry I and II, are offered expressly for freshmen. Other courses in organic chemistry, including CHEM 220, 221, and 230, also are available to qualified freshmen. Students with a strong background in physics and calculus may be eligible for the physical chemistry courses CHEM 332 and 333.

**Placement procedures** The Chemistry department reviews the preparation of all freshmen prior to the beginning of the fall term, using test scores, admission records, and information supplied by students. Incoming students should see the Freshman Web site (<http://yalecollege.yale.edu/content/chemistry-1>) for details on information to submit during the summer before matriculation. The department determines the appropriate general chemistry course for every entering freshman, either CHEM 112, 114, 115, or 118. Students will be able to view their initial placement in late August on the "Chem Placement 2014" site on Classes\*v2 (<https://classesv2.yale.edu/portal/>); instructions are available on the Freshman Web site (<http://yalecollege.yale.edu/new-students/transfer-students/general-academic-information/special-programs-placement-and-o>).

Freshmen wishing to take CHEM 124, 220, or 332, or those wishing to take a higher-level course than their initially assigned placement, are required to take a placement examination on the first day of registration week in the fall term. Students who feel they have been placed incorrectly at too high a level may discuss changing their placement with a chemistry placement adviser and do not need to take the examination. Students uncertain about their placement are encouraged to sit for the examination, as it provides the best measure of a student's readiness to enter the wide variety of courses offered to freshmen.

Students with placement questions, or those wishing to change their course preference indicated during preregistration, should attend the department's orientation meeting prior to the placement examination. Additional sessions with placement advisers are scheduled throughout the first week of the fall term in 183 SCL at times listed in the *Calendar for the Opening Days of College*. Students wishing to change their placement should consult an adviser as soon as possible.

Students are advised to review general chemistry before taking the placement examination. They must bring a nonprogrammable, nongraphing calculator and a #2 pencil with them to the examination; cell phones may not be used. Times and places for the examination are published in the *Calendar for the Opening Days of College*. After the examination, final placements are posted on the "Chem Placement 2014" site on Classes\*v2 (<https://classesv2.yale.edu/portal>). For further information about placement and the examination, consult the *Calendar for the Opening Days of College* and the Freshman Web site (<http://yalecollege.yale.edu/content/chemistry-1>).

**Permission keys** Enrollment in any introductory chemistry course requires an electronic permission key. Keys are issued automatically by the department for entering freshmen and are displayed as green key-shaped icons next to the appropriate courses on the online registration page. Students are blocked from enrolling in any chemistry course for which they do not possess a permission key. Students experiencing problems with permission keys should inquire in person at the department office, 183 SCL.

**Section registration in laboratory and lecture courses** Information about online registration for laboratory and discussion sections can be found in the description for each laboratory or lecture course in Online Course Information (<http://www.yale.edu/oci>). Due to the nature of laboratory exercises, it is impractical to preview laboratory courses during the course selection period.

**Placement information for upperclassmen** Upperclassmen wishing to take CHEM 114, 115, or 118 should confirm their placement at the Chem Placement site on Classes\*v2 (<https://classesv2.yale.edu/portal>) that corresponds to their year of matriculation. If permission keys are needed, upperclassmen should obtain them by inquiring at the department office, 183 SCL. Because CHEM 112 and 113 are restricted to freshmen, upperclassmen are placed into either CHEM 114, 115, or 118; those wishing to enroll in CHEM 220 may do so as long as they have satisfied the general chemistry prerequisite.

**Information for premedical students** Medical schools currently require one year of organic chemistry and laboratory as well as one year of general chemistry and laboratory. The general chemistry requirement may be satisfied by CHEM 112 and 113, or 114 and 115, or CHEM 328 or 332 followed by 333. In general, students with advanced placement taking only CHEM 115 or 118 may complete this requirement by taking a course in biochemistry with laboratory. CHEM 252, Introductory Inorganic Chemistry, with laboratory (CHEM 251L) may be substituted for the biochemistry course, but biochemistry is the preferred option. Students should consult with Undergraduate Career Services (<http://ucs.yalecollege.yale.edu>) for the most up-to-date premedical course advice.

**Major degree programs** Four degree programs are offered: a B.A., a B.S., an intensive major leading to a B.S., and a combined B.S./M.S. The B.A. degree is intended for students who want solid training in the chemical sciences and who also intend to study other subjects in which chemical training would be an asset, such as technology policy, economics, the environment, or medicine. The B.S. degree is intended to prepare students for graduate study while permitting extensive exploration of other disciplines. The B.S. degree with an intensive major provides more focused preparation for a career in chemical research, and requires greater breadth in laboratory courses and electives. Students electing this major program can also satisfy the requirements for a certified degree in chemistry as set forth by the American Chemical Society. The combined B.S./

M.S. is designed for students whose advanced preparation qualifies them for graduate-level work in their third and fourth years of college.

**The major for the Class of 2016 and previous classes** Students in the Class of 2016 and previous classes may fulfill the requirements of the major that were in place when they entered the major in Chemistry, as described in previous editions of this bulletin (<http://www.yale.edu/printer/bulletin/archivepdf/files/YCPS>). Alternatively, they may fulfill the requirements for the major as described below for the Class of 2017 and subsequent classes.

**The major for the Class of 2017 and subsequent classes** The major requires a group of prerequisites or their equivalent in advanced placement, a core of courses common to all four degree programs, advanced courses specific to each degree program, and a senior requirement. No chemistry courses taken Credit/D/Fail may be counted toward the major (including substitutions for advanced courses).

**Prerequisites common to all Chemistry degree programs** Two terms of general chemistry and laboratory, single-variable calculus at the level of MATH 115, and one term of introductory physics numbered 170 or higher, or the equivalents in advanced placement, are prerequisite to all four degree programs. Students are also encouraged to complete a course in multivariable calculus (MATH 120 or ENAS 151).

**Course requirements common to all Chemistry degree programs** All degrees require two terms of organic chemistry (CHEM 124 or 220, and CHEM 125, 221, or 230) with laboratory (CHEM 222L and 223L), one term of physical chemistry (CHEM 332 or 328), and one term of inorganic chemistry (CHEM 252, 450, 452, or 457).

**B.A. degree** In addition to the prerequisites and common degree requirements, the B.A. degree requires four additional course credits of advanced chemistry lecture or laboratory courses. At least one of the advanced courses must be a lecture course in the Chemistry department, and at least one must be a Chemistry laboratory course. CHEM 333 may be counted toward the advanced-course requirement, although not as the sole lecture course.

**B.S. degree** In addition to the prerequisites and common degree requirements, the B.S. degree requires completion of a second term of physical chemistry (CHEM 333), one term of physical chemistry laboratory (CHEM 330L), and four additional course credits of advanced chemistry lecture or laboratory courses. At least one of the advanced courses must be a lecture course in the Chemistry department, and at least one must be a Chemistry laboratory course.

**B.S. degree, intensive major** In addition to the prerequisites and common degree requirements, the B.S. degree with an intensive major requires completion of a second term of introductory physics numbered 171 or higher, a second term of physical chemistry (CHEM 333), one term of physical chemistry laboratory (CHEM 330L), and five additional course credits of advanced chemistry lecture or laboratory courses. At least two of the advanced courses must be lecture courses in the Chemistry department, and at least one must be a Chemistry laboratory course.

**Combined B.S./M.S. degree program in Chemistry** Exceptionally well-prepared students may complete a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. Formal application for



admission to this program must be made no later than the last day of classes in the fifth term of enrollment. To be considered for admission, by the end of their fifth term applicants must have achieved at least two-thirds A or A- grades in all of their course credits as well as in all of the course credits directly relating to the major, including prerequisites. Two terms of CHEM 490 must be taken in the fifth and sixth terms with grades of A or A- earned to continue in the program. The B.S./M.S. degree program requires completion of the intensive major requirements. The introductory physics requirement must be fulfilled with PHYS 200, 201 or 260, 261; a term course in physics numbered 400 or higher and approved by the director of undergraduate studies may be substituted for the introductory sequence. In addition, eight graduate courses in chemistry (four of which count toward the B.S.) are required. Four terms of research are required, including two terms of research taken in CHEM 990. Students in the program must earn grades of A in at least two of their graduate-level term courses (or in one year course) and have at least a B average in the remaining ones. B.S./M.S. candidates are also expected to continue their independent research in a summer internship between their junior and senior years. For more information, see "Simultaneous Award of the Bachelor's and Master's Degrees" in section K (p. 63) of the Academic Regulations (p. 32).

**Advanced courses** For the purposes of degree requirements, all undergraduate Chemistry courses numbered 410 or higher count as advanced lecture or laboratory courses, as do CHEM 226L, 251L, and 331L. Because most advanced courses either are offered in fall term or have a fall-term course as a prerequisite, students should not plan to take an isolated spring-term advanced course in any given year without first consulting the director of undergraduate studies. Most graduate-level Chemistry courses may also count toward the advanced-course requirement; consult the director of undergraduate studies for information about eligible courses.

**Substitutions for required courses** Up to two terms of advanced science courses outside Chemistry may be counted as electives, with the written approval of the director of undergraduate studies. CHEM 490 may not in any circumstance be substituted for any of the laboratory requirements. The graduate courses CHEM 562L, 564L, and 565L may not be counted toward any requirement of the major.

**Senior requirement for the B.A. degree** Students in the B.A. degree program must complete the senior seminar CHEM 400, in which they prepare a capstone essay on a chemistry-related topic. The paper is expected to be fifteen to twenty-five pages in length (double-spaced, twelve-point font, exclusive of figures, tables, and bibliography).

**Senior requirement for the B.S. degree** Students in the B.S. degree program may fulfill the senior requirement by completing two terms of the independent research course CHEM 490 and writing a capstone report under the guidance of a faculty member that describes their research activities. Alternatively, they may complete the senior seminar CHEM 400, in which they prepare a capstone essay on a chemistry-related topic, and complete one additional course credit of advanced chemistry lecture or laboratory courses. One term of CHEM 490 may be counted as the additional advanced course. The capstone report or essay is expected to be fifteen to twenty-five pages in length (double-spaced, twelve-point font, exclusive of figures, tables, and

bibliography). All students performing research must also present their work in the form of an oral or poster presentation as coordinated by the instructor of CHEM 490.

**Senior requirement for the B.S. degree with an intensive major** Students in the B.S. degree program with an intensive major fulfill the senior requirement by completing two terms of the independent research course CHEM 490 and writing a capstone report of fifteen to twenty-five pages (double-spaced, twelve-point font, exclusive of figures, tables, and bibliography) under the guidance of a faculty member that describes their research activities. Students in the intensive major program must also present their work in the form of an oral or poster presentation as coordinated by the instructor of CHEM 490.

**Sequence of courses** Majors are encouraged to begin their programs in the freshman year to provide the greatest flexibility in scheduling. It is possible, however, to complete the B.S. in as little as six terms if a student has advanced placement. One sample B.S. program follows, but many others are possible:

Freshman	Sophomore	Junior	Senior
CHEM 114, 115, 116L, 117L, math prereq	CHEM 220, 221, 252, 222L, 223L, physics prereq	CHEM 332, 333, 330L, 251L, 1 elective	2 terms of CHEM 490, 2 electives

**Programs of study with special emphasis** The flexibility of the degree requirements makes it possible for a student's program of study to emphasize a particular area of specialization in chemistry. For example, a program specializing in chemical biology includes CHEM 421, Chemical Biology, and two biochemistry electives chosen from MCDB 300, MB&B 300, 301, or selected graduate courses. An inorganic chemistry specialization could include CHEM 450, Physical Methods in Inorganic Chemistry, CHEM 452, Organometallic Chemistry, and CHEM 457, Modern Coordination Chemistry. A program with emphasis in physical chemistry and chemical physics would have three electives chosen from CHEM 430, Statistical Mechanics and Thermodynamics, CHEM 440, Molecules and Radiation I, CHEM 442, Molecules and Radiation II, CHEM 470, Introductory Quantum Chemistry, or a graduate course in quantum mechanics. Students interested in synthetic organic chemistry complete three electives chosen from CHEM 418, Advanced Organic Chemistry I, CHEM 423, Synthetic Methods in Organic Chemistry, CHEM 425, Spectroscopic Methods of Structure Determination, or selected graduate courses. An emphasis in biophysical chemistry includes a course in either chemical biology or biochemistry, as well as two electives chosen from graduate courses in biophysics or biochemistry. Students may design programs with other areas of emphasis in consultation with the director of undergraduate studies. For a list of graduate courses appropriate for a particular specialization, consult the director of undergraduate studies.

**Approval of major programs of study** All Chemistry majors in the sophomore, junior, and senior years must have their programs approved by the director of undergraduate studies. A program tailored to each student's goals is created and recorded on a Chemistry Course of Study form kept on file in the department office. Majors who have a current course of study form on file may have their schedules signed by the director of undergraduate studies or by any of the advisers to the major. A current list of advisers to the major may be obtained in the department office.

**Special restrictions on lecture courses** Completion of the first term of the general, organic, or physical chemistry sequences CHEM 112 and 113; CHEM 124 or 220, and CHEM 125, 221, or 230; and CHEM 332 or 328, and CHEM 333 with a passing grade is a prerequisite for registration in the subsequent term. Completion of CHEM 114 with a passing grade is a prerequisite for registration in CHEM 115 unless the student's assigned placement is in 115.

Students receive credit for only one chemistry sequence of any given type. For example, a student who has completed CHEM 112 and 113 may not subsequently enroll in CHEM 114 or 118; a student who has completed CHEM 124 and 125 may not subsequently enroll in CHEM 220, 221, or 230. Similarly, students may not enroll in a course (typically of lower number) that is a prerequisite to a course they have already taken. Thus, for example, a student who has completed an organic chemistry laboratory cannot subsequently enroll in a general chemistry laboratory.

**Special restrictions on laboratory courses** Chemistry courses may be taken without the accompanying laboratory, although the department does not recommend it. However, the appropriate lecture course is a prerequisite or corequisite for each laboratory course. This restriction can be waived only by the director of undergraduate studies. Students dropping the lecture course corequisite with a laboratory must also drop the laboratory course.

**Year or Term Abroad** Participation in the Year or Term Abroad program is available for qualified majors at Sussex University (U.K.). Interested students should consult the Chemistry Year Abroad coordinator, Robert Crabtree. In most instances, Chemistry majors find their course of study easier to schedule if they choose to study abroad in a spring term. Students studying abroad in the spring term of their junior year are required to obtain approval for the project that will fulfill their senior requirement before the end of the prior term. For general information on the Year or Term Abroad, see section K (p. 63) of the Academic Regulations.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** CHEM 112 and 113, or 114 and 115, or 118; CHEM 116L and 117L, or 119L; MATH 115 (MATH 120 or ENAS 151 suggested); PHYS 170, 180, 200, or 260; or equivalents in advanced placement

**Number of courses** *B.A.* – at least 11 term courses, totaling 10 course credits, beyond prereqs (incl senior req); *B.S.* – at least 14 term courses, totaling 13 course credits, beyond prereqs (incl senior req); *B.S., intensive major* – at least 16 term courses, totaling 15 course credits, beyond prereqs (incl senior req)

**Specific courses required** *All degrees* – 2 terms of organic chem (CHEM 124 or 220, and CHEM 125, 221, or 230); 2 terms of organic chem lab (CHEM 222L and 223L); physical chem I (CHEM 332 or 328); 1 term of inorganic chem (CHEM 252, 450, 452, or 457); *B.S.* – CHEM 330L, 333; *B.S., intensive major* – CHEM 330L, 333; PHYS 171, 181, 201, or 261

**Distribution of courses** *B.A. and B.S.* – 4 addtl course credits in advanced lectures or labs, incl at least 1 lecture and 1 lab; *B.S., intensive major* – 5 addtl course credits in advanced lectures or labs, incl at least 2 lectures and 1 lab

**Substitution permitted** Up to 2 relevant advanced science courses in other depts for advanced chem courses with DUS permission

**Senior requirement** *B.A.*—CHEM 400; *B.S.*—2 terms of CHEM 490, or CHEM 400 and 1 addtl course credit in advanced lecture or lab; *B.S., intensive major*—2 terms of CHEM 490

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## Courses for Nonmajors without Prerequisites

### **CHEM 101b, Chemistry in the Modern World** Narasimhan Ganapathi

Basic concepts necessary to understand how chemistry affects life in the modern world. Laws, events, and other ways that chemistry shapes human lives. Intended for non-science majors; no prerequisites. Does not satisfy premedical chemistry requirements or requirements for the Chemistry major. Not open to students who have completed another chemistry course at Yale. SC

### [ **CHEM 102, Introduction to Green Chemistry** ]

## Introductory Courses

Freshmen planning to take an introductory Chemistry course during their first term are required to preregister over the summer. Those planning to elect CHEM 124, 220, or 332 must also register in person and take a placement examination as described in the Chemistry department program description and on the Freshman Web site (<http://yalecollege.yale.edu/content/chemistry-1>). Placement in other introductory Chemistry courses is made on the basis of test scores and other admissions data, as discussed in the Chemistry department program description. Time and place for the orientation meeting, registration, and placement examination are listed in the *Calendar for the Opening Days of College*. For further information on placement see the Freshman Web site (<http://yalecollege.yale.edu/content/chemistry-1>).

### \* **CHEM 112a, Chemistry with Problem Solving I** Narasimhan Ganapathi

A systematic introduction to chemistry. Topics include atomic/molecular structure, stoichiometry, thermochemistry, chemical periodicity/bonding, and reactions in aqueous solutions. For beginning students in chemistry or for those whose exposure to the subject has been moderate. Special emphasis on scientific problem-solving skills through an additional discussion section devoted to quantitative reasoning. Attendance at one discussion section and one problem-solving section required. Enrollment limited to freshmen, by placement only. QR, SC RP

### \* **CHEM 113b, Chemistry with Problem Solving II** Richard Baxter

Continuation of CHEM 112. Phase-dependent properties of matter, solutions and their behavior, chemical equilibrium, chemical kinetics, and the chemistry of the elements. Attendance at one discussion section and one problem-solving section required. After CHEM 112. Enrollment limited to freshmen, by placement only. QR, SC RP

### \* **CHEM 114a or b, Comprehensive General Chemistry I** Staff

A comprehensive survey of modern descriptive, inorganic, and physical chemistry. Atomic theory, stoichiometry, thermochemistry, chemical periodicity, concepts in chemical bonding, and the shapes of molecules. For students with a good secondary school exposure to general chemistry. Attendance at a weekly discussion section required. Normally accompanied by CHEM 116L. Enrollment by placement only. QR, SC RP

**\* CHEM 115a or b, Comprehensive General Chemistry II** Staff

Kinetics, chemical equilibrium, acid-base chemistry, free energy and entropy, electrochemistry, nuclear chemistry, and descriptive chemistry of the elements. Attendance at a weekly discussion section required. Prerequisite: CHEM 114 or the equivalent in advanced placement. Normally accompanied by CHEM 117L. Enrollment by placement only. QR, SC RP

**CHEM 116La or b, General Chemistry Laboratory I** Narasimhan Ganapathi

An introduction to basic chemistry laboratory methods. Techniques required for quantitative analysis of thermodynamic processes and the properties of gases. To accompany or follow CHEM 112 or 114. May not be taken after a higher-numbered laboratory course. SC RP ½ Course cr

**CHEM 117La or b, General Chemistry Laboratory II** Narasimhan Ganapathi

Introduction to rate and equilibrium measurements, acid-base chemistry, synthesis of inorganic compounds, and qualitative/quantitative analysis. After CHEM 116L or the equivalent in advanced placement. To accompany or follow CHEM 113 or 115. May not be taken after a higher-numbered laboratory course. SC RP ½ Course cr

**\* CHEM 118a, Quantitative Foundations of General Chemistry** Mark Johnson

An advanced course emphasizing conceptual aspects and physical principles in general chemistry. Fulfills the general chemistry prerequisite for organic chemistry. Attendance at a weekly discussion section required. Must be taken concurrently with CHEM 119L. Enrollment by placement only. QR, SC

**CHEM 119La, Laboratory for Quantitative Foundations of General Chemistry**

Jonathan Parr

Introductory laboratory for students with advanced standing. Emphasis on the fundamental quantitative and physical principles of general chemistry together with quantitative and data analysis. Accompanies CHEM 118. Also suggested for freshmen enrolled in CHEM 332. SC ½ Course cr

**\* CHEM 124a, Freshman Organic Chemistry I** Jonathan Ellman

An introductory course focused on current theories of structure and mechanism in organic chemistry, their development, and their basis in experimental observation. Open to freshmen with excellent preparation in chemistry, mathematics, and physics who have taken the department's advanced chemistry placement examination. Attendance at a weekly discussion section required. Normally accompanied by CHEM 222L. Enrollment by placement only. SC RP

**\* CHEM 125b, Freshman Organic Chemistry II**

Jonathan Ellman and Alanna Schepartz

Continuation of CHEM 124. Survey of simple and complex reaction mechanisms, spectroscopy, organic synthesis, and the molecules of nature. Attendance at a weekly discussion section required. After CHEM 124. Normally accompanied by CHEM 223L. Enrollment by placement only. SC RP

## Intermediate Courses

**\* CHEM 220a or b, Organic Chemistry** Staff

An introductory course covering the fundamental principles of organic chemistry. The laboratory for this course is CHEM 222L. After college-level general chemistry. Students who have earned a grade lower than C in general chemistry are cautioned that

they may not be sufficiently prepared for this course. Usually followed by CHEM 221 or 230. SC RP

**CHEM 221a or b, The Organic Chemistry of Life Processes** Staff

The principles of organic reactivity and how they form the basis for biological processes. The laboratory for this course is CHEM 223L. After CHEM 220. Students who have earned a grade lower than C in general chemistry are cautioned that they may not be sufficiently prepared for this course. SC RP

**CHEM 222La or b, Laboratory for Organic Chemistry I** Christine DiMeglio

First term of an introductory laboratory sequence covering basic synthetic and analytic techniques in organic chemistry. Prerequisite: CHEM 117L or equivalent. After or concurrently with CHEM 124 or 220. SC ½ Course cr

**CHEM 223La or b, Laboratory for Organic Chemistry II** Christine DiMeglio

Second term of an introductory laboratory sequence covering basic synthetic and analytic techniques in organic chemistry. Prerequisite: CHEM 222L. After or concurrently with CHEM 125, 221, or 230. SC ½ Course cr

**\* CHEM 226Lb, Intensive Advanced Chemistry Laboratory**

Christine DiMeglio and Jonathan Parr

An intensive course in advanced organic chemistry laboratory technique intended to bring the student closer to independent research. Included are an independent laboratory project and presentation, introduction to library research, and training in the use of various analytical techniques. Offered subject to available laboratory space and sufficient enrollment. After CHEM 223L. For enrollment procedures, contact the instructors. WR, SC RP

**[ CHEM 230, Organic Chemistry of Biological Pathways ]**

**CHEM 251Lb, Inorganic Chemistry Laboratory** Jonathan Parr

Introductory laboratory course covering synthetic and physical characterization techniques in inorganic chemistry. Prerequisite: CHEM 119L or 222L; concurrently with or after CHEM 252. SC

**CHEM 252b, Introductory Inorganic Chemistry** Robert Crabtree

The "vigor and diversity" of modern inorganic chemistry are presented; an introduction to the fundamental concepts of solid-state chemistry, coordination chemistry, and organometallic chemistry. Prerequisite: college-level general chemistry. After or concurrently with CHEM 220 or by permission of instructor. May not be taken after CHEM 450, 452, or 457. SC RP

**CHEM 328a, Physical Chemistry with Applications in the Biological Sciences**

Elsa Yan

Physical chemical principles and their application to the chemical and life sciences. Thermodynamics, chemical and biochemical kinetics, solution physical chemistry, electrochemistry, and membrane equilibria. CHEM 332 is preferred for Chemistry majors. Prerequisites: introductory physics, college-level general chemistry, and single-variable calculus, or permission of instructor; MATH 120 or ENAS 151 suggested. May not be taken after CHEM 332. QR, SC RP

**CHEM 330La, Laboratory for Physical Chemistry I**

Patrick Vaccaro and Narasimhan Ganapathi

Introduction to the tools and techniques of modern experimental physical chemistry, including analog/digital electronics, quantitative measurements of basic thermodynamic properties, and nuclear magnetic resonance spectrometry. After or concurrently with CHEM 328 or 332. Meets on Wednesday, Thursday, and Friday from 1:30 to 2:20 for the first week of the term. SC RP

**CHEM 331Lb, Laboratory for Physical Chemistry II** Staff

Application of physical methods to chemical analysis by spectroscopic and spectrometric techniques. After CHEM 330L. After or concurrently with CHEM 333. Meets on Wednesday, Thursday, and Friday from 1:30 to 2:20 for the first week of the term. SC RP

**\* CHEM 332a, Physical Chemistry with Applications in the Physical Sciences I**

Charles Schmuttenmaer

A comprehensive survey of modern physical and theoretical chemistry, including topics drawn from thermodynamics, chemical equilibrium, electrochemistry, and kinetics. Prerequisites: introductory physics, college-level general chemistry, and single-variable calculus, or permission of instructor; MATH 120 or ENAS 151 suggested. May not be taken after CHEM 328. QR, SC RP

**\* CHEM 333b, Physical Chemistry with Applications in the Physical Sciences II**

Kurt Zilm

Continuation of CHEM 332, including topics drawn from quantum mechanics, atomic/molecular structure, spectroscopy, and statistical thermodynamics. Prerequisite: CHEM 328 or 332, or permission of instructor. Recommended preparation: familiarity with differential equations. QR, SC RP

**Advanced Courses****\* CHEM 400a, Current Chemistry Seminar** James Mayer

Designed to engage students in the Chemistry research-seminar program by providing requisite scientific guidance and a forum for directed discussion. Participants explore current avenues of chemical research as presented orally by the prime movers in the field, thereby exploring the frontiers of current knowledge while still retaining the structured environment of a classroom.

**\* CHEM 418a, Advanced Organic Chemistry I** William Jorgensen

Concise overview of structure, properties, thermodynamics, kinetics, reactions, and intermolecular interactions for organic molecular systems. Prerequisites: two terms of organic chemistry, CHEM 328 or 332, and CHEM 333. SC RP

**[ CHEM 419, Advanced Organic Chemistry II ]****CHEM 421a, Chemical Biology** Sarah Slavoff

A one-term introduction to the origins and emerging frontiers of chemical biology. Discussion of the key molecular building blocks of biological systems and the history of macromolecular research in chemistry. Prerequisites: two terms of organic chemistry, and BIOL 101 or equivalent; BIOL 102 recommended. SC RP

**CHEM 423a, Synthetic Methods in Organic Chemistry** Timothy Newhouse  
A discussion of modern methods. Functional group manipulation, synthesis and functionalization of stereodefined double bonds, carbonyl addition chemistry, and synthetic designs. Normally taken only by students with a special interest in organic synthesis; for others, CHEM 418 is more appropriate. Prerequisite: two terms of organic chemistry or permission of instructor. SC RP

**CHEM 425b, Spectroscopic Methods of Structure Determination** Martin Saunders  
Applications of NMR, ESR, infrared, UV, visible, and mass spectroscopy to chemical problems concerning structures and reactions. X-ray crystallography. Computer simulation of NMR spectra. Prerequisites: two terms of organic chemistry and CHEM 333. SC RP

**CHEM 430b, Statistical Mechanics and Thermodynamics** R. James Cross  
The fundamentals of statistical mechanics developed and used to elucidate gas phase and condensed phase behavior, as well as to establish a microscopic derivation of the postulates of thermodynamics. Topics include ensembles; Fermi, Bose, and Boltzmann statistics; density matrices; mean field theories; phase transitions; chemical reaction dynamics; time-correlation functions; and Monte Carlo and molecular dynamics simulations. Prerequisites: CHEM 328 or 332, and CHEM 333, or permission of instructor. QR, SC RP

**CHEM 437a, Chemistry of Isotopes** Martin Saunders  
Advanced applications of isotopes to chemical problems and the theory associated with them, including kinetic and equilibrium isotope effects, tracer applications, and dating.  
RP

**CHEM 440a, Molecules and Radiation I** Kurt Zilm  
An integrated treatment of quantum mechanics and modern spectroscopy. Basic wave and matrix mechanics, perturbation theory, angular momentum, group theory, time-dependent quantum mechanics, selection rules, coherent evolution in two-level systems, line shapes, Bloch equations, and NMR spectroscopy. Prerequisite: CHEM 333 or permission of instructor. QR, SC RP

**CHEM 442b, Molecules and Radiation II** Mark Johnson  
An extension of the material covered in CHEM 440 to atomic and molecular spectroscopy, including rotational, vibrational, and electronic spectroscopy, as well as an introduction to laser spectroscopy. Prerequisite: CHEM 440 or permission of instructor.  
QR, SC RP

### [ CHEM 450, Physical Methods in Inorganic Chemistry ]

**CHEM 452a, Organometallic Chemistry** Robert Crabtree  
A survey of the organometallic chemistry of the transition elements and of homogeneous catalysis. May be taken independently of CHEM 450. Prerequisites: two terms of organic chemistry and CHEM 252. SC RP

**CHEM 457a, Modern Coordination Chemistry** Patrick Holland  
The principles of modern inorganic chemistry. Main group and transition element chemistry: reactions, bonding, structure, and spectra. Prerequisite: CHEM 252 or permission of instructor. SC RP

### [ CHEM 470, Introductory Quantum Chemistry ]



\* **CHEM 490a or b, Independent Research in Chemistry** Jonathan Parr

After consulting with the director of undergraduate studies no later than the last week of the preceding academic term, students choose to work on individual laboratory and/or theoretical research problems under the supervision of a faculty member in Chemistry or in a closely related field of molecular science. Mandatory class meetings address issues of essential laboratory safety and ethics in science, with other class sessions focusing on core topics of broad interest including chemistry literature searching, oral presentation skills, and effective scientific writing. At least ten hours of research required per week. May be taken multiple times for credit. For each term of enrollment, students must complete a CHEM 490 registration form, have it signed by their research adviser and the course instructor, and submit it to the director of undergraduate studies for final approval no later than the last week of the preceding term. RP

**GRADUATE COURSES OF INTEREST TO UNDERGRADUATES**

Graduate courses in chemistry that may be of particular interest to undergraduates are listed in the online bulletin (<http://www.yale.edu/printer/bulletin/htmlfiles/grad>) of the Graduate School. Information about them is available in the office of the director of undergraduate studies. Enrollment requires permission of both the director of graduate studies and the instructor.

## Child Study Center

The Yale Child Study Center is an interdisciplinary department at the School of Medicine that furthers understanding of the problems of children and families. Among the coordinated disciplines are child psychiatry, pediatrics, genetics, neurobiology, epidemiology, psychology, nursing, social work, and social policy. The mission of the Child Study Center is to improve the mental health of children and families, advance understanding of their psychological and developmental needs, and treat and prevent childhood mental illness through the integration of research, clinical practice, and professional training. The Child Study Center is unique in its scope of local, state, national, and international collaborations in research, clinical services, training programs, and policy work. More information is available on the Center's Web site (<http://medicine.yale.edu/childstudy>).

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## Courses

\* **CHLD 125a / EDST 125a / PSYC 125a, Child Development**

Nancy Close and Carla Horwitz

The reading of selected material with supervised participant-observer experience in infant programs, a day-care and kindergarten center, or a family day-care program. Regularly scheduled seminar discussions emphasize both theory and practice. An assumption of the course is that it is not possible to understand children – their behavior and development – without understanding their parents and the relationship between child and parents. The focus is on infancy as well as early childhood. Enrollment limited to juniors and seniors. WR, SO

\* **CHLD 126b, Clinical Child Development and Assessment of Young Children**

Nancy Close

Exposure to both conceptual material and clinical observations on the complexity of assessing young children and their families. SO ½ Course cr

\* **CHLD 127a / EDST 127a / PSYC 127a, Theory and Practice of Early Childhood**

**Education: Implications of Curriculum and Policy** Carla Horwitz

Development of curricula for preschool children – infants through five-year-olds – in light of current research and child development theory. WR, SO RP

\* **CHLD 128b / EDST 128b / PSYC 128b, Language, Literacy, and Play**

Nancy Close and Carla Horwitz

The complicated role of play in the development of language and literacy skills among preschool-aged children. Topics include social-emotional, cross-cultural, cognitive, and communicative aspects of play. WR, SO RP

\* **CHLD 132b, The Concept of the Problem Child** Erika Christakis

Differing visions of good and bad, typical and atypical, children. Reasons why some children are seen as deviant and others as normal. Implications for public policy, medical practice, family dynamics, schooling, and the criminal justice and protective care systems. Sources include public health data, early childhood curricula, and depictions of problem children in literature and popular culture.

\* **CHLD 350a or b, Autism and Related Disorders** Staff

Weekly seminar focusing on autism and related disorders of socialization. A series of lectures on topics in etiology, diagnosis and assessment, treatment and advocacy, and social neuroscience methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, residence, or treatment setting for individuals with autism spectrum disorders. Details about admission to the course are explained at the first course meeting. Prerequisite: an introductory psychology course.  
SO

## Classics

Director of undergraduate studies: Emily Greenwood, Mo4 PH, 432-9457,  
emily.greenwood@yale.edu; www.yale.edu/classics

### FACULTY OF THE DEPARTMENT OF CLASSICS

**Professors** Egbert Bakker, Victor Bers, Kirk Freudenburg (*Chair*), Emily Greenwood, Verity Harte, Diana Kleiner, Christina Kraus, Joseph Manning, William Metcalf (*Adjunct*)

**Associate Professors** Milette Gaifman, Pauline LeVen, Irene Peirano

**Assistant Professors** Joshua Billings, Andrew Johnston

**Lecturers** Ann Ellis Hanson, Susan Matheson, Timothy Robinson, Barbara Shailor, Joseph Solodow

The Department of Classics offers a major in Classics, concentrating in either Greek or Latin literature, or in both literatures; a major in Classical Civilization; and, in conjunction with the Hellenic Studies program, a major in Ancient and Modern Greek.

The diversity of subject matter covered by these majors makes Classics an excellent partner in interdepartmental major programs.

### **The Major in Classics**

The major in Classics is primarily a liberal arts major. It provides a rigorous interdisciplinary education in the literature, material culture, and history that underlie Western civilization and other humanities disciplines; it can also provide foundational disciplinary expertise for students who wish to do professional graduate work. Students develop a mastery of the classical languages, become acquainted with important periods and major authors in Greek and Roman literature, and develop the linguistic, historical, and theoretical interpretative tools to analyze classical antiquity and its relevance in the modern world. All courses in the department emphasize a combination of precise analysis, original thought, creativity, and breadth of historical inquiry. Courses in other literatures, in history, and in philosophy are strongly recommended for students enrolled in the Classics major.

The candidate for the Classics major may elect either the standard or the intensive major. In both of these majors the department recognizes two kinds of concentration, one aiming at knowledge of both ancient literatures, the other concentrating on either Greek or Latin literature.

**The standard major** A standard major in both literatures requires no fewer than ten term courses. These include six term courses in Greek and Latin at the level of 390 or above, a survey of the literature and culture of ancient Athens (CLCV 256), a survey of the literature and culture of ancient Rome (CLCV 257), and two additional courses in related areas of history and art. The language courses must include GREK 390 or LATN 390 and five term courses at the level of 400 or above. One of the additional courses in a related field must be a term course in ancient history, and the other must be a term course in ancient history, classical art and archaeology, or classical civilization. Students who have completed CLCV 254 and 255 in the past may count them toward the survey requirements in the literature and culture of Athens and Rome, respectively.

Students majoring in one literature (Greek or Latin) are required to take no fewer than ten term courses. These include six term courses in that literature at the level of 390 or above, a survey of the literature and culture of ancient Athens (CLCV 256), a survey of the literature and culture of ancient Rome (CLCV 257), a term course in ancient history related to the chosen literature, and an additional term course in ancient history, classical art and archaeology, or classical civilization. The language courses must include GREK 390 or LATN 390 and at least five term courses at the level of 400 or above. Students are encouraged to do some work in the second language and may substitute two terms at the intermediate level (131 and 141) in the second language for two 400-level courses in the major literature. Students who have completed CLCV 254 and 255 in the past may count them toward the survey requirements in the literature and culture of Athens and Rome, respectively.

**Senior requirement** At the end of the senior year the student majoring in both literatures takes a comprehensive examination in the history of Greek and Latin literature and in translation of both languages; the student majoring in one literature

takes a senior departmental examination in the history of the literature of the major and in translation of that literature.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

**The intensive major** Students who desire a larger measure of independence than the standard major offers may elect the intensive major. In addition to fulfilling the requirements of the standard major (in both literatures, in Greek, or in Latin), students in the intensive major write a senior essay under the regular guidance of a faculty adviser. Students may write a one-term essay in either the fall or spring (CLSS 492), or they may write a two-term essay (CLSS 490 and 491) starting in the fall of their senior year. A brief prospectus of the essay must be submitted, preferably at the end of the junior year and in no case later than September 1 of the senior year. The candidate must submit two copies of the senior essay to the director of undergraduate studies no later than December 10 (CLSS 492a) or April 10 (CLSS 490, 491 or CLSS 492b) of the senior year.

**Combined B.A./M.A. degree program** Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See "Simultaneous Award of the Bachelor's and Master's Degrees" under section K, Special Arrangements (p. 63), in the Academic Regulations. Interested students should consult the director of undergraduate studies prior to the sixth term of enrollment for specific requirements in Classics.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 10 term courses

**Specific courses required** GREK 390 or LATN 390; CLCV 256 or 254, and 257 or 255

**Distribution of courses** *Two literatures*—6 courses in both langs at level 390 or above, with at least 5 at 400 level or above; 1 course in ancient hist; 1 addtl course in ancient hist, classical art and archaeology, or classical civ; *One literature*—6 courses in lit at level 390 or above, with at least 5 at 400 level or above; 1 course in ancient hist related to lit of major; 1 addtl course in ancient hist, classical art and archaeology, or classical civ

**Substitution permitted** *One literature*—2 courses in the other lit numbered 131 or higher for 2 courses in major lit at 400 level

**Senior requirement** Senior dept exam in hist and translation of Greek and Latin lit (*two lits*) or major lit (*one lit*)

**Intensive major** Senior essay (CLSS 490, 491 or CLSS 492) in addition to above

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#### The Major in Classical Civilization

The major in Classical Civilization is designed to offer students an opportunity to study an entire Western civilization in its many diverse but related aspects. The literature, history, philosophy, religion, art, archaeology, and other aspects of Greek and Roman antiquity from the earliest beginnings in Greece to the Middle Ages are studied for their intrinsic artistic value, their historical significance, and their power to illuminate problems confronting contemporary societies. Each year, the department offers courses that focus on ways that subsequent ages have used and made sense of classical antiquity.

Ancient texts are studied primarily in translation, though under the guidance of instructors who have expertise in Greek and Latin.

Candidates for the major complete at least twelve term courses (including the senior seminar) in Classics and related departments. Of these, two must be in ancient history and/or classical art and archaeology; and two must be in Greek or Latin, or both, numbered 131 or higher (the latter courses should be completed by the end of the junior year). Students must also take a survey of the literature and culture of ancient Athens (CLCV 256) and a survey of the literature and culture of ancient Rome (CLCV 257); those who have completed CLCV 254 and 255 in the past may count these courses toward the survey requirements. It is strongly recommended that candidates elect one course each in the general areas of ancient epic, drama, philosophy, Roman civilization, and the classical tradition. Candidates for the major are encouraged to take related courses in other departments.

**Senior requirement** Students research and complete an original research project, usually an essay, under the guidance of a faculty adviser. Students choose either a two-term senior project for two course credits (CLCV 450, 451) or a one-term senior project for one course credit (CLCV 452). A brief prospectus of the project must be submitted to the director of undergraduate studies, preferably at the end of the junior year and in no case later than September 1 of the senior year. The completed project must be submitted to the department no later than December 10 (CLCV 452a) or April 10 (CLCV 450, 451 or CLCV 452b) of the senior year. If the student has written an essay, two copies are required.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

**Approval of schedules** Programs for all majors must be approved by the director of undergraduate studies.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 term courses (incl two-term senior sem)

**Specific courses required** CLCV 256 or 254, and 257 or 255

**Distribution of courses** 2 courses in ancient hist and/or classical art and archaeology; 2 courses in Greek or Latin (or both) numbered 131 or higher

**Senior requirement** Senior project (CLCV 450, 451 or CLCV 452)

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## The Major in Ancient and Modern Greek

The major in Ancient and Modern Greek offers students an opportunity to integrate the study of postclassical Greek language, history, and culture with the departmental program in ancient Greek and classical civilization. The major covers Hellenic civilization from the Bronze Age to the modern day, and traces the development of the language and the culture across traditionally drawn boundaries. The study of both ancient and modern Greek allows the student to appreciate how familiarity with one enriches understanding of the other, and to chart the development of a language which has one of the oldest continuous written traditions in the world. The literature, history, philosophy, religion, and art of the ancient Greek and Greco-Roman worlds are studied

both as ends in themselves and also as a foundation for appreciating later (medieval, Ottoman, and modern) developments in these areas. Students are encouraged to develop a sense of the continuity of Greek language and culture, and an understanding of how Byzantine and modern forms relate to their ancient forebears.

**The standard major** The major in Ancient and Modern Greek requires at least ten term courses. These include four term courses at the level of 390 or above in ancient Greek, a survey of the literature and culture of ancient Athens (CLCV 256), a survey of the literature and culture of ancient Rome (CLCV 257), and one term course in ancient Greek history. The language courses should include GREK 390. Students who have completed CLCV 254 and 255 in the past may count them toward the survey requirements in the literature and culture of Athens and Rome, respectively. Candidates are encouraged to take a wide range of courses in the areas of ancient philosophy, religion, art, and architecture. In addition, no fewer than two term courses in modern Greek must be elected at the intermediate level (MGRK 130, 140) or above, as well as at least one additional term course in the history, art history, literature, or culture of the Greek-speaking Balkans or the Hellenic diaspora in the medieval, Ottoman, or modern period.

**Senior requirement** At the end of the senior year the student takes a comprehensive examination in the history of Greek literature.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

**The intensive major** Students who desire a larger measure of independence than the standard major offers may elect the intensive major. In addition to fulfilling the requirements of the standard major, students in the intensive major write a senior essay under the regular guidance of a faculty adviser. Students may write a one-term essay in the fall or spring (CLSS 492), or they may write a two-term essay starting in the fall of their senior year (CLSS 490 and 491). A brief prospectus of the essay must be submitted, preferably at the end of the junior year and in no case later than September 1 of the senior year. The candidate must submit two copies of the senior essay to the director of undergraduate studies no later than December 10 (CLSS 492a) or April 10 (CLSS 490, 491, or CLSS 492b) of the senior year.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 10 term courses

**Specific courses required** GREK 390, CLCV 256 or 254, and 257 or 255

**Distribution of courses** 4 term courses in ancient Greek numbered 390 or higher; 1 term course in ancient Greek hist; 2 term courses in modern Greek numbered 130 or higher; 1 term course in postclassical Greek hist or culture

**Senior requirement** Senior dept exam

**Intensive major** Senior essay (CLSS 490, 491 or CLSS 492) in addition to above

**Placement policy** Students are encouraged to take courses as advanced as they can handle with profit and pleasure. The department, recognizing the great variety of preparation in ancient languages, wishes to accommodate incoming students in as flexible a manner as possible. Students who plan either to begin or to continue the

study of Greek or Latin should consult members of the departmental faculty as soon as practicable.

Students who have had the equivalent of two years of college-level instruction may try a 400-level course. It is possible to take GREK 141 or LATN 141 after a 400-level course, or to be admitted to a 400-level course after completion of GREK 131 or LATN 131. Freshmen are encouraged to take advantage of the initial course selection period before course schedules are due to find the most appropriate course.

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## Greek

### **GREK 110a, Beginning Greek: The Elements of Greek Grammar** Staff

Introduction to ancient Greek. Emphasis on morphology and syntax within a structured program of readings and exercises. Prepares for GREK 120. No prior knowledge of Greek assumed. L1 RP 1½ Course cr

### **GREK 120b, Beginning Greek: Review of Grammar and Selected Readings** Staff

Continuation of GREK 110. Emphasis on consolidating grammar and on readings from Greek authors. The sequence GREK 110, 120 prepares for 131 or 141. Prerequisite: GREK 110 or equivalent. L2 RP 1½ Course cr

### \* **GREK 125b, Intensive Beginning Greek** Timothy Robinson

An introduction to classical Greek for students with no prior knowledge of the language. Readings from Greek authors supplement intensive instruction in grammar and vocabulary. The course is intended to be of use to students with diverse academic backgrounds and interests. Prepares for GREK 131. Not open to students who have taken GREK 110, 120. L1, L2 RP 2 Course cr

### **GREK 131a, Greek Prose: An Introduction** Staff

Close reading of selections from classical Greek prose with review of grammar. Counts as L4 if taken after GREK 141 or equivalent. L3

### **GREK 141b, Homer: An Introduction** Staff

A first approach to reading Homeric poetry in Greek. Selected books of the *Iliad* or the *Odyssey*. Counts as L4 if taken after GREK 131 or equivalent. L3

### **GREK 390a, Greek Syntax and Stylistics** Victor Bers

A review of accidence and syntax, elementary composition, and analysis of Greek prose styles of the fifth and fourth centuries B.C., including a comparison of "prosaic" and "poetic" syntax. Prerequisite: previous familiarity with some Greek prose beyond the elementary level, or permission of instructor. L5, HU

### \* **GREK 411a, Plato: Symposium** Joshua Billings

A close reading of Plato's *Symposium*, with special attention to the philosopher's language and rhetoric and to the development of character and argument. A bridge course between L4 and other L5 courses. L5

### \* **GREK 417b, Comparative Greek Grammar** Egbert Bakker

A historical and comparative study of the Greek language. Emphasis on the earliest records of Greek, the development of Greek grammar and vocabulary from Proto-Indo-European, and a comparison of this development with the grammar and vocabulary of

Latin, English, and other Indo-European languages, including Sanskrit. Prerequisite: advanced knowledge of Greek language and literature. L5, HU

\* **GREK 418b, Aristotle's Politics** Martin Devecka

Close reading of selections from Aristotle's *Politics*, with special attention to the culture of the polis, Aristotelian literary technique, and Aristotle's place in the history of political thought. Prerequisites: GREK 131 and 141 or equivalents. L5

\* **GREK 451a, Herodotus** Egbert Bakker

Introduction to selected works of Herodotus in Greek, with attention to grammar, dialect, and structure. Discussion of the author's historical methods and of other issues in secondary scholarship. L5, HU

\* **GREK 482a, Sophocles, Oedipus at Colonus** Victor Bers

Close reading of the last play written by Sophocles. Focus on the play's aesthetic and historical features, its place in the Oedipus legend, and the nature of Oedipus's apotheosis. Prerequisites: GREK 131 and 141 or equivalents. L5

## Latin

**LATN 110a, Beginning Latin: The Elements of Latin Grammar** Staff

Introduction to Latin. Emphasis on morphology and syntax within a structured program of readings and exercises. Prepares for LATN 120. No prior knowledge of Latin assumed. Preregistration, which is required, takes place at the Academic Fair. See the *Calendar for the Opening Days* or the departmental Web site for details about preregistration. L1 RP 1½ Course cr

**LATN 131a, Latin Prose: An Introduction** Staff

Close reading of a major work of classical prose; review of grammar as needed. Counts as L4 if taken after LATN 141 or equivalent. L3

**LATN 141b, Latin Poetry: An Introduction** Staff

The course is devoted to Vergil. Counts as L4 if taken after LATN 131 or equivalent. L3

**LATN 390b, Latin Syntax and Stylistics** Joseph Solodow

A systematic review of syntax and an introduction to Latin style. Selections from Latin prose authors are read and analyzed, and students compose short pieces of Latin prose. For students with some experience reading Latin literature who desire a better foundation in forms, syntax, idiom, and style. L5, HU

\* **LATN 410a, Livy's Rome** Christina Kraus

Close reading of selections from Livy's *Ab Urbe Condita*, including Books V and XXI in Latin and additional books in English translation. The nature of representation; Augustan elements in Livy's work; themes and plots of Livian history; Livy and other Roman historians; comparison of ancient historiography and contemporary historical writing. L5, HU

**LATN 411a, Early Rome from Aeneas to Romulus** Joseph Solodow

Investigation of how the Romans imagined the founding of their nation and their city, events to which they attached the highest importance yet about which they had little information. Careful reading of both prose and verse by Vergil, Livy, Ovid, and others. A bridge course between L4 and other L5 courses. L5, HU



**LATN 414b, Roman Civil Wars** Irene Peirano

Ways in which Romans constructed and represented their civil wars in literature across a variety of genres (epic, lyric, historiography), authors (Vergil, Lucan, Caesar, Sallust) and time periods (late republic, empire). L5, HU

**\* LATN 421a, Vergil's *Aeneid*** Irene Peirano

An in-depth study of Vergil's *Aeneid* within its political context. L5

**\* LATN 428b, Verse Letters** Christina Kraus

Introduction to the forms and themes of literary letters written in verse. Close reading of poetic letters in the Roman tradition, including those of Horace, Propertius, and Ovid. Comparison with literary letters written in prose, such as those of Pliny the Younger, and with documentary letters from the Greco-Roman world. L5, HU

**\* LATN 458b, Suetonius** William Metcalf

Close reading of texts from Suetonius's *Lives of the Caesars*. A bridge course between L4 and other L5 courses. L5, HU

## Classics

**\* CLSS 405a, Greek Papyrology** Ann Hanson

Literary and documentary papyri of Greek and Roman Egypt, concentrating on documents housed in the Beinecke Library from the late Ptolemaic and Roman periods. Topics include using papyri as sources for social and other histories; gaining familiarity with the language of the papyri; and the reading of literary and documentary hands. Prerequisites: proficiency in Greek; reading knowledge of German and French. L5, HU

**\* CLSS 445a, Numismatics** William Metcalf

An introduction to the history of ancient coinage and the modern methodology of numismatic study. Brief consideration of the Greek background, followed by detailed treatment of the Roman republic and empire. Prerequisite: proficiency in Greek and Latin. HU

**\* CLSS 490a and CLSS 491b, Two-Term Senior Essay for the Intensive Major in Classics** Emily Greenwood

Qualified students may write a two-term senior essay in ancient literature or classical archaeology under the guidance of a faculty adviser. A written statement of purpose must be submitted to the director of undergraduate studies.

**CLSS 492a or b, One-Term Senior Essay for the Intensive Major in Classics**

Emily Greenwood

Qualified students may write a one-term senior essay in ancient literature or classical archaeology under the guidance of a faculty adviser. A written statement of purpose must be submitted to the director of undergraduate studies.

## Classical Civilization

**\* CLCV 002b / HUMS 095b, The Romans: A Cultural Introduction**

Kirk Freudenburg

An introduction to ancient Roman culture, with special focus on the lives of common citizens, non-elites, foreigners, freedmen, and slaves. Topics include family life, the ideology of empire, religious life, spectacles of power, dining, entertainments, bathing,

travel, satire, and the law. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **CLCV 008b / HUMS 074b / LITR 091b / MGRK 001b / RSEE 008b, Western Visions of Greece** George Syrimis

Literary, philosophical, political, and aesthetic categories used by Western cultures since the Enlightenment to construct the concepts "Hellenic" and "ancient Greece." The refiguring of ancient Greek civilization as an ideal cultural template, symbolic origin, and philosophical reflection for both European philhellenes and contemporary Greeks. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **CLCV 113b / HUMS 434b / NELC 230b, Mesopotamia's Literary Legacy**

Kathryn Slanski

Major works of ancient Near Eastern literature; relationships with literary traditions in the Hebrew Bible and ancient Greece. Readings include myths, epics, wisdom literature, love poetry, and humorous stories. HU

**CLCV 125a / PHIL 125a, Introduction to Ancient Philosophy** Verity Harte

An introduction to ancient philosophy, beginning with the earliest pre-Socratics, concentrating on Plato and Aristotle, and including a brief foray into Hellenistic philosophy. Intended to be taken in conjunction with PHIL 126. HU

**CLCV 170a / ARCG 170a / HSAR 250a, Roman Art: Empire, Identity, and Society**

Diana Kleiner

Masterpieces of Roman art from the Republic to Constantine studied in their historical and social contexts. The great Romans and the monuments they commissioned—portraits, triumphal arches, columns, and historical reliefs. The concept of empire and imperial identity, politics and portraiture, the making and unmaking of history through art, and the art of women, children, freedmen, and slaves. HU

**CLCV 175b / ARCG 252b / HSAR 252b, Roman Architecture** Diana Kleiner

The great buildings and engineering marvels of Rome and its empire. Study of city planning and individual monuments and their decoration, including mural painting. Emphasis on developments in Rome, Pompeii, and central Italy; survey of architecture in the provinces. HU

**CLCV 204b / HIST 300b, Alexander the Great and the Hellenistic World**

Joseph Manning

The history and culture of the ancient world between the rise of Macedonian imperialism in the fourth century B.C.E. and the annexation of Egypt by Augustus in 30 B.C.E. Particular attention to Alexander, one of the most important figures in world history, and to the definition of "Hellenism." HU

**CLCV 220b / PHIL 218b, Ancient Epistemology** Verity Harte

Theories of knowledge of various philosophers and philosophical schools in antiquity, including Plato, Aristotle, the Stoics, the Epicureans, and the Sceptics. Prerequisite: PHIL 125 or DRST 003. HU

**CLCV 226a / HIST 330a, Ancient Empires** Joseph Manning and François Gerardin

The history and institutions of empires in the ancient Near East, Egypt, and the Mediterranean world. Some comparison with other early empires in areas such as

China. The roles of law, religion, and ethnicity and identity; economic institutions and structures. HU

\* **CLCV 238b, Classics in Africa and the Black Diaspora** Emily Greenwood

The reception and appropriation of Greco-Roman classics in Africa and the black diaspora during the twentieth century. The same classical canon that had been used to furnish arguments for colonialism, imperialism, and racism read by black writers and artists in ways that subverted those arguments. Works include drama from Nigeria and South Africa, Caribbean poetry and autobiography, novels by Ralph Ellison and Toni Morrison, and the Odysseus collages of Romare Bearden. HU

**CLCV 257b, Cultural Introduction to the Romans** Kirk Freudenburg

An introduction to ancient Roman culture. Focus on the ideals of elite identity and on the lives that were lived on the margins of those ideals, by slaves, prostitutes, freedmen, gladiators, foreigners, and the urban poor. Rome both as a city of grandeur and pageantry and as a place of unthinkable cruelty and injustice. HU

\* **CLCV 268a / HSAR 423a, The Art of Dionysos: Drink, Drama, and Ecstasy**

Millette Gaifman

Artifacts of Greek art and architecture made in honor of Dionysos, the god of wine and theater, whose worship involved ecstatic experiences. The Great Dionysia, a festival where theatrical productions were performed, as the source of inspiration for artifacts and architectural monuments. Objects and structures such as painted vases and theaters as means of keeping the realm of Dionysos present in daily experience. HU

**CLCV 269b / NELC 351b, Antiquity in Islam** Martin Devecka and Dimitri Gutas

Historical and sociological study of the emergence of Islam in its late antique setting, as well as its links to the classical cultures of the Mediterranean, Near East, and Iranian plateau. HU

\* **CLCV 282a / HSAR 419a, Art and Culture in the Roman Provinces** Lisa Brody

The diversity of identities created by the interaction of Roman imperial culture and local traditions in the Roman provinces. Issues related to daily life, politics, technology, and religion. Close work with objects from the Yale University Art Gallery, including mosaics, ceramics, glass, textiles, coins, and jewelry.

\* **CLCV 407a / HIST 207Ja, Thucydides and the Peloponnesian War** Donald Kagan

A study both of the great war between Athens and Sparta that transformed the world of the Greek city-states and of the brilliant historian and political thinker who described it. HU

\* **CLCV 429a / PHIL 400a, Aristotle's Nicomachean Ethics, Book VI**

Verity Harte and David Charles

Reading and discussion of the Greek text of Aristotle's *Nicomachean Ethics*, Book VI, in which Aristotle characterizes the intellectual virtues and offers his most complete account of various forms of skill and knowledge. Prerequisites: GREK 131, 141, and PHIL 125 or equivalents, or with permission of the instructors. L5, HU

\* **CLCV 436a / RLST 246a, Theories of Authorship and Canon**

Hindy Najman and Irene Peirano

The relationship between authorship and canon formation in ancient and modern theory. Authorial practices of Greco-Roman, Jewish, and Christian communities in antiquity compared with modern theories of authorship and attribution. The creation

of literary traditions; the changing role of the author; the effects of reading practices on literary survival. HU

**\* CLCV 450a and CLCV 451b, Two-Term Senior Project for the Major in Classical Civilization** Emily Greenwood

The first term of a two-term senior project. An appropriate instructor is assigned to each student by the director of undergraduate studies in consultation with the student. Selected readings compensate for individual deficiencies and help the student achieve a balanced overview.

**\* CLCV 452a or b, One-Term Senior Project for the Major in Classical Civilization** Staff

A one-term senior project. Students select a topic for research from any area of the literature, history, culture, or philosophy of ancient Greece, Rome, or Hellenistic Egypt, or a topic from the classical tradition. An appropriate instructor is assigned to each student by the director of undergraduate studies in consultation with the student.

**\* CLCV 494a or b, Independent Tutorial in Classical Civilization** Staff

For students who wish to pursue a specialized subject in classical civilization not otherwise covered in courses. Students are expected to provide a detailed reading list and a clear outline of their project early in the term. The work should result in a term paper or examination. A limited number of these courses may be offered toward the major. Readings in translation. Offered subject to faculty availability.

**GRADUATE COURSES OF INTEREST TO UNDERGRADUATES**

Various graduate seminars are open to juniors and seniors with the qualifications expected of graduate students, i.e., proficiency in the pertinent ancient and modern languages. Descriptions of the courses are available from the director of undergraduate studies. Permission is required of the instructor, the director of undergraduate studies, and the director of graduate studies.

## Cognitive Science

Director of undergraduate studies: Joshua Knobe, 102 C, 432-1699,  
joshua.knobe@yale.edu; www.yale.edu/cogsci

**FACULTY ASSOCIATED WITH THE PROGRAM IN COGNITIVE SCIENCE**

**Professors** Woo-kyoung Ahn (*Psychology*), Stephen Anderson (*Linguistics*), Amy Arnsten (*School of Medicine*), John Bargh (*Psychology*), Paul Bloom (*Chair*) (*Psychology*), Hal Blumenfeld (*School of Medicine*), Marvin Chun (*Psychology*), Michael Della Rocca (*Philosophy*), Ravi Dhar (*School of Management*), Julie Dorsey (*Computer Science*), Carol Fowler (*Adjunct*) (*Psychology*), Robert Frank (*Linguistics*), David Gelernter (*Computer Science*), Tamar Gendler (*Philosophy*), Laurence Horn (*Linguistics*), Marcia Johnson (*Psychology*), Dan Kahan (*Law School*), Frank Keil (*Psychology, Linguistics*), Joshua Knobe (*Philosophy*), Gregory McCarthy (*Psychology*), Drew McDermott (*Computer Science*), Nathan Novemsky (*School of Management, Psychology*), Rhea Paul (*School of Medicine*), Kenneth Pugh (*School of Medicine*), Ian Quinn (*Music*), Holly Rushmeier (*Computer Science*), Brian Scholl (*Psychology*), Sun-Joo Shin (*Philosophy*), Zoltán Szabó (*Philosophy*), Fred Volkmar (*School of Medicine*), Xiao-Jing Wang (*School of Medicine*), David Watts (*Anthropology*), Bruce Wexler (*School of Medicine*), Karen

Wynn (*Psychology*), Raffaella Zanuttini (*Linguistics*), Steven Zucker (*Computer Science, Biomedical Engineering*)

**Associate Professors** Keith Chen (*School of Management*), Daeyeol Lee (*School of Medicine*), James Mazer (*School of Medicine*), Kevin Pelphrey (*School of Medicine*), Maria Piñango (*Linguistics*), Laurie Santos (*Psychology*), Brian Scassellati (*Computer Science*)

**Assistant Professors** Daylian Cain (*School of Management*), Yarrow Dunham (*Psychology*), Gaja Jarosz (*Linguistics*), Hedy Kober (*School of Medicine*), George Newman (*School of Management*), Ève Poudrier (*Music*), David Rand (*Psychology*), Gregory Samanez-Larkin (*Psychology*)

**Lecturer** Kathryn Davidson

Cognitive science explores the nature of cognitive processes such as perception, reasoning, memory, attention, language, decision making, imagery, motor control, and problem solving. The goal of cognitive science, stated simply, is to understand how the mind works. Cognitive science is an inherently interdisciplinary endeavor, drawing on tools and ideas from fields such as psychology, computer science, linguistics, philosophy, economics, and neuroscience. Approaches include empirical studies of the ontogenetic and phylogenetic development of cognitive abilities, experimental work on cognitive processing in adults, attempts to understand perception and cognition based on patterns of breakdown in pathology, computational and robotic research that strives to simulate aspects of cognition and behavior, neuroscientific investigations of the neural bases of cognition using neural recording and brain scanning, and the development of philosophical theories of the nature of mind.

**Introductory course** An introductory survey course, CGSC 110, is normally taken by the end of the fall term of the sophomore year and prior to admission to the major.

**The major for the Class of 2015** Students in the Class of 2015 may fulfill the requirements of the Cognitive Science major that were in place when they entered the major, as described in previous editions of this bulletin (<http://www.yale.edu/printer/bulletin/archivepdf/files/YCPS>). Alternatively, they may fulfill the requirements for the major as described below for the Class of 2016 and subsequent classes.

**Requirements of the major for the Class of 2016 and subsequent classes** Fourteen term courses, for a total of thirteen course credits, are required for the major, including the introductory course and the senior requirement. Each major program must include the elements described below. The particular selection of courses must be approved by the director of undergraduate studies in order to assure overall coherence.

A breadth requirement introduces students to the subfields of cognitive science. Each student is required to take a course from four of the following six areas:

1. Computer science: CPSC 201
2. Economics and decision making: ECON 159, PSYC 553
3. Linguistics: LING 110, 116, 117, 130, 232, 253
4. Neuroscience: CGSC 201, MCDB 320, PSYC 160, 270
5. Philosophy: PHIL 126, 181, 269, 270, 271

## 6. Psychology: PSYC 110, 140, 304

Students also fulfill a depth requirement by completing six courses that focus on a specific topic or area in cognitive science. The depth courses must be chosen from at least two disciplines, and are typically drawn from the six cognitive science subfields. It may be possible to draw depth courses from other fields when necessary to explore the student's focal topic, in consultation with the director of undergraduate studies. All six depth courses must be at the intermediate or advanced level; for most disciplines, courses numbered 300 or above fulfill the requirement. With permission of the director of undergraduate studies, up to one directed reading or research course may count toward the depth requirement.

Because formal techniques are fundamental to cognitive science, one skills course is required, preferably prior to the senior year. Courses that fulfill the skills requirement include CPSC 112, 202, LING 224, PSYC 200, and 270. Other courses may fulfill this requirement with permission of the director of undergraduate studies. No course may be used to fulfill more than one requirement for the major.

In the junior year, students are required to take CGSC 395, a half-credit colloquium in which majors discuss current issues and research in cognitive science and select a senior essay topic.

**Senior requirement** In the senior year, students take CGSC 491, a half-credit capstone course in which the senior essay is written. Students in the course meet regularly with one another and with the faculty to discuss current work in cognitive science and their own developing research projects.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of the major, except with permission of the director of undergraduate studies.

**Application to the major** Students can apply to enter the major at any point after the freshman year. Applications must be made in writing to the director of undergraduate studies. Applications must include (a) an official or unofficial transcript of work at Yale, (b) a brief statement of purpose, which indicates academic interests and expected focus within the areas of the Cognitive Science major, and (c) a list of the six upper-level courses that the student plans to take as part of the research focus. Application forms and answers to frequently asked questions are available on the program's Web site ([http://www.yale.edu/cogsci/info\\_undergrad.html](http://www.yale.edu/cogsci/info_undergrad.html)).

## REQUIREMENTS OF THE MAJOR

**Prerequisite** CGSC 110

**Number of courses** 14 term courses, for a total of 13 course credits (incl prereq and senior req)

**Specific course required** CGSC 395

**Distribution of courses** 1 course each in 4 of 6 subfields, as specified; 6 courses in a specific topic or area, as specified; 1 skills course, as specified

**Senior requirement** Senior essay (CGSC 491)

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## Introductory Courses

**CGSC 110a / PSYC 130a, Introduction to Cognitive Science** Brian Scholl

An introduction to the interdisciplinary study of how the mind works. Discussion of tools, theories, and assumptions from psychology, computer science, neuroscience, linguistics, and philosophy. SO

\* **CGSC 215a or b / LING 215a or b, Sign Languages and the Mind** Kathryn Zarella

Analysis of sign languages at different levels of linguistic structure, such as phonology, morphology, syntax, and semantics. Related aspects of cognition in the visual modality, including working memory, the neural bases for sign language, and deafness and language development. Ways in which perspectives from manual/visual language study can inform general theories of linguistic structure, plasticity, and domain generality in cognitive science. SO

**CGSC 216b / LING 116b, Cognitive Science of Language** Robert Frank

The study of language from the perspective of cognitive science. Exploration of mental structures that underlie the human ability to learn and process language, drawing on studies of normal and atypical language development and processing, brain imaging, neuropsychology, and computational modeling. Innate linguistic structure vs. determination by experience and culture; the relation between linguistic and nonlinguistic cognition in the domains of decision making, social cognition, and musical cognition; the degree to which language shapes perceptions of color, number, space, and gender. SO

**CGSC 282b / PHIL 182b / PSYC 182b, Perspectives on Human Nature** Joshua Knobe

Comparison of philosophical and psychological perspectives on human nature. Nietzsche on morality, paired with contemporary work on the psychology of moral judgment; Marx on religion, paired with systematic research on the science of religious belief; Schopenhauer paired with social psychology on happiness. HU

## Advanced Courses

**CGSC 315b / PSYC 315b, The Modern Unconscious** John Bargh

The notion of the unconscious mind traced from the early 1800s through Freud to present-day cognitive science, with a focus on the past thirty years. The power and function of the unconscious as a pervasive part of normal everyday human functioning. Readings from philosophy of mind and evolutionary biology. SO

\* **CGSC 358a / MUSI 358a, Cognition of Musical Rhythm** Ève Poudrier

An introduction to the study of musical rhythm from the dual perspective of music theory and psychology. The nature of musical temporality explored through study of works from a variety of musical styles and through a survey of relevant experimental work on rhythm perception and production. Topics include cognitive limits on the perception of temporal structures; categorical perception and the role of memory; attention, entrainment, and sensorimotor synchronization; expressive timing; and complex rhythmic structures. HU

\* **CGSC 390b, Junior Seminar in Cognitive Science** Kathryn Zarella

Discussion of historically important papers in cognitive science. Topics are varied and reflect student interests. Some attention to planning for the senior project. Intended for juniors in the Cognitive Science major.

\* **CGSC 423a / PSYC 423a, Cognitive Science of Good and Evil** Paul Bloom  
 Feelings and sentiments that relate to morality, including empathy, disgust, anger, shame, guilt, envy, lust, and love. The evolution of such moral emotions, ways in which they are influenced by culture, and whether they are reliable guides to moral thought and action. Perspectives from philosophy, social and developmental psychology, evolutionary biology, theology, and law. SO

\* **CGSC 425b, Social Perception** Brian Scholl  
 Connections between visual perception, among the earliest and most basic of human cognitive processes, and social cognition, among the most advanced forms of higher-level cognition. The perception of animacy, agency, and goal-directedness; biological motion; face perception (including the perception of facial attractiveness); gaze processing and social attention; "thin-slicing" and "perceptual stereotypes"; and social and cultural influences on perception. SO

## Courses for Majors

\* **CGSC 395a, Junior Colloquium in Cognitive Science** Kathryn Zaremba  
 Survey of contemporary issues and current research in cognitive science. By the end of the term, students select a research topic for the senior essay. Enrollment limited to Cognitive Science majors. ½ Course cr

\* **CGSC 471a and CGSC 472b, Directed Research in Cognitive Science** Joshua Knobe  
 Research projects for qualified students. The student must be supervised by a member of the Cognitive Science faculty, who sets the requirements and directs the research. To register, a student must submit a written plan of study to the director of undergraduate studies and the faculty supervisor. The normal minimum requirement is a written report of the completed research, but individual faculty members may set alternative equivalent requirements. Only one term may be offered toward the major, with permission of the director of undergraduate studies; two terms may be offered toward the bachelor's degree.

\* **CGSC 473a and CGSC 474b, Directed Reading in Cognitive Science** Joshua Knobe  
 Individual study for qualified students who wish to investigate an area of cognitive science not covered in regular courses. The student must be supervised by a member of the Cognitive Science faculty, who sets the requirements and meets regularly with the student. To register, a student must submit a written plan of study to the director of undergraduate studies and the faculty supervisor. The normal minimum requirement is a term paper, but individual faculty members may set alternative equivalent requirements. Only one term may be offered toward the major, with permission of the director of undergraduate studies; two terms may be offered toward the bachelor's degree.

**CGSC 490a, Senior Colloquium** Kathryn Zaremba  
 A research colloquium leading to the selection of a topic for the senior essay. Students attend regular colloquium presentations by outside scholars. Enrollment limited to Cognitive Science majors in the Class of 2015. ½ Course cr

\* **CGSC 491b, Senior Project** Kathryn Zaremba  
 A research colloquium leading to the completion of the senior essay. Students attend regular colloquium presentations. Enrollment limited to Cognitive Science majors. ½ Course cr



## Related Courses That May Count toward the Major

### \* **CHLD 350a or b, Autism and Related Disorders** Staff

Weekly seminar focusing on autism and related disorders of socialization. A series of lectures on topics in etiology, diagnosis and assessment, treatment and advocacy, and social neuroscience methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, residence, or treatment setting for individuals with autism spectrum disorders. Details about admission to the course are explained at the first course meeting. Prerequisite: an introductory psychology course. SO

### **CPSC 112a or b, Introduction to Programming** Staff

Development on the computer of programming skills, problem-solving methods, and selected applications. No previous experience with computers necessary. QR

### **CPSC 201a or b, Introduction to Computer Science** Staff

Introduction to the concepts, techniques, and applications of computer science. Topics include computer systems (the design of computers and their languages); theoretical foundations of computing (computability, complexity, algorithm design); and artificial intelligence (the organization of knowledge and its representation for efficient search). Examples stress the importance of different problem-solving methods. After CPSC 112 or equivalent. QR

Math: Stat/Applied Math

### **CPSC 202a, Mathematical Tools for Computer Science** Dana Angluin

Introduction to formal methods for reasoning and to mathematical techniques basic to computer science. Topics include propositional logic, discrete mathematics, and linear algebra. Emphasis on applications to computer science: recurrences, sorting, graph traversal, Gaussian elimination. QR

### **CPSC 470a, Artificial Intelligence** Drew McDermott

Introduction to artificial intelligence research, focusing on reasoning and perception. Topics include knowledge representation, predicate calculus, temporal reasoning, vision, robotics, planning, and learning. After CPSC 201 and 202. QR

### **ECON 159a, Game Theory** Zvika Neeman

An introduction to game theory and strategic thinking. Ideas such as dominance, backward induction, Nash equilibrium, evolutionary stability, commitment, credibility, asymmetric information, adverse selection, and signaling are applied to games played in class and to examples drawn from economics, politics, the movies, and elsewhere. After introductory microeconomics. No prior knowledge of game theory assumed. QR, SO

### **LING 110a, Language: Introduction to Linguistics** Jim Wood

The goals and methods of linguistics. Basic concepts in phonology, morphology, syntax, and semantics. Techniques of linguistic analysis and construction of linguistic models. Trends in modern linguistics. The relation of linguistics to psychology, logic, and other disciplines. SO

### **LING 220b / PSYC 318b, General Phonetics** Staff

Investigation of possible ways to describe the speech sounds of human languages. Acoustics and physiology of speech; computer synthesis of speech; practical exercises in producing and transcribing sounds. (Formerly LING 120) SO

**\* LING 224a, Formal Foundations of Linguistic Theories** Robert Frank

Study of formal systems that play an important role in the scientific study of language. Exploration of a range of mathematical structures and techniques; demonstrations of their application in theories of grammatical competence and performance including set theory, graphs and discrete structures, algebras, formal language, and automata theory. Evaluation of strengths and weaknesses of existing formal theories of linguistic knowledge. QR

**LING 227b / PSYC 327b, Language and Computation** Gaja Jarosz

Design and analysis of computational models of language. Topics include finite state tools, computational morphology and phonology, grammar and parsing, lexical semantics, and the use of linguistic models in applied problems. Prerequisite: Prior programming experience or permission of instructor. (Formerly LING 141) QR, SO

**LING 232a, Introduction to Phonological Analysis** Gaja Jarosz

The structure of sound systems in particular languages. Phonemic and morphophonemic analysis, distinctive-feature theory, formulation of rules, and problems of rule interpretation. Emphasis on problem solving. Prerequisite: LING 220, or a grade of B or above in LING 110. (Formerly LING 132) SO

**\* LING 235b, Phonological Theory** Gaja Jarosz

Topics in the architecture of a theory of sound structure. Motivations for replacing a system of ordered rules with a system of ranked constraints. Optimality theory: universals, violability, constraint types and their interactions. Interaction of phonology and morphology, as well as the relationship of phonological theory to language acquisition and learnability. Opacity, lexical phonology, and serial versions of optimality theory. Prerequisite: LING 232 or permission of instructor. (Formerly LING 135) SO

RP

**LING 253a, Syntax I** Jim Wood

An introduction to the syntax of natural language. Generative syntactic theory and key theoretical concepts. Syntactic description and argumentation. Topics include the structure of clauses and noun phrases, movement operations, and the notion of parameter. (Formerly LING 153) SO

**LING 254b, Syntax II** Raffaella Zanuttini

Recent developments in the principles and parameters approach to syntactic theory. In-depth exploration of theoretical and empirical issues in long-distance dependencies (island effects, dependency types, movement vs. binding), the character of syntactic structure (constituency, thematic mapping, functional categories), and the architecture of grammatical derivations (logical form, operations for structure building, anaphora). Prerequisite: LING 253. SO

**LING 263b, Semantics** Ashwini Deo

Introduction to truth-conditional compositional semantics. Set theory, first- and higher-order logic, and the lambda calculus as they relate to the study of natural language meaning. Some attention to analyzing the meanings of tense/aspect markers, adverbs, and modals. QR, SO

**\* LING 280b, Morphology** Jim Wood

The theory of word structure within a formal grammar. Relation to other areas of grammar (syntax, phonology); basic units of word structure; types of morphology

(inflection, derivation, compounding). Prerequisites: LING 232 and 253, or permission of instructor. SO

**MCDB 320a, Neurobiology** Haig Keshishian and Paul Forscher

The excitability of the nerve cell membrane as a starting point for the study of molecular, cellular, and systems-level mechanisms underlying the generation and control of behavior. After a year of college-level chemistry; a course in physics is strongly recommended. SC

**PHIL 126b, Introduction to Modern Philosophy from Descartes to Kant**

Keith DeRose

An introduction to major figures in the history of modern philosophy, with critical reading of works by Descartes, Malabranche, Spinoza, Leibniz, Locke, Berkeley, Hume, and Kant. Intended to be taken in conjunction with PHIL 125, although PHIL 125 is not a prerequisite. HU

**PHIL 267b, Mathematical Logic** Sun-Joo Shin

An introduction to the metatheory of first-order logic, up to and including the completeness theorem for the first-order calculus. Introduction to the basic concepts of set theory. Prerequisite: PHIL 115 or permission of instructor. QR  
Math: Logic/Foundations

**PHIL 271b / LING 271b, Philosophy of Language** Bruno Whittle

An introduction to contemporary philosophy of language, organized around four broad topics: meaning, reference, context, and communication. Introduction to the use of logical notation. HU

**PSYC 110a or b, Introduction to Psychology** Staff

A survey of major psychological approaches to the biological, cognitive, and social bases of behavior. SO

**PSYC 140a, Developmental Psychology** Frank Keil

An introduction to research and theory on the development of perception, action, emotion, personality, language, and cognition from a cognitive science perspective. Focus on birth to adolescence in humans and other species. Prerequisite: PSYC 110. SO  
Psychology: Social Science  
Psychology: Core

**PSYC 150b, Social Psychology** Marianne LaFrance

Study of social cognition, attitudes and persuasion, group processes, intergroup processes, prosocial behavior, aggression, and conformity. Theories, methodology, and applications of social psychology. Prerequisite: PSYC 110. SO  
Psychology: Core  
Psychology: Social Science

**PSYC 160a, The Human Brain** Gregory McCarthy

Introduction to the neural bases of human psychological function, including social, cognitive, and affective processing. Preparation for more advanced courses in cognitive and social neuroscience. Topics include memory, reward processing, neuroeconomics, individual differences, emotion, social inferences, and clinical disorders. Neuroanatomy, neurophysiology, and neuropharmacology are also introduced. SC  
Psychology: Core  
Psychology: Natural Science

**PSYC 200b, Statistics** Jaime Napier

Measures of central tendency, variability, association, and the application of probability concepts in determining the significance of research findings. QR

**\* PSYC 270b, Research Methods in Behavioral Neuroscience** Nelson Donegan

Laboratory course in which students design and conduct research to study brain function and behavior. Emphasis on hands-on participation in behavioral and neuroscience techniques. Prerequisites: PSYC 160 or 170, and a course in statistics, or with permission of instructor. SC

Psychology: ResearchMethods

Psychology: Natural Science

## College Seminars

Residential college seminars for the fall and spring terms are described on the college seminar program's Web site (<http://yalecollege.yale.edu/academics/special-academic-programs/residential-college-seminar-program>). The online listings contain course titles, descriptions, and prerequisites. Course syllabi are available on Classes\*v2 (<http://classesv2.yale.edu>).

Students apply to college seminars before classes begin through an online tool on the program's Web site (<http://yalecollege.yale.edu/academics/special-academic-programs/residential-college-seminar-program/application-information>) or through a link in the online course description. Students may apply to a maximum of two college seminars in a given term; choices are not ranked by order of preference. Students may enroll in no more than one college seminar per term and may enroll in no more than four total during their time at Yale. Auditing is not permitted in college seminars.

## Computer Science

Director of undergraduate studies: James Aspnes, 401 AKW, 432-1232, [james.aspnes@yale.edu](mailto:james.aspnes@yale.edu); [cpsc.yale.edu](http://cpsc.yale.edu)

### FACULTY OF THE DEPARTMENT OF COMPUTER SCIENCE

**Professors** Dana Angluin, James Aspnes, Julie Dorsey, Stanley Eisenstat, Joan Feigenbaum (*Chair*), Michael Fischer, David Gelernter, Paul Hudak, Drew McDermott, Vladimir Rokhlin, Holly Rushmeier, Brian Scassellati, Martin Schultz (*Emeritus*), Zhong Shao, Avi Silberschatz, Daniel Spielman, Y. Richard Yang, Steven Zucker

**Associate Professors** Daniel Abadi, Bryan Ford

**Assistant Professor** Ruzica Piskac

**Lecturer** Brad Rosen

The Department of Computer Science offers both B.S. and B.A. degree programs, as well as three combined majors in cooperation with other departments: Electrical Engineering and Computer Science (p. 269), Computer Science and Mathematics (p. 218), and Computer Science and Psychology (p. 218). Each major program not only provides a solid technical education but also allows students either to take a broad range of courses in other disciplines or to complete the requirements of a second major.

The Computer Science and combined major programs share a common core of five computer science courses. The first is CPSC 201, a survey that demonstrates the breadth and depth of the field to students who have taken the equivalent of an introductory programming course. The remaining core courses cover discrete mathematics, data structures, systems programming and computer architecture, and algorithm analysis and design. Together these courses include the material that every major should know.

The core courses are supplemented by electives (and, for the combined majors, core courses in the other discipline) that offer great flexibility in tailoring a program to each student's interests. The capstone is the senior project, through which students experience the challenges and rewards of original research under the guidance of a faculty mentor.

Prospective majors are encouraged to discuss their programs with the director of undergraduate studies as early as possible.

**Introductory courses** The department offers a broad range of introductory courses to meet the needs of students with varying backgrounds and interests. With the exception of CPSC 201, none assumes previous knowledge of computers.

1. CPSC 112 teaches students majoring in any subject area how to program a computer and solve problems using the language Java. Students with previous programming experience should consider taking CPSC 201 instead.
2. CPSC 150 explores how some of the key ideas in computer science have affected philosophy of mind, cognitivism, connectionism, and related areas. This humanities-style course has significant readings and a paper, and satisfies the writing or the humanities and arts distributional requirement.
3. CPSC 151 studies the history of the graphical user interface in an attempt to guess its future. This course also satisfies the writing distributional requirement.
4. CPSC 183 explores the myriad ways that law and technology intersect, with a special focus on the role of cyberspace. This course satisfies the social science distributional requirement.
5. CPSC 201 surveys the field of computer science, including systems (computers and their languages) and theory (algorithms, complexity, and computability). Students with sufficient programming experience may elect CPSC 201 without taking CPSC 112. (These courses meet at the same time so that students are easily able to change levels if necessary.)
6. CPSC 202 presents the formal methods of reasoning and the concepts of discrete mathematics and linear algebra used in computer science and related disciplines.

**Requirements of the major** The B.S. and the B.A. degree programs have the same required core courses: CPSC 201; CPSC 202 or MATH 244; CPSC 223, 323, 365, and 490. The B.S. degree program requires six additional intermediate or advanced courses in Computer Science, for a total of twelve; the B.A. degree program, four, for a total of ten. CPSC 480 and 490 may not be counted toward these electives. All courses in the major must be taken for a letter grade.

Students majoring in Computer Science are advised to complete CPSC 201 and 223 by the end of the sophomore year.

For students who already know how to program, typical B.S. programs starting in the freshman and sophomore years are:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
CPSC 201a	CPSC 202a CPSC 323a	Two electives	CPSC 490a
CPSC 223b	CPSC 365b One elective	Two electives	One elective

and

<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
CPSC 201a	CPSC 323a	CPSC 490a
CPSC 202a	One elective	Two electives
CPSC 223b	CPSC 365b Two electives	Two electives

For typical B.A. programs, two of the electives would be omitted.

**Electives** The Computer Science department encourages interdisciplinary study in which computer science plays a major role. Advanced courses in other departments that involve concepts from computer science and are relevant to an individual program may, with permission of the director of undergraduate studies, be counted toward the requirements.

Students considering graduate study in computer science are advised to take CPSC 421 and 422, as well as courses covering the breadth of computer science, including programming languages and systems, artificial intelligence, scientific computing, and theoretical computer science.

Students interested in using computers to solve scientific and engineering problems are advised to take CPSC 440 as well as computational courses offered in Applied Mathematics (p. 130) and in Engineering and Applied Science (p. 273).

The core mathematical background necessary to complete the Computer Science major is provided in CPSC 202. However, many advanced courses in graphics, computer vision, neural networks, and numerical analysis assume additional knowledge of linear algebra and calculus. Students who plan to take such courses as electives and who are unsure whether they have the appropriate mathematical background are encouraged to take MATH 222 or 225 and MATH 120.

**Senior requirement** In the senior year students must take CPSC 490, an independent project course in which students select an adviser to guide them in research in a subfield of computer science. With permission of the director of undergraduate studies, students may enroll in 490 more than once or before their senior year.

**Schedule approval** All Computer Science majors in the sophomore, junior, and senior years should have their programs approved by the director of undergraduate studies.

**Combined B.S./M.S. degree program in Computer Science** Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. Eligibility requirements are described under Simultaneous Award of the Bachelor's and Master's

Degrees in Section K (p. 63) of the Academic Regulations. Specific requirements for the combined degree in Computer Science are as follows:

1. Candidates must satisfy the Yale College requirements for the B.S. degree in Computer Science.
2. In fulfilling these requirements, students must complete eight graduate courses from the approved list, up to two of which may, with the permission of the director of undergraduate studies and the director of graduate studies, also be applied toward completion of the B.S. degree. At most one of these eight courses may be CPSC 690, 691, or 692.
3. At the end of their fifth term of enrollment students must have achieved at least three-fourths A or A- grades in all of their course credits directly relating to the major.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** *B.S.* – 12 term courses taken for letter grades (incl senior project);

*B.A.* – 10 term courses taken for letter grades (incl senior project)

**Specific courses required** *B.S. and B.A.* – CPSC 201; CPSC 202 or MATH 244;

CPSC 223, 323, 365

**Distribution of courses** *B.S.* – 6 addtl intermediate or advanced Comp Sci courses;

*B.A.* – four addtl intermediate or advanced Comp Sci courses

**Substitution permitted** Advanced courses in other depts, with DUS permission

**Senior requirement** Senior project (CPSC 490)

## Introductory Courses

**CPSC 112a or b, Introduction to Programming** Staff

Development on the computer of programming skills, problem-solving methods, and selected applications. No previous experience with computers necessary. QR

\* **CPSC 150a / HUMS 407a, Computer Science and the Modern Intellectual Agenda**

David Gelernter

Introduction to the basic ideas of computer science (computability, algorithm, virtual machine, symbol processing system), and of several ongoing relationships between computer science and other fields, particularly philosophy of mind. No previous experience with computers necessary. Enrollment limited to 25. WR, HU

\* **CPSC 151b / HUMS 408b, The Graphical User Interface** David Gelernter

The role of graphical user interfaces (GUIs) on standard platforms such as desktop PCs, laptops, and small-screen devices. Discussion of how and why GUIs developed as they did, why they have evolved so little since the desktop computers of the 1970s, and how changing hardware and user requirements might reshape them in the future. Enrollment limited to 25. WR

**CPSC 183a, Law, Technology, and Culture** Brad Rosen

An exploration of the myriad ways in which law and technology intersect, with a special focus on the role of cyberspace. Topics include digital copyright, free speech, privacy and anonymity, information security, innovation, online communities, the impact of

technology on society, and emerging trends. No previous experience with computers or law necessary. SO

**\* CPSC 185b, Control, Privacy, and Technology** Brad Rosen

The evolution of various legal doctrines with and around technological development. Topics include criminal law, privacy, search and seizure, digital rights, and the implications of technologically permitted methods of control on the law. Special attention to case law and policy. After CPSC 183. WR, SO

**CPSC 201a or b, Introduction to Computer Science** Staff

Introduction to the concepts, techniques, and applications of computer science. Topics include computer systems (the design of computers and their languages); theoretical foundations of computing (computability, complexity, algorithm design); and artificial intelligence (the organization of knowledge and its representation for efficient search). Examples stress the importance of different problem-solving methods. After CPSC 112 or equivalent. QR

Math: Stat/Applied Math

**CPSC 202a, Mathematical Tools for Computer Science** Dana Angluin

Introduction to formal methods for reasoning and to mathematical techniques basic to computer science. Topics include propositional logic, discrete mathematics, and linear algebra. Emphasis on applications to computer science: recurrences, sorting, graph traversal, Gaussian elimination. QR

**CPSC 223b, Data Structures and Programming Techniques** James Aspnes

Topics include programming in C; data structures (arrays, stacks, queues, lists, trees, heaps, graphs); sorting and searching; storage allocation and management; data abstraction; programming style; testing and debugging; writing efficient programs. After CPSC 201 or equivalent. QR RP

**\* CPSC 290a or b, Directed Research** James Aspnes

Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. May be taken more than once for credit.

**MATH 244a / AMTH 244a, Discrete Mathematics** Nathan Kaplan

Basic concepts and results in discrete mathematics: graphs, trees, connectivity, Ramsey theorem, enumeration, binomial coefficients, Stirling numbers. Properties of finite set systems. Recommended preparation: MATH 115 or equivalent. QR

Math: Stat/Applied Math

Math: Algebra/Number Theory

## Intermediate Courses

**CPSC 323a, Introduction to Systems Programming and Computer Organization**

Stanley Eisenstat

Machine architecture and computer organization, systems programming in a high-level language, issues in operating systems, software engineering, prototyping in scripting languages. After CPSC 223. QR RP

**CPSC 365b, Design and Analysis of Algorithms** Daniel Spielman

Paradigms for problem solving: divide and conquer, recursion, greedy algorithms, dynamic programming, randomized and probabilistic algorithms. Techniques for analyzing the efficiency of algorithms and designing efficient algorithms and data



structures. Algorithms for graph theoretic problems, network flows, and numerical linear algebra. Provides algorithmic background essential to further study of computer science. After CPSC 202 and 223. QR

Math: Stat/Applied Math

## Advanced Courses

### \* CPSC 421b, Compilers and Interpreters Zhong Shao

Compiler organization and implementation: lexical analysis, formal syntax specification, parsing techniques, execution environment, storage management, code generation and optimization, procedure linkage and address binding. The effect of language-design decisions on compiler construction. After CPSC 323. QR

### CPSC 422a, Operating Systems Staff

The design and implementation of operating systems. Topics include synchronization, deadlock, process management, storage management, file systems, security, protection, and networking. After CPSC 323. QR

### [ CPSC 423, Principles of Operating Systems ]

### CPSC 424a, Parallel Programming Techniques Andrew Sherman

Practical introduction to parallel programming, emphasizing techniques and algorithms suitable for scientific and engineering computations. Aspects of processor and machine architecture. Techniques such as multithreading, message passing, and data parallel computing using graphics processing units. Performance measurement, tuning, and debugging of parallel programs. Parallel file systems and I/O. After CPSC 223 and MATH 222 or 225, or equivalents. QR

### CPSC 426a, Building Decentralized Systems Bryan Ford

Challenges and techniques for building decentralized computing systems, in which many networked computers need to cooperate reliably despite failures and without assuming centralized management. Topics include decentralized storage systems, mobile and remote execution, hosting untrusted code, fault tolerance, naming, capabilities, information flow control, distributed shared memory, distributed hash tables, content distribution, and practical uses of cryptography. After CPSC 323. QR

### CPSC 428a, Language-Based Security Zhong Shao

Basic design and implementation of language-based approaches for increasing the security and reliability of systems software. Topics include proof-carrying code, certifying compilation, typed assembly languages, runtime checking and monitoring, high-confidence embedded systems and drivers, and language support for verification of safety and liveness properties. After CPSC 202, 323, and MATH 222, or equivalents. QR

### [ CPSC 430, Formal Semantics ]

### CPSC 431b, Computer Music: Algorithmic and Heuristic Composition Paul Hudak

Study of the theoretical and practical fundamentals of computer-generated music, with a focus on high-level representations of music, algorithmic and heuristic composition, and programming languages for computer music generation. Theoretical concepts are supplemented with pragmatic issues expressed in a high-level programming language. Ability to read music is assumed. After CPSC 202 and 223. QR

## [ CPSC 432, Computer Music: Sound Representation and Synthesis ]

## [ CPSC 433, Computer Networks ]

## [ CPSC 437, Introduction to Databases ]

**CPSC 438b, Database System Implementation and Architectures** Daniel Abadi  
A study of systems programming techniques, with a focus on database systems. In the first half of the term, students analyze the design of a traditional DBMS and build components of a DBMS prototype, e.g., a catalog-manager, a buffer-manager, and a query execution engine. In the second half, students examine nontraditional architectures such as parallel databases, data warehouses, stream databases, and Web databases. After or concurrently with CPSC 202 and 323. QR

**CPSC 439b, Software Engineering** Ruzica Piskac  
Introduction to fundamental concepts in software engineering and to the development and maintenance of large, robust software systems. The process of collecting requirements and writing specifications; project planning and system design; methods for increasing software reliability, including delta debugging and automatic test-case generation; type systems, static analysis, and model checking. Students build software in teams. After CPSC 323. QR RP

**CPSC 440b, Numerical Computation** Vladimir Rokhlin  
Algorithms for numerical problems in the physical, biological, and social sciences: solution of linear and nonlinear systems of equations, interpolation and approximation of functions, numerical differentiation and integration, optimization. After CPSC 112 or an equivalent introductory programming course; MATH 120; and MATH 222 or 225 or CPSC 202. QR  
Math: Stat/Applied Math

**CPSC 445a, Introduction to Data Mining** Vladimir Rokhlin  
A study of algorithms and systems that allow computers to find patterns and regularities in databases, to perform prediction and forecasting, and to improve their performance generally through interaction with data. After CPSC 202, 223, and MATH 222, or equivalents. QR

## [ CPSC 465, Theory of Distributed Systems ]

**CPSC 467a, Cryptography and Computer Security** Michael Fischer  
A survey of such private and public key cryptographic techniques as DES, RSA, and zero-knowledge proofs, and their application to problems of maintaining privacy and security in computer networks. Focus on technology, with consideration of such societal issues as balancing individual privacy concerns against the needs of law enforcement, vulnerability of societal institutions to electronic attack, export regulations and international competitiveness, and development of secure information systems. Some programming may be required. After CPSC 202 and 223. QR

**CPSC 468b, Computational Complexity** Joan Feigenbaum  
Introduction to the theory of computational complexity. Basic complexity classes, including polynomial time, nondeterministic polynomial time, probabilistic polynomial time, polynomial space, logarithmic space, and nondeterministic logarithmic space. The roles of reductions, completeness, randomness, and interaction in the formal study of computation. After CPSC 365 or with permission of instructor. QR

**CPSC 469a, Randomized Algorithms** James Aspnes

A study of randomized algorithms from several areas: graph algorithms, algorithms in algebra, approximate counting, probabilistically checkable proofs, and matrix algorithms. Topics include an introduction to tools from probability theory, including some inequalities such as Chernoff bounds. After CPSC 365; a solid background in probability is desirable. QR

**CPSC 470a, Artificial Intelligence** Drew McDermott

Introduction to artificial intelligence research, focusing on reasoning and perception. Topics include knowledge representation, predicate calculus, temporal reasoning, vision, robotics, planning, and learning. After CPSC 201 and 202. QR

**CPSC 472b, Intelligent Robotics** Brian Scassellati

Introduction to the construction of intelligent, autonomous systems. Sensory-motor coordination and task-based perception. Implementation techniques for behavior selection and arbitration, including behavior-based design, evolutionary design, dynamical systems, and hybrid deliberative-reactive systems. Situated learning and adaptive behavior. After CPSC 201 and 202 or equivalents. May not be taken after CPSC 473.

**[ CPSC 473, Intelligent Robotics Laboratory ]****CPSC 475a / BENG 475a, Computational Vision and Biological Perception**

Steven Zucker

An overview of computational vision with a biological emphasis. Suitable as an introduction to biological perception for computer science and engineering students, as well as an introduction to computational vision for mathematics, psychology, and physiology students. After CPSC 112 and MATH 120, or with permission of instructor. QR, SC RP

**CPSC 476b / BENG 476b, Advanced Computational Vision** Steven Zucker

Advanced view of vision from a mathematical, computational, and neurophysiological perspective. Emphasis on differential geometry, machine learning, visual psychophysics, and advanced neurophysiology. Topics include perceptual organization, shading, color and texture analysis, and shape description and representation. After CPSC 475. QR, SC

**CPSC 478b, Computer Graphics** Julie Dorsey

Introduction to the basic concepts of two- and three-dimensional computer graphics. Topics include affine and projective transformations, clipping and windowing, visual perception, scene modeling and animation, algorithms for visible surface determination, reflection models, illumination algorithms, and color theory. After CPSC 202 and 223. QR

**[ CPSC 479, Advanced Topics in Computer Graphics ]****\* CPSC 480a or b, Directed Reading** James Aspnes

Individual study for qualified students who wish to investigate an area of computer science not covered in regular courses. A student must be sponsored by a faculty member who sets the requirements and meets regularly with the student. Requires a written plan of study approved by the faculty adviser and the director of undergraduate studies. May be taken more than once for credit.

**\* CPSC 490a or b, Special Projects** James Aspnes

Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. The student must submit a written report about the results of the project. May be taken more than once for credit.

## Computer Science and Mathematics

Directors of undergraduate studies: James Aspnes (Computer Science), 401 AKW, 432-1232, james.aspnes@yale.edu; Andrew Casson (Mathematics), 216 LOM, 432-7056, andrew.casson@yale.edu

Computer Science and Mathematics is an interdepartmental major for students who are interested in computational mathematics, the use of computers in mathematics, mathematical aspects of algorithm design and analysis, and theoretical foundations of computing.

The major requires fourteen term courses as well as a senior project. Six of the fourteen courses must be in computer science: CPSC 201, 223, 323, and 365; one from CPSC 440, 462, 465, 468, or 469; and one additional advanced term course other than CPSC 480 or 490. The remaining eight courses must be in mathematics: MATH 120, either 222 or 225, 244, and five additional term courses numbered above MATH 200 other than MATH 470. MATH 230, 231 may replace (but do not count in addition to) MATH 120 and 222 or 225.

The senior requirement is a project or an essay on a topic acceptable to both departments. An oral report on the mathematical aspects of the project must be presented to the Mathematics faculty.

The entire program of each student majoring in Computer Science and Mathematics must be approved by the director of undergraduate studies in each department. Courses taken Credit/D/Fail may not be counted toward the major.

### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 14 term courses (not incl senior req)

**Specific courses required** CPSC 201, 223, 323, 365; one from CPSC 440, 462, 465, 468, or 469; MATH 120, 222 or 225, 244

**Distribution of courses** 5 addtl courses in math numbered above 200 (may not be MATH 470); 1 addtl advanced course in comp sci (may not be CPSC 480 or 490)

**Substitution permitted** MATH 230, 231 for MATH 120 and 222 or 225

**Senior requirement** Senior project or senior essay on topic acceptable to Comp Sci and Math depts; oral report to Math dept on mathematical aspects of project

## Computer Science and Psychology

Directors of undergraduate studies: James Aspnes (Computer Science), 401 AKW, 432-1232, james.aspnes@yale.edu; Laurie Santos (Psychology), 213 SSS, 432-4524, psychdus@yale.edu

Computer Science and Psychology is an interdepartmental major designed for students interested in integrating work in these two fields. Each area provides tools and theories

that can be applied to problems in the other. Examples of this interaction include cognitive science, artificial intelligence, and biological perception.

The prerequisite for the major is PSYC 110, from which students who have scored 5 on the Advanced Placement test in Psychology are exempt. Beyond the prerequisite, the major requires fourteen term courses as well as a senior project.

Eight of the fourteen courses must be in computer science: CPSC 201, 202, 223, 323, 365, and three advanced computer science courses in artificial intelligence (e.g., CPSC 470, 471, 473, or 475). MATH 244 may substitute for CPSC 202. CPSC 480 and 490 may not be counted as one of these courses.

The remaining six courses must be in psychology, including PSYC 200, at least one from PSYC 210–299, at least two Psychology courses from the social science point of view, and at least one course in cognitive psychology or cognitive science listed in Psychology. PSYC 490, 491, 492, and 493 may not be counted as one of these courses. For the Class of 2017 and subsequent classes, at least one of the two psychology courses from the social science point of view must be designated as Core in the course listings.

A second course in cognitive psychology or cognitive science may substitute for one of the courses in artificial intelligence. An additional course in psychology and an examination arranged with the instructor of PSYC 200 may substitute for PSYC 200.

**Senior requirement** Students must take CPSC 490 or PSYC 492 or 493, and the project must be approved by the director of undergraduate studies in each department.

**Approval of program** The entire program of each student majoring in Computer Science and Psychology must be approved by the director of undergraduate studies in each department. No course in Computer Science taken Credit/D/Fail may be counted toward the major; no more than one course in Psychology taken Credit/D/Fail may be counted toward the major. For the Class of 2017 and subsequent classes, no 200-level course in Psychology taken Credit/D/Fail may be counted.

## REQUIREMENTS OF THE MAJOR

**Prerequisite** PSYC 110

**Number of courses** 14 term courses beyond prereq (not incl senior project)

**Specific courses required** CPSC 201, 202, 223, 323, 365; PSYC 200

**Distribution of courses** 8 courses in Comp Sci, with 3 advanced AI courses; 6 courses in Psych, with at least 1 from PSYC 210–299 and at least 1 in cognitive psych or cognitive science listed in Psych; *Class of 2016 and previous classes*—at least 2 courses in Psych from social science point of view; *Class of 2017 and subsequent classes*—at least 2 courses in Psych from social science point of view, at least 1 designated Core

**Substitution permitted** For CPSC 202, MATH 244; for 1 course in AI, 1 addtl course in cognitive psych or cognitive science; for PSYC 200, 1 addtl course in Psych and exam arranged with instructor

**Senior requirement** CPSC 490 or PSYC 492 or 493 with project approved by DUS in each dept

## Computing and the Arts

Director of undergraduate studies: Julie Dorsey (Computer Science), 507 AKW, 432-4249, julie.dorsey@yale.edu

Computing and the Arts is an interdepartmental major designed for students who wish to integrate work in computing with work in one of the arts disciplines: Art, History of Art, Music, or Theater Studies.

For students with a computing perspective, issues in these disciplines present interesting and substantive problems: how musicians use computers to compose; the limitations of current software tools used by artists; the types of analyses done by art historians; challenges in designing and using virtual sets in the theater; ways that virtual worlds might help to envision new forms of artistic expression; lessons that can be learned from trying to create a robotic conductor or performer.

For students with an artistic perspective, computing methods offer a systematic approach to achieving their vision. A foundation in computer science allows artists to understand existing computing tools more comprehensively and to use them more effectively. Furthermore, it gives them insight into what fundamentally can and cannot be done with computers, so they can anticipate the future development of new tools for computing in their field.

**Prerequisites** The prerequisite for all students in the major is CPSC 112, which should be taken during the freshman year. Additional prerequisites for the Art track are ART 111 and 114. There are no additional prerequisites for the History of Art track. An additional prerequisite for the Music track is MUSI 210, as determined by the music theory placement test. (Students who do not place into or out of MUSI 210 may need to take a lower-level course first.) Additional prerequisites for the Theater Studies track are THST 110 and 111. There is no required favorable review of studio work for admission to the major in any track.

**The major** Twelve term courses are required beyond the prerequisites, not including the two-term senior project. Six of the courses must be in Computer Science, including CPSC 201, 202, and 223. Students are advised to complete CPSC 202 and 223 by the end of the sophomore year. MATH 244 may be substituted for CPSC 202.

The six remaining courses are selected from one of the arts disciplines. Students choose a track in art, history of art, music, or theater studies. All requirements for a single track must be satisfied, as specified below.

The Art track requires the following courses in addition to the Computer Science courses listed above: (1) two 100-level courses beyond ART 111 and 114, such as ART 132, 138, or 145; (2) two courses in Art at the 200 or 300 level; (3) ART 395; (4) one course in Art at the 400 level; (5) two courses selected from CPSC 475, 478, and 479; (6) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

The History of Art track requires the following courses in addition to the Computer Science courses listed above: (1) one introductory History of Art course: HSAR 112, 142, or 143; (2) two History of Art courses at the 200, 300, or 400 level (the courses must represent two different areas as defined in the History of Art program description); (3) one studio art course (students may need to take a prerequisite course in Art to prepare for the studio course); (4) HSAR 401; (5) one 400-level seminar in History of Art; (6) two courses selected from CPSC 437, 475, 478, or 479, one of which

must be CPSC 478 or 479; (7) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

The Music track requires the following courses in addition to the Computer Science courses listed above: (1) MUSI 325; (2) five term courses chosen from MUSI 312, 313, 343, 412, 413, 471, and 472; (3) CPSC 431; (4) CPSC 432; (5) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

The Theater Studies track requires the following courses in addition to the Computer Science courses listed above: (1) THST 210; (2) three courses in dramatic literature or theater history; (3) two upper-level Theater Studies production seminars in design, directing, or playwriting; (4) CPSC 431 or 432; (5) CPSC 478 or 479; (6) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

**Senior requirement** The senior project requires two terms: one term of CPAR 491, and one term of ART 495, HSAR 499, MUSI 490 or 491, or THST 471 or 491, depending on the track chosen. The project must be approved by the director of undergraduate studies and be acceptable to both departments. Students must submit a written report, including an electronic abstract and Web page(s).

**Approval of program** The entire program of each student majoring in Computing and the Arts must be approved by the director of undergraduate studies. Courses taken Credit/D/Fail may not be counted toward the major.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** *All tracks*—CPSC 112; *Art track*—ART 111, 114; *Music track*—MUSI 210; *Theater Studies track*—THST 110, 111

**Number of courses** 12 term courses beyond prereqs (not incl senior project)

**Specific courses required** *All tracks*—CPSC 201, 202, 223; *Art track*—ART 395, 2 from CPSC 475, 478, 479; *History of Art track*—2 from CPSC 437, 475, 478, 479, including 1 of CPSC 478, 479; 1 from HSAR 112, 142, 143; HSAR 401; *Music track*—CPSC 431, 432; MUSI 325; *Theater Studies track*—CPSC 431 or 432; CPSC 478 or 479; THST 210

**Distribution of courses** *All tracks*—6 courses in Comp Sci, incl 1 addtl intermediate or advanced course beyond specific reqs (excluding CPSC 490); *Art track*—2 courses in Art at 100 level (excluding prereqs), 2 at 200 or 300 level, and 1 at 400 level (in addition to senior req); *History of Art track*—2 courses in different areas of History of Art at 200, 300, or 400 level; one 400-level sem in History of Art; 1 studio art course; *Music track*—5 courses from MUSI 312, 313, 343, 412, 413, 471, 472; *Theater Studies track*—3 courses in dramatic lit or theater history; 2 production sems, as specified

**Substitution permitted** MATH 244 for CPSC 202

**Senior requirement** *All tracks*—Two-term senior project approved by DUS; *Art track*—Senior project completed in CPAR 491 and ART 495; *History of Art track*—Senior project completed in CPAR 491 and HSAR 499; *Music track*—Senior project completed in CPAR 491 and MUSI 490 or 491; *Theater Studies track*—Senior project completed in CPAR 491 and THST 471 or 491

## Courses

### \* **CPAR 291a or b, Special Projects** Julie Dorsey

Individual research project in computing and the arts. Requires a faculty supervisor and permission of the director of undergraduate studies. May be taken more than once for credit.

### \* **CPAR 491a or b, Senior Project in Computing and the Arts** Julie Dorsey

Individual research project for majors in Computing and the Arts. Requires two faculty supervisors, one from Computer Science and one from the department in the chosen track. Requires permission of the director of undergraduate studies. The student must present both a verbal and a written report describing the results of the project. May be taken more than once for credit.

## DeVane Lecture Course

### **DEVN 196a / E&EB 190a / HUMS 289a, The Evolution of Beauty** Richard Prum

Aesthetics and beauty explored from the perspectives of evolutionary biology, zoology, human biology, arts, and culture. Survey of the mechanisms and processes of aesthetic evolution in animals and plants; the nature of sexual conflict over reproduction; the role of aesthetic preferences in the evolution of sexual autonomy; human aesthetics and human art.

## Directed Studies

Director of undergraduate studies: Kathryn Slanski, Rm. 321, 53 Wall St., 432-6630, [kathryn.slanski@yale.edu](mailto:kathryn.slanski@yale.edu); chair of Humanities: R. Howard Bloch, Rm. 212, 53 Wall St., 432-1313, [howard.bloch@yale.edu](mailto:howard.bloch@yale.edu); [directedstudies.yale.edu](http://directedstudies.yale.edu)

Directed Studies, a selective program for freshmen, is an interdisciplinary study of Western civilization. One hundred twenty-five students are accepted each year. The Literature, Philosophy, and History and Politics tracks of Directed Studies together comprise one coherent program of study, and students must enroll in all three tracks simultaneously. Successful completion of the fall-term Directed Studies courses is a prerequisite to enrolling in the spring-term courses.

Each course meets weekly for one lecture and two seminars; seminars have eighteen students and one faculty member. The regular lectures and seminars are complemented by a series of colloquia. Distinguished members of the faculty are invited to speak on major issues arising from the work in the program, on related disciplines not included in the program, and on the relationship between Western civilization and the non-Western world. Colloquium topics in recent years have included the use of the humanities, the Christian reception of Aristotle, and ancient art and property rights. Directed Studies fulfills the following distributional requirements: two course credits in the humanities and arts, two course credits in the social sciences, and two course credits in writing. The program serves as a strong foundation for all majors in Yale College, including those in the sciences.

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## Courses

### \* DRST 001a and DRST 002b, Directed Studies: Literature Staff

An examination of major literary works with an aim of understanding how a tradition develops. In the fall term, works and authors include Homer, Aeschylus, Sophocles, Virgil, the Bible, and Dante. In the spring term, authors vary somewhat from year to year and include Petrarch, Cervantes, Shakespeare, Milton, Wordsworth, Goethe, Tolstoy, Proust, and Eliot. WR, HU

### \* DRST 003a and DRST 004b, Directed Studies: Philosophy Staff

An examination of major figures in the history of Western philosophy with an aim of discerning characteristic philosophical problems and their interconnections. Emphasis on Plato and Aristotle in the fall term. In the spring term, modern philosophers include Descartes, Berkeley, Hume, Kant, and Nietzsche. WR, HU

### \* DRST 005a and DRST 006b, Directed Studies: Historical and Political Thought Staff

A study of works of primary importance to political thought and intellectual history. Focus on the role of ideas in shaping events, institutions, and the fate of the individual. In the fall term, Herodotus, Thucydides, Plato, Aristotle, Augustine, and Aquinas. In the spring term, Machiavelli, Hobbes, Locke, Rousseau, Burke, Tocqueville, Emerson, Marx, Nietzsche, and Arendt. SO

## East Asian Languages and Literatures

Director of undergraduate studies: Seth Jacobowitz, 305 HGS, 432-9840,  
seth.jacobowitz@yale.edu; eall.yale.edu

### FACULTY OF THE DEPARTMENT OF EAST ASIAN LANGUAGES AND LITERATURES

**Professors** Kang-i Sun Chang (*Chair* [Sp]), Aaron Gerow (*East Asian Languages & Literatures, Film Studies*), Edward Kamens, Tina Lu (*Chair* [F]), Jing Tsu

**Assistant Professors** William Fleming (*East Asian Languages & Literatures, Theater Studies*), Michael Hunter, Seth Jacobowitz

**Senior Lecturer** Pauline Lin

**Senior Lectors II** Seungja Choi, Ling Mu

**Senior Lectors** Hsiu-hsien Chan, Min Chen, Koichi Hiroe, Angela Lee-Smith, Rongzhen Li, Ninghui Liang, Fan Liu, Yoshiko Maruyama, Michiaki Murata, Hiroyo Nishimura, Yu-lin Wang Saussy, Masahiko Seto, Jianhua Shen, Mari Stever, Wei Su, Haiwen Wang, Peisong Xu, William Zhou

**Lectors** Aoi Saito, Chuanmei Sun, Shucheng Zhang

**Affiliated Faculty** Chloe Starr (*Divinity School*)

The major in East Asian Languages and Literatures provides an intellectually focused and rigorous immersion in the East Asian humanities. The department's courses reflect the breadth, depth, and variety of East Asian textual traditions, premodern through modern, including film and theater. The major is focused on the analysis of literature, culture, and thought, and is built on a solid foundation of language study. Students

elect either the Chinese or the Japanese track, but are encouraged to take courses in both tracks and to become familiar with aspects of East Asian literary culture that transcend geographic parameters.

**Course numbering** Language courses use the subject codes CHNS, JAPN, or KREN. Courses with the subject code EALL are content courses whose focus is critical and humanistic; those numbered 200 to 299 are introductory, and those numbered 300 to 399 are advanced. Courses numbered EALL 001 to 099 are freshman seminars on East Asian literature, film, and humanities.

**Courses for nonmajors** All courses offered by the Department of East Asian Languages and Literatures are open to nonmajors.

**Prerequisite** Candidates for the major must complete CHNS 140 or JAPN 140 or the equivalent.

**The major for the Class of 2015** Students in the Class of 2015 may fulfill the requirements of the major in Chinese or the major in Japanese that were in place when they entered the major, as described in previous editions of this bulletin (<http://www.yale.edu/printer/bulletin/archivepdf/files/YCPS>). Alternatively, they may fulfill the requirements of the major in East Asian Languages and Literatures, as described below for the Class of 2016 and subsequent classes.

**Requirements of the major for the Class of 2016 and subsequent classes** The major consists of at least eleven term courses beyond the prerequisite. Students must take two terms of advanced modern Chinese (CHNS 150 and 151 or equivalents) or advanced Japanese (JAPN 150 and 151 or equivalents), as well as two terms of literary Chinese or Japanese (CHNS 170 and 171, or JAPN 170 and 171). Students also take a survey course in Chinese, Japanese, or East Asian history and culture, preferably early in their studies. Three courses are required in literature in translation, taught in English, selected from EALL 200–399; one must be focused primarily on premodern content. These three may include courses on theater and film. In addition, two advanced courses with readings in literary or modern Chinese and/or Japanese are required.

**Senior requirement** Students prepare a one-term senior essay in EALL 491 or a yearlong senior essay in EALL 492 and 493. Those who elect a yearlong essay effectively commit to taking twelve term courses in the major, because the second term of the essay may not be substituted for any of the eleven required courses.

**Credit/D/Fail** A maximum of one course taken Credit/D/Fail may be counted toward the requirements of the major, with permission of the director of undergraduate studies.

**Placement examination** Students who enroll in the department's language courses for the first time but who have studied Chinese, Japanese, or Korean elsewhere, and students who have skills in one of these languages because of family background, must take a placement examination at the beginning of the academic year. The times and places of the examinations are listed on the departmental Web site (<http://eall.yale.edu/academics/language-programs>) in August. The Chinese and Japanese examinations have online components accessed through the same site. Students of Japanese, Chinese, and Korean returning from programs abroad must take a placement examination unless the coursework was completed at an institution preapproved by

the Richard U. Light Fellowship program. For questions, consult with the director of undergraduate studies.

**Study abroad** Students are encouraged to study abroad. Interested students should consult with the director of undergraduate studies and with the office of the Richard U. Light Fellowship (<http://www.yale.edu/iefp/light/overview.html>) to apply for support for programs in China, Japan, and Korea.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** CHNS 140 or JAPN 140 or equivalent

**Number of courses** 11 courses (incl one-term senior essay) or 12 courses (incl yearlong senior essay) beyond prereq

**Specific courses required** *Chinese track*—CHNS 150, 151, 170, 171, or equivalents;  
*Japanese track*—JAPN 150, 151, 170, 171, or equivalents

**Distribution of courses** 1 course in Chinese, Japanese, or East Asian hist and culture;  
3 courses in lit in translation numbered EALL 200–399, one of them premodern; 2 adv courses with readings in Chinese and/or Japanese

**Senior requirement** One-term (EALL 491) or yearlong (EALL 492, 493) senior essay

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## East Asian Humanities

### **EALL 200a / HUMS 432a, The Chinese Tradition** Tina Lu

An introduction to the literature, culture, and thought of premodern China, from the beginnings of the written record to the turn of the twentieth century. Close study of textual and visual primary sources, with attention to their historical and cultural backdrops. No knowledge of Chinese required. HU

### \* **EALL 211a / WGSS 405a, Women and Literature in Traditional China**

Kang-i Sun Chang

A study of major women writers in traditional China, as well as representations of women by male authors. The power of women's writing; women and material culture; women in exile; courtesans; Taoist and Buddhist nuns; widow poets; cross-dressing women; the female body and its metaphors; footbinding; notions of love and death; the aesthetics of illness; women and revolution; poetry clubs; the function of memory in women's literature; problems of gender and genre. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 201. HU TR

### \* **EALL 236a / HUMS 435a / LITR 181a, Japanese Poetry and Poetics**

Edward Kamens and Staff

Core concepts and traditions of classical Japanese poetry explored through the medium of translation. Readings from anthologies and treatises of the ninth through early twentieth centuries. Attention to recent critical studies in transcultural poetic theory. Inspection and discussion of related artifacts in the Beinecke Rare Book and Manuscript Library and the Yale University Art Gallery. Readings and discussion in English. HU

### **EALL 248b / LITR 254b, Modern Chinese Literature** Jing Tsu

An introduction to modern Chinese literature. Themes include cultural go-betweens; sensations in the body; sexuality; diaspora, translation, and nationalism; globalization and homeland; and everyday life. No knowledge of Chinese required. HU

**EALL 255b, Japanese Modernism** Seth Jacobowitz

Japanese literature and art from the 1920s through the 1940s. The avant-garde and mass culture; popular genre fiction; the advent of new media technologies and techniques; effects of Japanese imperialism, militarism, and fascism on cultural production; experimental writers and artists and their resistance to, or complicity with, the state. HU

**\* EALL 275b / FILM 389b / LITR 365b, Crime in Japanese Film and Fiction**

Aaron Gerow

The depiction of crime in Japanese film and fiction, with a focus on the detective and gangster genres. Social, historical, and aesthetic implications, as well as differences from Euro-American and Asian crime films. HU

**\* EALL 300b, Sinological Methods** Pauline Lin

A research course in Chinese studies, designed for students with background in modern and literary Chinese. Exploration and evaluation of the wealth of primary sources and research tools available in Chinese. For native speakers of Chinese, introduction to the secondary literature in English and instruction in writing professionally in English on topics about China. Topics include the compilation and development of Chinese bibliographies; bibliophiles' notes; editions, censorship, and textual variation and reliability; specialized dictionaries; maps and geographical gazetteers; genealogies and biographical sources; archaeological and visual materials; and major Chinese encyclopedias and compendia. Prerequisite: CHNS 171 or equivalent. Formerly CHNS 202. HU

**\* EALL 303a, Readings in Classical Chinese Poetry** Kang-i Sun Chang

Fundamentals of classical Chinese poetry and poetics. Readings vary from year to year; topics include poetry and history, intertextuality, and poetic reception. Readings in Chinese; discussion in English. Prerequisite: CHNS 171 or equivalent, or permission of instructor. Formerly CHNS 303. HU

**\* EALL 325b, Chinese Poetic Form, 1490–1990** Kang-i Sun Chang

Development of the classical Chinese poetic form by modern Chinese poets. The appeal and aesthetic concept of the classical form since the revivalist movement of the late fifteenth century. Emphasis on close critical reading, with attention to cultural and political contexts. Readings in Chinese; discussion in English. Prerequisite: a literary Chinese course or permission of instructor. HU

**\* EALL 357a, Meiji Literature and Visual Culture** Seth Jacobowitz

Introduction to the literature and visual culture of Meiji Japan (1868–1912), including novels, poetry, calligraphy, woodblock prints, painting, photography, and cinema. The relationship between theories and practices of fine art and literature; changes in word and image relations; transformations from woodblock to movable-type print culture; the invention of photography and early forms of cinematic practice. No knowledge of Japanese required. HU TR

**\* EALL 470a and EALL 471b, Independent Tutorial** Staff

For students with advanced Chinese, Japanese, or Korean language skills who wish to engage in concentrated reading and research on literary works in a manner not otherwise offered in courses. The work must be supervised by a specialist and must terminate in a term paper or its equivalent. Ordinarily only one term may be offered toward the major or for credit toward the degree. Permission to enroll requires

submission of a detailed project proposal by the end of the first week of classes and its approval by the director of undergraduate studies.

\* **EALL 491a or b, Senior Essay** Staff

Preparation of a one-term senior essay under faculty supervision.

\* **EALL 492a and EALL 493b, Yearlong Senior Essay** Staff

Preparation of a two-term senior essay under faculty supervision. Credit for EALL 492 only on completion of EALL 493.

## Chinese

\* **CHNS 110a, Elementary Modern Chinese I**

Jianhua Shen, Rongzhen Li, Min Chen, Yu-Lin Wang-Saussy, and Shucheng Zhang  
Intended for students with no background in Chinese. An intensive course with emphasis on spoken language and drills. Pronunciation, grammatical analysis, conversation practice, and introduction to reading and writing Chinese characters. Credit only on completion of CHNS 120. L1 RP 1½ Course cr

\* **CHNS 120b, Elementary Modern Chinese II**

Jianhua Shen, Rongzhen Li, Min Chen, Yu-Lin Wang-Saussy, and Shucheng Zhang  
Continuation of CHNS 110. After CHNS 110 or equivalent. L2 RP 1½ Course cr

\* **CHNS 130a, Intermediate Modern Chinese I**

Ling Mu, Ninghui Liang, and Chuanmei Sun  
An intermediate course that continues intensive training in listening, speaking, reading, and writing and consolidates achievements from the first year of study. Students improve oral fluency, study more complex grammatical structures, and enlarge both reading and writing vocabulary. After CHNS 120 or equivalent. L3 RP 1½ Course cr

\* **CHNS 132a, Elementary Modern Chinese for Advanced Learners I** Fan Liu

First level of the advanced learner sequence, intended for students with some aural proficiency but limited ability in reading and writing Chinese. Training in listening and speaking, with emphasis on reading and writing. Placement confirmed by placement test and by instructor. L3 RP 1½ Course cr

\* **CHNS 140b, Intermediate Modern Chinese II**

Ling Mu, Ninghui Liang, and Chuanmei Sun  
Continuation of CHNS 130. To be followed by CHNS 150. After CHNS 130 or equivalent. L4 RP 1½ Course cr

\* **CHNS 142b, Elementary Modern Chinese for Advanced Learners II** Fan Liu

Continuation of CHNS 132. After CHNS 132 or equivalent. L4 RP 1½ Course cr

\* **CHNS 150a, Advanced Modern Chinese I** Haiwen Wang and Hsiu-hsien Chan

Third level of the standard foundational sequence of modern Chinese, with study in speaking, listening, reading, and writing. Use of audiovisual materials, oral presentations, skits, and longer and more frequent writing assignments to assimilate more sophisticated grammatical structures. Further introduction to a wide variety of written forms and styles. Use of both traditional and simplified forms of Chinese characters. After CHNS 140 or equivalent. L5 1½ Course cr

\* **CHNS 151b, Advanced Modern Chinese II** Haiwen Wang and Hsiu-hsien Chan

Continuation of CHNS 150. After CHNS 150 or equivalent. L5 1½ Course cr

\* **CHNS 152a and CHNS 153b, Intermediate Modern Chinese for Advanced Learners**

Peisong Xu

The second level of the advanced learner sequence. Intended for students with intermediate to advanced oral proficiency and high elementary reading and writing proficiency. Students receive intensive training in listening, speaking, reading, and writing, supplemented by audio and video materials. The objective of the course is to balance these four skills and work toward attaining an advanced level in all of them. After CHNS 142 or equivalent. L5 RP 1½ Course cr per term

\* **CHNS 154a, Advanced Modern Chinese III** William Zhou

Fourth level of the standard foundational sequence of modern Chinese, with study in speaking, listening, reading, and writing. Readings in a wide range of subjects form the basis of discussion and other activities. Students consolidate their skills, especially speaking proficiency, at an advanced level. Materials use both simplified and traditional characters. After CHNS 151 or equivalent. L5

\* **CHNS 155b, Advanced Modern Chinese IV** William Zhou

Continuation of CHNS 154. After CHNS 154 or equivalent. L5

\* **CHNS 162a and CHNS 163b, Advanced Modern Chinese for Advanced Learners**

Wei Su

Third level of the advanced learner sequence in Chinese. Intended for students with advanced speaking and listening skills (able to conduct conversations fluently) and with high intermediate reading and writing skills (able to write 1,000–1,200 characters). Further readings on contemporary life in China and Taiwan, supplemented with authentic video materials. Class discussion, presentations, and regular written assignments. Texts in simplified characters with vocabulary in both simplified and traditional characters. After CHNS 153 or equivalent. L5

\* **CHNS 164a, Readings in Contemporary Chinese Fiction** Wei Su

Selected readings in Chinese fiction of the 1980s and 1990s. Development of advanced language skills in reading, speaking, and writing for students with an interest in literature and literary criticism. After CHNS 155, 162, or equivalent. L5

\* **CHNS 165b, Readings in Modern Chinese Fiction** Wei Su

Reading and discussion of modern short stories, most written prior to 1949. Development of advanced language skills in reading, speaking, and writing for students with an interest in literature and literary criticism. After CHNS 155, 162, or equivalent.

\* **CHNS 166a and CHNS 167b, Chinese Media and Society** William Zhou

Advanced language course with a focus on speaking and writing skills. Issues in contemporary Chinese society explored through media forms such as newspapers, radio, television, and Internet blogs. After CHNS 155, 162, or equivalent. L5

\* **CHNS 168a and CHNS 169b, Chinese for Global Enterprises** Shucheng Zhang

Advanced language course with a focus on Chinese business terminology and discourse. Discussion of China's economic and management reforms, marketing, economic laws, business culture and customs, and economic relations with other countries. Case studies from international enterprises that have successfully entered the Chinese market. After CHNS 155, 162, or equivalent. L5 RP

**CHNS 170a, Introduction to Literary Chinese I** Pauline Lin

Reading and interpretation of texts in various styles of literary Chinese (*wenyan*), with attention to basic problems of syntax and literary style. After CHNS 151, 153, or equivalent. L5

**CHNS 171b, Introduction to Literary Chinese II** Pauline Lin

Continuation of CHNS 170. After CHNS 170. L5 RP

## Japanese

**\* JAPN 110a, Elementary Japanese I**

Hiroyo Nishimura, Michiaki Murata, Aoi Saito, and Mari Stever  
Introductory language course for students with no previous background in Japanese. Development of proficiency in listening, speaking, reading, and writing, including 50 hiragana, 50 katakana, and 75 kanji characters. Introduction to cultural aspects such as levels of politeness and group concepts. In-class drills in pronunciation and conversation. Individual tutorial sessions improve conversational skills. Credit only on completion of JAPN 120. L1 RP 1½ Course cr

**\* JAPN 120b, Elementary Japanese II**

Hiroyo Nishimura, Michiaki Murata, Aoi Saito, and Mari Stever  
Continuation of JAPN 110, with additional materials such as excerpts from television shows, anime, and songs. Introduction of 150 additional kanji. After JAPN 110 or equivalent. L2 RP 1½ Course cr

**\* JAPN 130a, Intermediate Japanese I** Yoshiko Maruyama and Masahiko Seto  
Continued development in both written and spoken Japanese. Aspects of Japanese culture, such as history, art, religion, and cuisine, explored through text, film, and animation. Online audio and visual aids facilitate listening, as well as the learning of grammar and kanji. Individual tutorial sessions improve conversational skills. After JAPN 120 or equivalent. L3 RP 1½ Course cr

**\* JAPN 140b, Intermediate Japanese II** Yoshiko Maruyama and Masahiko Seto  
Continuation of JAPN 130. After JAPN 130 or equivalent. L4 RP 1½ Course cr

**\* JAPN 150a, Advanced Japanese I** Mari Stever and Yoshiko Maruyama  
Advanced language course that further develops proficiency in reading, writing, speaking, and listening. Reading and discussion materials include works by Nobel Prize winners. Japanese anime and television dramas are used to enhance listening and to develop skills in culturally appropriate speech. Writing of essays, letters, and criticism solidifies grammar and style. Individual tutorial sessions improve conversational skills. After JAPN 140 or equivalent. L5 RP 1½ Course cr

**\* JAPN 151b, Advanced Japanese II** Mari Stever and Yoshiko Maruyama  
Continuation of JAPN 150. After JAPN 150 or equivalent. L5 RP 1½ Course cr

**\* JAPN 156a, Advanced Japanese III** Koichi Hiroe and Michiaki Murata  
Close reading of modern Japanese writing on current affairs, social science, history, and literature. Development of speaking and writing skills in academic settings, including formal speeches, interviews, discussions, letters, e-mail, and expository writing. Interviews of and discussions with native speakers on current issues. Individual tutorial sessions provide speaking practice. After JAPN 151 or equivalent. L5 RP 1½ Course cr

\* **JAPN 157b, Advanced Japanese IV** Koichi Hiroe and Michiaki Murata  
Continuation of JAPN 156. After JAPN 156 or equivalent. L5 1½ Course cr

\* **JAPN 162a, Reading Academic Japanese I** Masahiko Seto  
Close reading of major writings from the Meiji era to the present, including newspaper articles, scholarly works, fiction, and prose. Students gain a command of academic Japanese through comprehensive study of grammar in the context of culture. Individual tutorial sessions provide speaking practice. After JAPN 157 or equivalent; recommended to be taken after or concurrently with JAPN 170. L5

\* **JAPN 163b, Reading Academic Japanese II** Masahiko Seto  
Continuation of JAPN 162. After JAPN 162 or equivalent; recommended to be taken after JAPN 170. L5

\* **JAPN 164a and JAPN 165b, Academic and Professional Spoken Japanese**  
Koichi Hiroe

Advanced language course with a focus on the speaking skills necessary in academic and professional settings. Includes online interviews, discussions, and debates with native Japanese students and scholars on contemporary topics such as globalization, environment, technology, human rights, and cultural studies. Individual tutorial sessions provide speaking practice. After JAPN 163 or equivalent. L5

**JAPN 170a, Introduction to Literary Japanese** Edward Kamens  
Introduction to the grammar and style of the premodern literary language (*bungotai*) through a variety of texts. After JAPN 151 or equivalent. L5

\* **JAPN 171b, Readings in Literary Japanese** Riley Soles  
Close analytical reading of a selection of texts from the Nara through the Tokugawa periods: prose, poetry, and various genres. Introduction to *kanbun*. After JAPN 170 or equivalent. L5

## Korean

\* **KREN 110a, Elementary Korean I** Angela Lee-Smith  
A beginning course in modern Korean. Pronunciation, lectures on grammar, conversation practice, and introduction to the writing system (*Hankul*). Credit only on completion of KREN 120. L1 RP 1½ Course cr

\* **KREN 120b, Elementary Korean II** Seungja Choi  
Continuation of KREN 110. After KREN 110 or equivalent. L2 RP 1½ Course cr

\* **KREN 130a, Intermediate Korean I** Seungja Choi  
Continued development of skills in modern Korean, spoken and written, leading to intermediate-level proficiency. After KREN 120 or equivalent. L3 RP 1½ Course cr

\* **KREN 132a, Intermediate Korean for Advanced Learners I** Seungja Choi  
Intended for students with some oral proficiency but little or no training in *Hankul*. Focus on grammatical analysis, the standard spoken language, and intensive training in reading and writing. L3 RP 1½ Course cr

\* **KREN 140b, Intermediate Korean II** Angela Lee-Smith  
Continuation of KREN 130. After KREN 130 or equivalent. L4 RP 1½ Course cr

\* **KREN 142b, Intermediate Korean for Advanced Learners II** Angela Lee-Smith  
Continuation of KREN 132. After KREN 132 or equivalent. L4 RP 1½ Course cr



\* **KREN 152a, Advanced Korean for Advanced Learners** Angela Lee-Smith

An advanced course in modern Korean. Reading of short stories, essays, and journal articles, and introduction of 200 Chinese characters. Students develop their speaking and writing skills through discussions and written exercises. After KREN 142 or 151, or with permission of instructor. L5 1½ Course cr

\* **KREN 154b, Advanced Korean III** Seungja Choi

An advanced language course designed to develop reading and writing skills using Web-based texts in a variety of genres. Students read texts independently and complete comprehension and vocabulary exercises through the Web. Discussions, tests, and intensive writing training in class. After KREN 151 or equivalent. L5

## East Asian Studies

Director of undergraduate studies: Valerie Hansen, 227 HGS, 432-0480,  
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### FACULTY ASSOCIATED WITH THE PROGRAM OF EAST ASIAN STUDIES

**Professors** Daniel Botsman (*History*), Kang-i Sun Chang (*East Asian Languages & Literatures*), Deborah Davis (*Sociology*), Aaron Gerow (*East Asian Languages & Literatures, Film Studies*), Valerie Hansen (*History*), Edward Kamens (*East Asian Languages & Literatures*), William Kelly (*Anthropology*), Tina Lu (*East Asian Languages & Literatures*), Peter Perdue (*History*), Frances Rosenbluth (*Political Science*), Helen Siu (*Anthropology*), William Summers (*History of Medicine*), Jing Tsu (*East Asian Languages & Literatures*), Anne Underhill (*Anthropology*), Mimi Yiengpruksawan (*History of Art*)

**Associate Professors** Fabian Drixler (*History*), William Honeychurch (*Anthropology*), Karen Nakamura (*Anthropology*), Chloe Starr (*Divinity School*)

**Assistant Professors** William Fleming (*East Asian Languages & Literatures, Theater Studies*), Michael Hunter (*East Asian Languages & Literatures*), Seth Jacobowitz (*East Asian Languages & Literatures*), Youn-mi Kim (*History of Art*), Andrew Quintman (*Religious Studies*), Eric Weese (*Economics*), Jessica Weiss (*Political Science*)

**Senior Lecturers** Annping Chin (*History*), Pauline Lin (*East Asian Languages & Literatures*)

**Lecturers** Seok-ju Cho, Kazumi Hasegawa, Seunghan Paek, Jonathan Schlesinger, Bin Xu

**Senior Lectors II** Seungja Choi, Ling Mu

**Senior Lectors** Hsiu-hsien Chan, Min Chen, Koichi Hiroe, Angela Lee-Smith, Rongzhen Li, Ninghui Liang, Fan Liu, Yoshiko Maruyama, Michiaki Murata, Hiroyo Nishimura, Yu-lin Wang Saussy, Masahiko Seto, Jianhua Shen, Mari Stever, Wei Su, Haiwen Wang, Peisong Xu, William Zhou

**Lectors** Aoi Saito, Chuanmei Sun, Shucheng Zhang

In the East Asian Studies major, students focus on a country or an area within East Asia and concentrate their work in the humanities or the social sciences. The major offers a liberal education that serves as excellent preparation for graduate study or for business and professional careers in which an understanding of East Asia is essential.

**The major** The major in East Asian Studies is interdisciplinary, and students typically select classes from a wide variety of academic fields. The proposed course of study must be approved by the director of undergraduate studies.

The prerequisite to the major is completion of study at the L2 level of an East Asian language taught at Yale. Beyond this prerequisite, the major consists of thirteen course credits, which may include up to six taken in a preapproved program of study abroad. Six course credits must be taken in East Asian language courses, including a course at the L4 level and one year of advanced study (L5) with readings in the East Asian language.

Beyond the language requirement, the major includes seven course credits, six in the country or area of concentration and one outside it. Of the course credits in the area of concentration, one must be in the premodern period, at least two must be seminars, and one is the senior requirement (see below). These courses are normally taken at Yale during the academic year, but with prior approval of the director of undergraduate studies the requirement may be fulfilled through successful course work undertaken elsewhere.

**Credit/D/Fail** A maximum of one course taken Credit/D/Fail may be counted toward the requirements of the major, with permission of the director of undergraduate studies.

**Senior requirement** During the senior year, all students must satisfy a senior requirement consisting of a major research project that uses Chinese, Japanese, or Korean-language materials, reflects an up-to-date understanding of the region, and demonstrates a strong command of written English. This requirement can be met in one of three ways. Students may take a seminar in the country or area of concentration, culminating in a senior thesis. Alternatively, students who are unable to write a senior essay in a seminar may complete a one-term senior essay in EAST 480 or a one-credit, two-term senior research project in EAST 491, 492 culminating in an essay. The adviser for the senior project should be a faculty member associated with the program of East Asian Studies with a reading knowledge of the target language materials consulted for the essay.

**Selection of courses** Upon entering the major, students are expected to draw up an intellectually coherent sequence of courses in consultation with the director of undergraduate studies. They must consult with the director of undergraduate studies each term concerning their course schedules. They should identify as soon as possible a faculty adviser in their area of specialization. As a multidisciplinary program, East Asian Studies draws on the resources of other departments and programs in the University. Students are encouraged to examine the offerings of other departments in both the humanities and the social sciences, as well as residential college seminars, for additional relevant courses. The stated area of concentration of each student determines the relevance and acceptability of other courses. For a complete listing of courses approved for the major, see the East Asian Studies Council Web site (<http://ceas.yale.edu>).

**Courses in the graduate and professional schools** Qualified students may elect pertinent courses in the Graduate School and in some of the professional schools with

permission of the instructor, the director of undergraduate studies, and the director of graduate studies or the dean or registrar of the professional school.

**Combined B.A./M.A. degree program** Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Simultaneous Award of the Bachelor's and Master's Degrees in section K (p. 63) of the Academic Regulations. Interested students should consult the director of undergraduate studies prior to the fifth term of enrollment for specific requirements in East Asian Studies.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** L2 level of an East Asian lang taught at Yale

**Number of courses** 13 course credits beyond prereq (incl senior req); up to 6 may be in preapproved study abroad

**Distribution of courses** 6 course credits in East Asian lang courses, incl 1 L4 course and 1 year at L5 level with readings in the lang; 6 addtl course credits in country or area of concentration, incl 1 in premodern era and 2 sems; 1 course credit on East Asia outside country or area of concentration

**Senior requirement** Senior sem culminating in a senior thesis, or one-term senior essay in EAST 480, or one-credit, two-term senior research project in EAST 491, 492

#### **EAST 219b / PLSC 179b, China in World Politics** Jessica Weiss

China's rise to prominence and its foreign relations from 1949 to the present, focusing on the post-Mao period. SO

#### \* **EAST 290a / EP&E 290a, Democracy, Development, and Security in the Korean Peninsula** Seok-Ju Cho

Politics and political economies in South and North Korea. Economic development, democratization, and political institutions of the two states; political and economic factors that have influenced the wide discrepancy between the two Koreas; issues in international relations, such as denuclearization, peacekeeping, and reunification. SO

#### **EAST 317a / HIST 317a, China's Global Twentieth Century** Peter Perdue and Staff

The history of China from the Sino-Japanese war of 1895 to the post-Deng era in the twenty-first century. Focus on China's connections with the rest of the world and on the experiences of ordinary Chinese people during a time of tumultuous change. HU

#### \* **EAST 326a / HIST 326Ja, Yale and Japan** Daniel Botsman

Exploration of Yale's rich historical connections to Japan. Focus on use of the University's museum and library collections to learn about various aspects of the Japanese past, from ancient times to the post-World War II era. Knowledge of Japanese helpful but not required. WR, HU

#### **EAST 338a / ECON 338a / GLBL 318a, The Next China** Stephen Roach

Economic development in China since the late 1970s. Emphasis on factors pushing China toward a transition from its modern export- and investment-led development model to a pro-consumption model. The possibility of a resulting identity crisis, underscored by China's need to embrace political reform and by the West's long-standing misperceptions of China. Prerequisite: introductory macroeconomics. SO

\* **EAST 357b / EP&E 293b / PLSC 390b, State and Society in Post-Mao China**

Jessica Weiss

State-society relations in the People's Republic of China. Popular protest and social mobilization, media commercialization and the Internet, and prospects for political reform and democratization. SO

\* **EAST 408a / EP&E 269a / SOCY 395a, Wealth and Poverty in Modern China**

Deborah Davis

The underlying causes and consequences of the changing distribution of income, material assets, and political power in contemporary China. Substantive focus on inequality and stratification. Instruction in the use of online Chinese resources relevant to research. Optional weekly Chinese language discussions. Prerequisite: a previous course on China since 1949. SO

\* **EAST 410b / SOCY 310b, Civil Society, Public Sphere, and Civic Life in Contemporary China**

Deborah Davis

The changing character of civil society and the public sphere under various political conditions in modern China. Key themes are the possibilities for civic action, citizenship, and state-society relations. Prerequisite: a previous course on modern China or extended residence in Taiwan, Hong Kong, or the People's Republic of China. Preference to majors in Sociology or East Asian Studies in their junior and senior years. SO

\* **EAST 443b / SOCY 374b, Collective Memories in East Asia**

Staff

Contemporary collective memory issues explored in the context of political forces and social changes in East Asia. Topics include general theories, nation-states and memories, wars and atrocities, and politics and memories. Readings from sociology, history, anthropology, and cultural studies. HU

\* **EAST 444a / EVST 323a / HIST 332Ja, China's Environmental History since 1600**

Jonathan Schlesinger

Recent scholarship on climate change, resource management, water conservancy, public sanitation, and the shifting meanings of nature in Chinese culture and science from the early modern period to the present. Ways in which Chinese history and the natural environment have shaped one another; relations between China's environmental history and contemporary global trends. HU

\* **EAST 446a / ARCH 355a / HSAR 454a, South Korean Urbanism**

Staff

Modern and contemporary South Korean urbanism and its relation to discourses of the everyday. Focus on Seoul as a case study, with attention to commercial environments, ephemeral urban events, and local street cultures. Key texts by philosophers, historians, architectural theorists, and art historians analyzed in the context of artistic and architectural responses to Seoul's urbanism in recent decades. HU

\* **EAST 447b / HIST 327Jb, Civilization in Meiji Japan**

Kazumi Hasegawa

Transformations in Japanese daily life, culture, politics, and economics during the Meiji period. Ways in which particular concepts and identities were shaped and constructed, including gender, sexuality, ethnicity, time, and language. The influence of Meiji Japan on modern Japanese history and society. HU

\* **EAST 454b / ECON 474b / GLBL 312b, Economic and Policy Lessons from Japan**  
Stephen Roach

An evaluation of Japan's protracted economic problems and of their potential implications for other economies, including the United States, Europe, and China. Currency pressures, policy blunders, Abenomics, bubbles, and the global economic crisis of 2008; dangers to the global economy from a protracted postcrisis recovery period. Focus on policy remedies to avert similar problems in other countries.  
Prerequisite: a course in macroeconomics. SO

\* **EAST 474b / HSAR 484b, Japanese Screens** Mimi Yiengpruksawan

The screen-painting tradition in Japan, particularly as it emerged in the sixteenth and seventeenth centuries. The format, techniques, and functions of screen painting; poetic and literary connections, as well as studio practices and politics, of the principal lineages of painters; aesthetics and styles associated with varying classes of patronage, from the shoguns to Buddhist monks to the Japanese court. HU

\* **EAST 480a or b, One-Term Senior Essay** Valerie Hansen

Preparation of a one-term senior essay under the guidance of a faculty adviser. Students must receive the prior agreement of the director of undergraduate studies and of the faculty member who will serve as the senior essay adviser. Students must arrange to meet with that adviser on a regular basis throughout the term.

\* **EAST 491a and EAST 492b, Senior Research Project** Valerie Hansen

Two-term directed research project under the supervision of a ladder faculty member. Students should write essays using materials in East Asian languages when possible. Essays should be based on primary material, whether in an East Asian language or English. Summary of secondary material is not acceptable. Credit for EAST 491 only on completion of EAST 492. ½ Course cr per term

## Electives within the Major

### PREMODERN PERIOD

\* **ANTH 326b / ARCG 326b, Ancient Civilizations of the Eurasian Steppes**

William Honeychurch

Examination of peoples of the steppe zone that stretches from Eastern Europe to Mongolia. Overview of what archaeologists know about Eurasian steppe societies, with emphasis on the Neolithic, Bronze and Iron, and medieval ages. Attention both to material culture and to historical sources. Topics range from the domestication of the horse to Genghis Khan's world empire, including the impact these events had on neighboring civilizations in Europe and Asia. SO  
Anthropology: Archaeology

\* **ANTH 362b, Unity and Diversity in Chinese Culture** Helen Siu

An exploration of the Chinese identity as it has been reworked over the centuries. Major works in Chinese anthropology and their intellectual connections with general anthropology and historical studies. Topics include kinship and marriage, marketing systems, rituals and popular religion, ethnicity and state making, and the cultural nexus of power.  
Anthropology: Sociocultural

\* **ANTH 397a / ARCG 397a, Archaeology of East Asia** Anne Underhill

Introduction to the findings and practice of archaeology in China, Japan, Korea, and southeast Asia. Methods used by archaeologists to interpret social organization, economic organization, and ritual life. Attention to major transformations such as the initial peopling of an area, establishment of farming villages, the development of cities, interregional interactions, and the nature of political authority. SO

Anthropology: Archaeology

**CHNS 170a, Introduction to Literary Chinese I** Pauline Lin

Reading and interpretation of texts in various styles of literary Chinese (*wenyan*), with attention to basic problems of syntax and literary style. After CHNS 151, 153, or equivalent. L5

**CHNS 171b, Introduction to Literary Chinese II** Pauline Lin

Continuation of CHNS 170. After CHNS 170. L5 RP

**EALL 200a / HUMS 432a, The Chinese Tradition** Tina Lu

An introduction to the literature, culture, and thought of premodern China, from the beginnings of the written record to the turn of the twentieth century. Close study of textual and visual primary sources, with attention to their historical and cultural backdrops. No knowledge of Chinese required. HU

\* **EALL 211a / WGSS 405a, Women and Literature in Traditional China**

Kang-i Sun Chang

A study of major women writers in traditional China, as well as representations of women by male authors. The power of women's writing; women and material culture; women in exile; courtesans; Taoist and Buddhist nuns; widow poets; cross-dressing women; the female body and its metaphors; footbinding; notions of love and death; the aesthetics of illness; women and revolution; poetry clubs; the function of memory in women's literature; problems of gender and genre. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 201. HU TR

\* **EALL 236a / HUMS 435a / LITR 181a, Japanese Poetry and Poetics**

Edward Kamens and Staff

Core concepts and traditions of classical Japanese poetry explored through the medium of translation. Readings from anthologies and treatises of the ninth through early twentieth centuries. Attention to recent critical studies in transcultural poetic theory. Inspection and discussion of related artifacts in the Beinecke Rare Book and Manuscript Library and the Yale University Art Gallery. Readings and discussion in English. HU

\* **EALL 303a, Readings in Classical Chinese Poetry** Kang-i Sun Chang

Fundamentals of classical Chinese poetry and poetics. Readings vary from year to year; topics include poetry and history, intertextuality, and poetic reception. Readings in Chinese; discussion in English. Prerequisite: CHNS 171 or equivalent, or permission of instructor. Formerly CHNS 303. HU

\* **HIST 038b, The Mongols in China** Valerie Hansen

Non-Chinese peoples in China who preceded Chinggis Khan's unification of the nomads in 1206. The rise of non-Chinese dynasties beginning in the early tenth century; reasons for their success; the legacy of the Mongols from the fall of their empire in China to the early twentieth century. Extensive use of primary sources.

Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU  
History: Preindustrial

**HIST 321b, China from Present to Past** Valerie Hansen and Peter Perdue  
Underlying causes of current issues facing China traced back to their origins in the premodern period. Topics include economic development, corruption, environmental crises, gender, and Pacific island disputes. Selected primary-source readings in English, images, videos, and Web resources. HU

**HIST 470a, World Finance, Mesopotamia to the Present**

Valerie Hansen and William Goetzmann

The history of finance from its earliest beginnings to the modern era, with particular attention to Mesopotamia, China, and Europe. The time value of money, including loans and interest; the negotiability of claims within a legal structure that handles claims; the ability to contract on future outcomes through life insurance and derivatives; corporations; causes and outcomes of economic bubbles. HU RP

**JAPN 170a, Introduction to Literary Japanese** Edward Kamens

Introduction to the grammar and style of the premodern literary language (*bungotai*) through a variety of texts. After JAPN 151 or equivalent. L5

\* **JAPN 171b, Readings in Literary Japanese** Riley Soles

Close analytical reading of a selection of texts from the Nara through the Tokugawa periods: prose, poetry, and various genres. Introduction to *kanbun*. After JAPN 170 or equivalent. L5

**PHIL 210b, Eastern Philosophy** Quang Phu Van

An introduction to Eastern philosophy through the study of philosophical and religious texts. Topics include reality and illusion, knowledge, self, right and wrong, nonattachment, meditation, aesthetics, meaning of life, and death. HU

**RLST 126a, Tibetan Buddhism** Andrew Quintman

Introduction to major themes in Tibetan Buddhist thought and practice. Buddhist ethics, systems of monastic and ascetic life, ritual applications, sacred geography and pilgrimage, lay religion, and the status of Buddhism in Chinese-occupied Tibet and in the West. HU

\* **RLST 182b, Buddhist Traditions of Mind and Meditation** Andrew Quintman

Buddhist meditation practices examined in the context of traditional theories of mind, perception, and cognition. Readings both from Buddhist canonical works and from secondary scholarship on cognitive science and ritual practice. Recommended preparation: a course in Asian religions. HU

MODERN PERIOD

\* **ANTH 234b / WGSS 234b, Disability and Culture** Karen Nakamura

Exploration of disability from a cross-cultural perspective, using examples from around the globe. Disability as it relates to identity, culture, law, and politics. Case studies may include deafness in Japan, wheelchair mobility in the United States, and mental illness in the former Soviet republics. SO RP

Anthropology: Sociocultural

**ANTH 254a, Japan: Culture, Society, Modernity** William Kelly

Introduction to Japanese society and culture. The historical development of Japanese society; family, work, and education in contemporary Japan; Japanese aesthetics; and psychological, sociological, and cultural interpretations of Japanese behavior. WR, SO  
Anthropology: Sociocultural

**\* ANTH 342b, Cultures and Markets in Asia** Helen Siu

Historical and contemporary movements of people, goods, and cultural meanings that have defined Asia as a region. Reexamination of state-centered conceptualizations of Asia and of established boundaries in regional studies. The intersections of transregional institutions and local societies and their effects on trading empires, religious traditions, colonial encounters, and cultural fusion. Finance flows that connect East Asia and the Indian Ocean to the Middle East and Africa. The cultures of capital and market in the neoliberal and postsocialist world. SO  
Anthropology: Sociocultural

**\* ARCH 341a / LAST 318a, Globalization Space** Keller Easterling

Infrastructure space as a primary medium of change in global polity. Networks of trade, energy, communication, transportation, spatial products, finance, management, and labor, as well as new strains of political opportunity that reside within their spatial disposition. Case studies include free zones and automated ports around the world, satellite urbanism in South Asia, high-speed rail in Japan and the Middle East, agripoles in southern Spain, fiber optic submarine cable in East Africa, spatial products of tourism in North Korea, and management platforms of the International Organization for Standardization. HU

**EALL 248b / LITR 254b, Modern Chinese Literature** Jing Tsu

An introduction to modern Chinese literature. Themes include cultural go-betweens; sensations in the body; sexuality; diaspora, translation, and nationalism; globalization and homeland; and everyday life. No knowledge of Chinese required. HU

**EALL 255b, Japanese Modernism** Seth Jacobowitz

Japanese literature and art from the 1920s through the 1940s. The avant-garde and mass culture; popular genre fiction; the advent of new media technologies and techniques; effects of Japanese imperialism, militarism, and fascism on cultural production; experimental writers and artists and their resistance to, or complicity with, the state. HU

**\* EALL 275b / FILM 389b / LITR 365b, Crime in Japanese Film and Fiction**

Aaron Gerow

The depiction of crime in Japanese film and fiction, with a focus on the detective and gangster genres. Social, historical, and aesthetic implications, as well as differences from Euro-American and Asian crime films. HU

**\* EALL 300b, Sinological Methods** Pauline Lin

A research course in Chinese studies, designed for students with background in modern and literary Chinese. Exploration and evaluation of the wealth of primary sources and research tools available in Chinese. For native speakers of Chinese, introduction to the secondary literature in English and instruction in writing professionally in English on topics about China. Topics include the compilation and development of Chinese bibliographies; bibliophiles' notes; editions, censorship, and textual variation and reliability; specialized dictionaries; maps and geographical gazetteers; genealogies



and biographical sources; archaeological and visual materials; and major Chinese encyclopedias and compendia. Prerequisite: CHNS 171 or equivalent. Formerly CHNS 202. HU

\* **EALL 325b, Chinese Poetic Form, 1490–1990** Kang-i Sun Chang

Development of the classical Chinese poetic form by modern Chinese poets. The appeal and aesthetic concept of the classical form since the revivalist movement of the late fifteenth century. Emphasis on close critical reading, with attention to cultural and political contexts. Readings in Chinese; discussion in English. Prerequisite: a literary Chinese course or permission of instructor. HU

\* **EALL 357a, Meiji Literature and Visual Culture** Seth Jacobowitz

Introduction to the literature and visual culture of Meiji Japan (1868–1912), including novels, poetry, calligraphy, woodblock prints, painting, photography, and cinema. The relationship between theories and practices of fine art and literature; changes in word and image relations; transformations from woodblock to movable-type print culture; the invention of photography and early forms of cinematic practice. No knowledge of Japanese required. HU TR

**HIST 303b, Japan's Modern Revolution** Daniel Botsman

A survey of Japan's transformation over the course of the nineteenth century from an isolated, traditional society on the edge of northeast Asia to a modern imperial power. Aspects of political, social, and cultural history. HU

\* **PLSC 132a / GBL 379a, China's International Relations** Jessica Weiss

Analysis of contemporary Chinese diplomacy, including China's increasing regional and global influence. Mainstream concepts and theories in international relations applied to current events and policy debates. Priority to majors in Political Science and in Global Affairs. SO

\* **PLSC 162b, Japan and the World** Frances Rosenbluth

The historical development of Japan's international relations since the late Tokugawa period; World War II and its legacy; domestic institutions and foreign policy; implications for the United States; and interactions between nationalism and regionalism. SO

\* **SOCY 086a, Chinese Society since Mao** Deborah Davis

An overview of the major social institutions in contemporary China, with a focus on the changing relationship between individual and society. Use of print and visual sources to explore the social consequences of China's recent retreat from socialism and its rapid integration into the global economy. May count toward the Sociology major as an intermediate course. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO

## Ecology and Evolutionary Biology

Director of undergraduate studies: Thomas Near, 370A ESC, 432-3002,  
karen.broderick@yale.edu; cee.yale.edu

FACULTY OF THE DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY

**Professors** Leo Buss, † Peter Crane, † Nicholas Christakis, Michael Donoghue, † Vivian Irish, † Kenneth Kidd, David Post, Jeffrey Powell, Richard Prum, † Eric Sargis,

† Oswald Schmitz, † David Skelly, Stephen Stearns, Paul Turner (*Chair*), † J. Rimas Vaišnys, Günter Wagner

**Associate Professors** † Alison Galvani, Walter Jetz, Thomas Near, † Jeffrey Townsend

**Assistant Professors** † Forrest Crawford, Carla Staver, David Vasseur

**Senior Lecturer** Marta Martínez Wells

**Lecturers** Gisella Caccone, Mary Beth Decker

† A joint appointment with primary affiliation in another department or school.

The Department of Ecology and Evolutionary Biology (EEB) offers broad education in the biological sciences. The subject matter includes molecules, cells, organs, organisms, and ecosystems and the evolutionary processes that shape them. The department offers a B.A. and a B.S. degree. The B.A. program is intended for students who are interested in ecology, evolution, and organismal diversity as part of a liberal education but do not intend to pursue graduate work in the discipline. The B.S. program is designed for students planning to attend medical or veterinary school or to pursue graduate study in ecology and evolutionary biology, other biological disciplines, or the environmental sciences. The two programs share the same prerequisites and core requirements but differ in their electives and senior requirements.

Students majoring in EEB select one of two tracks. The requirements for Track 1 emphasize courses appropriate for careers in ecology, evolutionary biology, and environmental science; Track 2 is most appropriate for premedical and preveterinary students because it allows them to use as electives many courses required by medical schools. The EEB major offers opportunities for independent research in both laboratory-based and field-based scientific investigations.

**Courses for nonmajors** Several EEB courses have no college-level prerequisites and are suitable for nonmajors. These include all 100-level offerings as well as 200-level courses that deal with particular organism groups such as plants, fish, mammals, birds, or insects.

**Prerequisites** The prerequisites for the major are intended to provide core scientific literacy; they include courses in biology, chemistry, physics, and mathematics. The introductory biology sequence BIOL 101, 102, 103, and 104 is required. Also required are CHEM 112, 113, or 114, 115, or 118, taken with their associated laboratories, and one term of organic chemistry with laboratory. CHEM 124, 125, with 222L, 223L, satisfies both chemistry requirements. Two terms of physics are required, PHYS 170, 171 or higher, and one term of mathematics, MATH 115 or higher or STAT 101–106. A different statistics course approved by the director of undergraduate studies may be substituted for the mathematics prerequisite.

Acceleration credit awarded in chemistry, mathematics, and physics, or completion of advanced courses in those departments, is accepted in place of the corresponding prerequisites for the EEB major. Students who have mathematics preparation equivalent to MATH 115 or higher are encouraged to take a statistics course (most often STAT 101–106) and/or additional mathematics courses such as MATH 120, 121, 222, or 225. Because chemistry courses are prerequisite to several EEB courses, students are strongly urged to take general and organic chemistry in the freshman and sophomore

years. Students who place out of general chemistry should take organic chemistry during their freshman year. Finishing the prerequisites early allows for a more flexible program in later years.

**Placement** Students can place out of the introductory biology sequence (BIOL 101, 102, 103, 104) only by means of the biology placement examination administered jointly by the biological science departments, EEB, MB&B, and MCDB. See the EEB departmental Web site (<http://eeb.yale.edu>) for information about the placement examination.

Potential EEB majors are expected to take the mathematics placement test. Those who place above the level of MATH 112 may proceed to prerequisite courses for the EEB major; those who place into MATH 112 must take calculus before other prerequisites. The Chemistry department arranges placement in chemistry courses.

**Requirements of the major** Beyond the prerequisites, the B.A. requires three lecture courses and one laboratory, for three and one-half course credits, and the senior requirement. In Track 1, the required courses are E&EB 220, 225, and a lecture course on organismal diversity chosen from E&EB 246–272, along with its associated laboratory. Required courses in Track 2 include E&EB 290, 291L, BENG 350, and MCDB 300.

The B.S. requirements are the same as those for the B.A., with the addition of at least two electives, for two course credits, in either Track 1 or Track 2. At least one of the electives must be a lecture or a seminar. Most EEB, MCDB, or MB&B courses numbered 200 or above qualify as electives, as do most research courses and laboratories in a biological sciences department or in the Medical School. Courses from other departments may qualify with permission of the director of undergraduate studies.

**Substitutions permitted** Two upper-level courses in Geology and Geophysics (excluding paleobiology courses), Mathematics, Computer Science, or Engineering and Applied Science can be substituted for the required term of organic chemistry and laboratory. The second term of organic chemistry and laboratory and up to two terms of physics laboratories are allowed as electives. Courses from other departments may also be suitable as electives. All substitutions require the permission of the director of undergraduate studies. College seminars may not be counted toward the requirements of the major.

**Senior requirement** Students in the B.A. degree program fulfill the senior requirement either by completing one term of independent study in E&EB 470 during the senior year or by writing a senior essay. The senior essay may be related to the subject matter of a course, but the essay is a separate departmental requirement in addition to any work done in a course and does not count toward the grade in any course. Students intending to write a senior essay must obtain an approval form from the office of the director of undergraduate studies and have it signed by the essay adviser before the end of the course selection period. Essays must be submitted to the director of undergraduate studies by the last day of classes.

Students in the B.S. degree program fulfill the senior requirement by completing one term of original research in E&EB 475, 495, or 496 in the senior year. Additional research courses may be taken as electives and may be taken before the senior year, but

any research course intended to satisfy the senior requirement must be taken during the senior year.

**Credit/D/Fail** No course taken Credit/D/Fail may be counted toward the EEB major, including prerequisites.

**Limit on research courses** While independent research courses may be taken multiple times for credit, there are restrictions on the number of such courses that can be included in a student's curriculum. See Course Credits and Course Loads (p. 43) in the Academic Regulations.

**Graduate courses of interest to undergraduates** Graduate courses in the biological and biomedical sciences that may be of interest to undergraduates are listed in the Graduate School's online bulletin (<http://www.yale.edu/printer/bulletin/htmlfiles/grad>), and many are posted on the Biological and Biomedical Sciences Web site (<http://bbs.yale.edu>). Additional information is available from the director of undergraduate studies and the director of graduate studies. Undergraduates with an appropriate background may enroll with the permission of the director of graduate studies and the instructor.

**Advising** Freshmen considering a major in Ecology and Evolutionary Biology are invited to consult with the director of undergraduate studies. After the freshman year, students should choose an adviser from the department faculty who has interests comparable to their own and/or is a fellow of their residential college. For additional information, visit the EEB departmental Web site (<http://eeb.yale.edu>). The course schedules of all EEB majors (including sophomores intending to major in EEB) must be signed by a faculty member in EEB; the signature of the director of undergraduate studies is not required. Students whose regular adviser is on leave can consult the director of undergraduate studies to arrange for an alternate.

**Study abroad** Participation in study abroad field programs is encouraged. Credit for such programs may apply toward the major; interested students should consult the director of undergraduate studies prior to going abroad.

**Combined B.S./M.S. degree program** Exceptionally able and well-prepared students may accelerate their professional education by completing a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. Students may not enroll in Yale College for more than eight terms in order to qualify for the simultaneous award of both degrees. It is possible to earn both degrees in fewer than eight terms, but not by the use of acceleration credits. The requirements are as follows:

1. Candidates must satisfy the Yale College requirements for the B.S. degree. In addition to the three lecture courses and one laboratory specified for the standard major, four courses are required, all of which must be graduate-level courses. One of these must be a graduate seminar selected with the approval of the director of undergraduate studies. Grades below B in graduate courses are not accepted.
2. In addition to the courses specified above, students must complete two graduate research courses for six course credits: (a) E&EB 585, a two-credit course typically taken in the second term of the junior year. At the start of the course, each student forms a committee comprised of the adviser and two faculty members that meets

to discuss the research project. Two of the members of this committee must be members of the EEB faculty. At the end of the course, the student completes a detailed prospectus describing the thesis project and the work completed to date. The committee evaluates an oral and written presentation of the prospectus and determines whether the student may continue in the combined program; (b) E&EB 595, a four-credit, yearlong course that is similar to E&EB 495, 496 and is taken during the senior year. In the first term of the course, the student gives an oral presentation describing the work. At the end of the course, the student submits a master's thesis and gives an oral defense, followed by a comprehensive examination of the thesis conducted by the thesis committee. Upon successful completion of this examination, as well as all other requirements, the student is awarded the combined B.S./M.S. degree. Summer research between the junior and senior years is often required to obtain sufficient results for a credible master's thesis.

Students must also satisfy the requirements of Yale College for the simultaneous award of the bachelor's and master's degrees, including the following:

1. To be considered for admission to the program, by the end of their fifth term of enrollment students must have achieved at least two-thirds A or A- grades in all of their course credits as well as in all of the course credits directly relating to the major, including prerequisites.
2. Students must apply in writing to the director of undergraduate studies and obtain departmental approval no later than the last day of classes in their fifth term of enrollment in Yale College. Students must have the approval of both the director of undergraduate studies and the director of graduate studies to receive graduate credit for the graduate courses they select.
3. Graduate work must not be entirely concentrated in the final two terms, and students in the program must take at least six term courses outside the department during their last four terms at Yale and at least two undergraduate courses during their last two terms.
4. Students must earn grades of A in at least two of their graduate-level term courses or in one year course.

For more information, see Simultaneous Award of the Bachelor's and Master's Degrees in section K (p. 63) of the Academic Regulations.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** BIOL 101, 102, 103, 104; CHEM 112, 113, or 114, 115, or 118, with labs; 1 term of organic chem with lab (CHEM 124, 125 with 222L, 223L satisfies both chem requirements); PHYS 170, 171 or higher; MATH 115 or higher or STAT 101-106

**Number of courses** *B.A.* - 3½ course credits (not incl senior req); *B.S.* - 5½ course credits (not incl senior req)

**Specific courses required** *Track 1* - E&EB 220, 225; 1 from E&EB 246-272, with lab; *Track 2* - E&EB 290, 291L, BENG 350, MCDB 300

**Distribution of courses** *B.S.* - 2 electives

**Substitutions permitted** Other stat course approved by DUS for math or stat prereq; two upper-level courses in G&G, Math, Comp Sci, or E&AS for organic chem and lab,

with DUS permission; the second term of organic chem and lab and two physics labs for electives, with DUS permission

**Senior requirement** *B.A.* – E&EB 470 taken in the senior year or senior essay;  
*B.S.* – E&EB 475, 495, or 496 taken in senior year

## Introductory Courses

**E&EB 115a / F&ES 315a, Conservation Biology** Linda Puth

An introduction to ecological and evolutionary principles underpinning efforts to conserve Earth's biodiversity. Efforts to halt the rapid increase in disappearance of both plants and animals. Discussion of sociological and economic issues. SC

\* **E&EB 125b / G&G 125b, History of Life** Pincelli Hull

Examination of fossil and geologic evidence pertaining to the origin, evolution, and history of life on Earth. Emphasis on major events in the history of life, on what the fossil record reveals about the evolutionary process, on the diversity of ancient and living organisms, and on the evolutionary impact of Earth's changing environment. SC

**E&EB 145b, Plants and People** Linda Puth

The interaction of plants and people throughout history explored from biological, historical, anthropological, and artistic perspectives. Basic botany; plants in the context of agriculture; plants as symbols; plants in the environment. Includes visits to the Peabody Museum, the Marsh Botanical Garden, and the Yale Art Gallery. SC

**E&EB 190a / DEVN 196a / HUMS 289a, The Evolution of Beauty** Richard Prum

Aesthetics and beauty explored from the perspectives of evolutionary biology, zoology, human biology, arts, and culture. Survey of the mechanisms and processes of aesthetic evolution in animals and plants; the nature of sexual conflict over reproduction; the role of aesthetic preferences in the evolution of sexual autonomy; human aesthetics and human art.

**E&EB 210a / STAT 101a, Introduction to Statistics: Life Sciences**

Jonathan Reuning-Scherer and Walter Jetz

Statistical and probabilistic analysis of biological problems, presented with a unified foundation in basic statistical theory. Problems are drawn from genetics, ecology, epidemiology, and bioinformatics. QR

**E&EB 250a, Biology of Terrestrial Arthropods** Marta Wells

Evolutionary history and diversity of terrestrial arthropods (body plan, phylogenetic relationships, fossil record); physiology and functional morphology (water relations, thermoregulation, energetics of flying and singing); reproduction (biology of reproduction, life cycles, metamorphosis, parental care); behavior (migration, communication, mating systems, evolution of sociality); ecology (parasitism, mutualism, predator-prey interactions, competition, plant-insect interactions). SC

**E&EB 251La, Laboratory for Biology of Terrestrial Arthropods** Marta Wells

Comparative anatomy, dissections, identification, and classification of terrestrial arthropods; specimen collection; field trips. Concurrently with or after E&EB 250. SC

½ Course cr

**E&EB 264b, Ichthyology** Thomas Near

A survey of fish diversity, including jawless vertebrates, chimaeras and sharks, lungfishes, and ray-finned fishes. Topics include the evolutionary origin of vertebrates, the fossil record of fishes, evolutionary diversification of major extant fish lineages, biogeography, ecology, and reproductive strategies of fishes. SC

**E&EB 265Lb, Laboratory for Ichthyology** Thomas Near

Laboratory and field studies of fish diversity, form, function, behavior, and classification. The course primarily involves study of museum specimens and of living and fossil fishes. Concurrently with E&EB 264. SC ½ Course cr

## Intermediate and Advanced Courses

Prerequisites for all intermediate and advanced E&EB courses are BIOL 101, 102, 103, and 104, or permission of the instructor.

**E&EB 220a / EVST 223a, General Ecology** David Post and Ann Staver

The theory and practice of ecology, including the ecology of individuals, population dynamics and regulation, community structure, ecosystem function, and ecological interactions at broad spatial and temporal scales. Topics such as climate change, fisheries management, and infectious diseases are placed in an ecological context. Prerequisite: MATH 112 or equivalent. SC

**\* E&EB 223Lb, Evolution, Functional Traits, and the Tree of Life** Marta Wells

Study of evolutionary novelties, their functional morphology, and their role in the diversity of life. Introduction to techniques used for studying the diversity of animal body plans. Evolutionary innovations that have allowed groups of organisms to increase their diversity. SC ½ Course cr

**E&EB 225b, Evolutionary Biology** Jeffrey Powell and Stephen Stearns

An overview of evolutionary biology as the discipline uniting all of the life sciences. Reading and discussion of scientific papers to explore the dynamic aspects of evolutionary biology. Principles of population genetics, paleontology, and systematics; application of evolutionary thinking in disciplines such as developmental biology, ecology, microbiology, molecular biology, and human medicine. SC  
Psychology: AdvSci NeuroTrk

**E&EB 226Lb, Laboratory for Evolutionary Biology** Adalgisa Caccone

The companion laboratory to E&EB 225. Patterns and processes of evolution, including collection and interpretation of molecular and morphological data in a phylogenetic context. Focus on methods of analysis of species-level and population-level variation in natural populations. Concurrently with or after E&EB 225 or with permission of instructor. SC ½ Course cr

**\* E&EB 280a / ANTH 310a, Mammalogy** Eric Sargis

The evolution and diversity of mammals, including primates. Origins, evolutionary history, systematics, morphology, biogeography, physiology, behavior, and ecology of major mammalian lineages. Accompanying laboratories focus on diagnostic morphological features of mammalian groups through examination of specimens from the Peabody Museum. SC

**E&EB 290b, Comparative Anatomy of Vertebrates** Günter Wagner

A survey of the structure, variation, and evolution of major vertebrate groups. Topics include the microanatomy of major organ systems, the embryology of the vertebrate body plan, and the structure and evolution of the major organ systems such as the locomotory system, sensory organs, digestive tract, reproductive tract, and nervous system. SC

\* **E&EB 291Lb, Comparative Anatomy of Vertebrates Laboratory** Günter Wagner  
Microscopic examination of histological and embryological preparations. Dissection of selected vertebrate species including shark, bony fish, frog, lizard, and rat. To be taken with E&EB 290. SC ½ Course cr

\* **E&EB 342b / ANTH 335b, Primate Diversity and Evolution** Eric Sargis  
The diversity and evolutionary history of living and extinct primates. Focus on major controversies in primate systematics and evolution, including the origins and relationships of several groups. Consideration of both morphological and molecular studies. Morphological diversity and adaptations explored through museum specimens and fossil casts. Recommended preparation: ANTH 116. SC

**E&EB 428a / AMTH 428a / G&G 428a / PHYS 428a, Science of Complex Systems**

Jun Korenaga

Introduction to the quantitative analysis of systems with many degrees of freedom. Fundamental components in the science of complex systems, including how to simulate complex systems, how to analyze model behaviors, and how to validate models using observations. Topics include cellular automata, bifurcation theory, deterministic chaos, self-organized criticality, renormalization, and inverse theory. Prerequisite: PHYS 301, MATH 247, or equivalent. QR, SC

\* **E&EB 460b / HLTH 480b, Studies in Evolutionary Medicine I** Stephen Stearns  
Principles of evolutionary biology applied to issues in medical research and practice. Lactose and alcohol tolerance; the "hygiene hypothesis"; genetic variation in drug response and pathogen resistance; spontaneous abortions, immune genes, and mate choice; the evolution of aging; the ecology and evolution of disease; the emergence of new diseases. Students develop proposals for research to be conducted during the summer. Admission by competitive application; forms are available on the EEB Web site (<http://www.eeb.yale.edu>). SC

\* **E&EB 461a / HLTH 481a, Studies in Evolutionary Medicine II**

James Childs, Durland Fish, and Alison Galvani

Continuation of E&EB 460. Prerequisite: E&EB 460 or permission of instructor. SC

\* **E&EB 470a or b, Tutorial** Marta Wells

Individual or small-group study for qualified students who wish to investigate an area of ecology or evolutionary biology not presently covered by regular courses. A student must be sponsored by a faculty member who sets requirements and meets weekly with the student. One or more written examinations and/or a term paper are required. To register, the student must submit a written plan of study approved by the faculty instructor to the director of undergraduate studies. Students are encouraged to apply during the term preceding the tutorial. Proposals must be submitted no later than the end of the second week of the term in which the student enrolls in the tutorial. The final paper is due in the hands of the director of undergraduate studies by the first day of reading period in the term of enrollment. In special cases, with approval of the



director of undergraduate studies, this course may be elected for more than one term, but only one term will count as an elective for the major. Normally, faculty sponsors must be members of the EEB department. Fulfills the senior requirement for the B.A. degree if taken in the senior year.

**\* E&EB 475a or b, Research** Marta Wells

One term of original research in an area relevant to ecology or evolutionary biology. This may involve, for example, laboratory work, fieldwork, or mathematical or computer modeling. Students may also work in areas related to environmental biology such as policy, economics, or ethics. The research project may not be a review of relevant literature but must be original. In all cases students must have a faculty sponsor who oversees the research and is responsible for the rigor of the project. Students are expected to spend ten hours per week on their research projects. Using the form available from the office of undergraduate studies or from the Classes server, students must submit a research proposal that has been approved by the faculty sponsor to the director of undergraduate studies, preferably during the term preceding the research. Proposals are due Friday, September 5, for the fall term and Tuesday, January 20, for the spring term. The final research paper is due in the hands of the director of undergraduate studies by Friday, December 5, for the fall term and Friday, April 24, for the spring term. Fulfills the senior requirement for the B.S. degree if taken in the senior year.

**\* E&EB 495a and E&EB 496b, Intensive Senior Research** Thomas Near

One term of intensive original research during the senior year under the sponsorship of a Yale faculty member. Similar to other research courses except that a more substantial portion of a student's time and effort should be spent on the research project (a minimum average of twenty hours per week). A research proposal approved by the sponsoring faculty member must be submitted to the instructor; forms are available from the office of undergraduate studies or from the instructor. For the fall term, approval is encouraged during the the spring term of the junior year and must be done by Friday, September 5; for the spring term, submission of the research proposal is encouraged during the fall term and must be done by Tuesday, January 20. Students who wish to take both E&EB 495 and 496 under the sponsorship of the same faculty member may submit a single proposal by the fall deadline; in this case, the grade assigned at the end of the spring term applies to all four credits. Students who take 495 and 496 under the sponsorship of different faculty members complete an interim oral report and submit a final paper in each term; a separate grade is assigned in each term. The due date for papers in E&EB 495 is Friday, December 5; the due date for E&EB 496 only or for 495 and 496 is Friday, April 24. One term fulfills the senior requirement for the B.S. degree. 2 Course cr per term

## Economics

Director of undergraduate studies: Samuel Kortum, Rm. 305, 28 Hillhouse Ave., 432-6217 or 432-3574, qazi.azam@yale.edu; economics.yale.edu/undergraduate-program

### FACULTY OF THE DEPARTMENT OF ECONOMICS

**Professors** Joseph Altonji, Donald Andrews, Dirk Bergemann, Steven Berry, Truman Bewley, Donald Brown, Xiaohong Chen, † Judith Chevalier, Pradeep Dubey (*Visiting*),

Ray Fair, † Joan Feigenbaum, † Howard Forman, John Geanakoplos, † William Goetzmann, Pinelopi Goldberg, Timothy Guinnane, Philip Haile, Johannes Horner, Gerald Jaynes, Dean Karlan, Yuichi Kitamura, Alvin Klevorick, Samuel Kortum, Naomi Lamoreaux, Richard Levin, Giovanni Maggi, Konstantinos Meghir, † Robert Mendelsohn, Giuseppe Moscarini, † Barry Nalebuff, Zvika Neeman (*Visiting*), William Nordhaus, Peter Phillips, Benjamin Polak, † John Roemer, Mark Rosenzweig, Larry Samuelson, † Peter Schott, Robert Shiller, † Jody Sindelar, Anthony Smith, † Shyam Sunder, Aleh Tsyvinski, Christopher Udry, Ebonya Washington, † Ernesto Zedillo

**Associate Professors** Costas Arkolakis, Eduardo Faingold, Nancy Qian, Kareen Rozen

**Assistant Professors** Timothy Armstrong, Jose-Antonio Espin-Sanchez, Mitsuru Igami, Daniel Keniston, Amanda Kowalski, Michael Peters, Nicholas Ryan, Joseph Shapiro, Eric Weese

**Senior Lecturers** Cheryl Doss, Tolga Koker, Douglas McKee

**Lecturers** Irasema Alonso, Michael Boozer, Michael Schmertzler, Katerina Simons, David Swensen, Dean Takahashi

† Primary appointment in another department or school.

Economics concerns the wealth of nations, its origins in production and exchange, its allocation among competing uses, its distribution among individuals, and its accumulation or decline. Economics at Yale is regarded and taught as part of a liberal education, not as a preparation for any particular vocation. Nonetheless, economics provides an especially relevant background for a number of professions.

**Requirements of the major** Students majoring in Economics are required to take twelve term courses. Two of these may be introductory economics courses, one in microeconomics and one in macroeconomics. All majors must take the following courses: one term of intermediate microeconomics (ECON 121 or 125); one term of intermediate macroeconomics (ECON 122 or 126); one term of econometrics (ECON 131, 132, or 136); and one Yale mathematics course, usually selected from MATH 112, 115, 118, or 120. Students who place out of these mathematics courses must take a higher-level mathematics course at Yale and should consult the director of undergraduate studies in Economics. All of these required courses should be completed prior to the senior year. Majors must also take two courses numbered ECON 400–491, at least one of which must be taken in the senior year.

Subject to approval by the director of undergraduate studies, students may count toward the major one course related to economics but taught in another field, in addition to the required course in mathematics.

Students who take a term abroad or take summer courses not at Yale may petition the director of undergraduate studies to count at most two courses from outside Yale toward the requirements of the major. Students who take a year abroad may petition to count at most three courses. Many economics courses taken outside Yale do not meet the requirements of the Economics major; students should consult with the director of undergraduate studies before taking such courses. Courses taken outside Yale may not be counted toward the major requirements in intermediate microeconomics, intermediate macroeconomics, or econometrics.

Courses taken Credit/D/Fail and residential college seminars may not be counted toward the requirements of the major.

**Introductory courses** These courses serve students considering a major in Economics as well as others who would like an introduction to the subject. Most students enroll in ECON 115 and 116, lecture courses with a discussion section. ECON 115 is concerned with microeconomics and includes such topics as markets, prices, production, distribution, and the allocation of resources. ECON 116 covers such macroeconomic issues as unemployment, inflation, growth, and international economics; it has a microeconomics prerequisite.

ECON 110 and 111 are limited-enrollment alternatives to ECON 115 and 116; they are open only to freshmen selected from those who preregister. ECON 108 also covers microeconomics, but with a greater emphasis on quantitative methods and examples. It is intended for, but not restricted to, freshmen with little or no experience with calculus. Enrollment is limited, and preregistration is required. ECON 108, 110, and 115 are similar in substance, and ECON 111 and 116 are similar in substance as well. A student may receive credit for only one course each in introductory microeconomics and introductory macroeconomics.

The department recommends that students interested in majoring in Economics take introductory economics in the freshman year. In order to make the introductory courses available to all freshmen and to students majoring in other subjects, the introductory courses do not have a mathematics requirement.

**Placement and exemptions for introductory courses** Students with a score of 5 on the Advanced Placement tests for microeconomics and macroeconomics *and* a score of 5 on the Advanced Placement Calculus BC test may petition the director of undergraduate studies to place out of introductory microeconomics and introductory macroeconomics and enroll directly in intermediate microeconomics. It is recommended that students with a score of 5 on the Advanced Placement economics tests but without a 5 on the Calculus BC test take a Yale mathematics course such as MATH 115 or 120 and then petition the director of undergraduate studies to place out of introductory microeconomics and take intermediate microeconomics in the following term. Students with high scores on examinations equivalent to Advanced Placement, such as the GCE A-level or Higher Level International Baccalaureate, may also petition to be exempted from the introductory courses. For other placement and exemption questions, consult the departmental Web site (<http://economics.yale.edu/undergraduate-program>).

**Mathematics** Students are advised to meet the mathematics requirement for the major during their freshman year. The department also recommends that majors either complete MATH 118 or complete two term courses including MATH 120 and either 222 or 225. The latter two-term sequence is preferable for students who wish to take further mathematics courses or who plan to pursue a graduate degree in economics.

**Econometrics** Students are advised to take a two-term sequence of statistics and econometrics courses, especially if they are considering a senior essay. One option is to take ECON 131 followed by 132. Students with a stronger mathematics background or who plan to pursue a graduate degree in economics are encouraged to take either

ECON 135 or STAT 241 and 242, followed by ECON 136. Prospective majors are urged to start their econometrics sequence in the fall of sophomore year.

**Intermediate microeconomics and macroeconomics** Along with econometrics, intermediate microeconomics and macroeconomics form the core of the major. Two options are available in both microeconomics and macroeconomics. The standard intermediate courses are ECON 121 and 122. Students with a stronger mathematics background are encouraged to take ECON 125 and 126 instead. The intermediate courses need not be taken in sequence: in particular, ECON 125 is not required for 126.

**Field courses** The department offers a wide selection of upper-level courses that explore in greater detail material presented in introductory courses. Advanced fields of economics include theoretical, quantitative, and mathematical economics; market organization; human resources; finance; international and development economics; public policy and the public sector; and economic history. Some advanced field courses have only introductory microeconomics as a prerequisite. Others apply intermediate-level theory or econometrics to economic problems and institutions, and for this reason list one or more of the theory or econometrics courses as prerequisites.

**Advanced lecture courses** Advanced lecture courses, numbered ECON 400–449, are limited-enrollment courses that cover relatively advanced material in more depth than regular field courses. Prerequisites usually include two of intermediate microeconomics, intermediate macroeconomics, and econometrics or a mathematics course such as MATH 120. Advanced lecture courses may be applied toward the senior requirement. While these courses vary in approach, they share features of other Economics courses: like field courses, they devote some time to traditional lecturing, and like seminars, they emphasize class interaction, the writing of papers, and the reading of journal articles.

**Seminars** Although there is diversity in approaches in the various seminars (courses numbered ECON 450–489), all have in common an emphasis on class interaction, the writing of papers, and the reading of journal articles. Seminars represent an opportunity for students to apply and extend the economics they have learned through their earlier coursework.

Enrollment in seminars and advanced lecture courses is limited. Senior Economics majors who have not yet completed the senior requirement for the major are given priority for these courses and may preregister; see the departmental Web site (<http://economics.yale.edu/undergraduate-program>) for instructions. Students must take two of three core courses in intermediate microeconomics, intermediate macroeconomics, and econometrics before enrolling in a seminar. Underclassmen in the major and nonmajors may also enroll in Economics seminars and advanced lecture courses as space permits, but they do not preregister.

**Senior requirement** Majors are required to take two departmental courses numbered ECON 400–491, at least one of which must be taken in the senior year. The senior requirement must be met by Yale Economics courses; courses in other departments or taken elsewhere do not suffice.

**Senior essay** Only those majors who submit a senior essay are eligible for Distinction in the Major. There are three types of senior essay: (1) students may write a one-term essay in the fall of the senior year as an independent project on a topic of their

own design under the close and regular supervision of a faculty adviser (ECON 491); (2) students may write a two-term essay starting in the fall of the senior year as an independent project on a topic of their own design under the close and regular supervision of a faculty adviser (ECON 491 and 492); or (3) students may write a one-term essay in an advanced departmental course (numbered 400–489) taken during the fall term of the senior year, with the option of completing the essay in the spring of the senior year as an independent project under the close and regular supervision of a faculty adviser (ECON 492); under this option the instructor of the advanced departmental course taken in the fall term typically serves as the faculty adviser.

Note that the essay must be written during the senior year and that students may submit a senior essay only if they have an approved prospectus and a senior essay adviser. Senior essays that are not submitted on time will receive a grade of Incomplete. Senior essays with grades of Incomplete without permission of the residential college dean are subject to grade penalties when submitted.

Meetings for seniors to discuss the senior essay will be held on Wednesday, August 27, at 4:30 p.m. and Thursday, August 28, at 1:30 p.m. in Room 106, 28 Hillhouse Avenue. Details regarding calculations for Distinction in the Major will be discussed in these meetings, and senior essay guidelines will be distributed. Senior essay prospectus forms are due Monday, September 29, 2014.

**Distinction in the Major** To be considered for Distinction, students must meet the appropriate grade standards as described in this bulletin under Honors (p. 30) and submit a senior essay to the Economics department. Students who fail to submit an essay will not be considered for Distinction in the Major. Grade computation for Distinction does not include the introductory economics courses, the required mathematics course, or courses taken outside Yale.

**Graduate courses** Well-qualified students who have acquired the requisite background in undergraduate courses may, with written permission of the instructor, the director of undergraduate studies, and the director of graduate studies, be admitted to graduate courses and seminars. Descriptions of courses are available in the Economics department office.

Students who are planning graduate work in economics should take additional mathematics courses beyond the one-term course required for the major. Many graduate programs in economics require courses in multivariate calculus and linear algebra. Students are urged to discuss their plans for graduate work with the director of undergraduate studies as early in their college careers as possible.

**Faculty representatives** The Economics department has faculty representatives associated with each residential college. Students majoring in Economics should secure written approval of their course selection from one of their college representatives. Changes in their major program must be approved by a representative. Questions

concerning the major or programs of study should be directed to a college representative. For 2014–2015 the college representatives are as follows:

BK	S. Berry, E. Weese	MC	M. Rosenzweig, A. Smith
BR	K. Meghir, J. Shapiro	PC	D. Bergemann, M. Peters
CC	A. Kowalski, W. Nordhaus	SY	T. Bewley, J. Espin-Sanchez
DC	D. Keniston, Y. Kitamura	SM	C. Arkolakis, K. Rozen
TD	N. Lamoreaux, N. Ryan	ES	J. Geanakoplos, G. Maggi
JE	R. Fair, P. Goldberg	TC	L. Samuelson, A. Tsyvinski

## REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 term courses (incl senior req)

**Distribution of courses** 1 intro course in microeconomics, 1 in macroeconomics (or equivalents with DUS permission); 1 math course, as specified

**Specific courses required** ECON 121 or 125; ECON 122 or 126; ECON 131, 132, or 136

**Substitution permitted** 1 related course in another dept, with DUS approval

**Senior requirement** 2 courses numbered ECON 400–491, at least 1 in senior year

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## Introductory Courses

\* **ECON 108a or b, Quantitative Foundations of Microeconomics** Staff

Introductory microeconomics with a special emphasis on quantitative methods and examples. Intended for students with limited or no experience with calculus. Enrollment limited. Online preregistration is required; visit [economics.yale.edu/undergraduate-program](http://economics.yale.edu/undergraduate-program) for more information. May not be taken after ECON 110 or 115. QR, SO

\* **ECON 110a, An Introduction to Microeconomic Analysis** Staff

Similar to ECON 115, but taught as a lecture discussion with limited enrollment. Enrollment limited to freshmen. Online preregistration is required; visit [economics.yale.edu/undergraduate-program](http://economics.yale.edu/undergraduate-program) for more information. May not be taken after ECON 108 or 115. QR, SO

\* **ECON 111b, An Introduction to Macroeconomic Analysis** Staff

Similar to ECON 116, but taught as a lecture discussion with limited enrollment. Enrollment limited to freshmen. Online preregistration is required; visit [economics.yale.edu/undergraduate-program](http://economics.yale.edu/undergraduate-program) for more information. May not be taken after ECON 116. Prerequisite: ECON 108, 110, or 115. SO

**ECON 115a or b, Introductory Microeconomics** Staff

An introduction to the basic tools of microeconomics to provide a rigorous framework for understanding how individuals, firms, markets, and governments allocate scarce resources. The design and evaluation of public policy. May not be taken after ECON 108 or 110. QR, SO

**ECON 116a or b, Introductory Macroeconomics** Staff

An introduction that stresses how the macroeconomy works, including the determination of output, unemployment, inflation, interest rates, and exchange rates.

Economic theory is applied to current events. May not be taken after ECON 111.

Prerequisite: ECON 108, 110, or 115. SO

## Intermediate Courses

### **ECON 121a or b, Intermediate Microeconomics** Staff

The theory of resource allocation and its applications. Topics include the theory of choice, consumer and firm behavior, production, price determination in different market structures, welfare, and market failure. After introductory microeconomics and completion of the mathematics requirement for the major or its equivalent. Elementary techniques from multivariate calculus are introduced and applied, but prior knowledge is not assumed. May not be taken after ECON 125. QR, SO

### \* **ECON 122a or b, Intermediate Macroeconomics** Staff

Contemporary theories of employment, finance, money, business fluctuations, and economic growth. Their implications for monetary and fiscal policy. Emphasis on empirical studies, financial and monetary crises, and recent policies and problems. Enrollment limited in the fall term. After two terms of introductory economics and completion of the mathematics requirement for the major or its equivalent. May not be taken after ECON 126. QR, SO

### **ECON 125a, Microeconomic Theory** Karen Rozen

Similar to ECON 121 but with a more intensive treatment of consumer and producer theory, and covering additional topics including choice under uncertainty, game theory, contracting under hidden actions or hidden information, externalities and public goods, and general equilibrium theory. Recommended for students considering graduate study in economics. After introductory economics, and MATH 118 or 120 or equivalent. May not be taken after ECON 121. QR, SO

### \* **ECON 126b, Macroeconomic Theory** Anthony Smith

Similar to ECON 122 but with a more intensive treatment of the mathematical foundations of macroeconomic modeling, and with rigorous study of additional topics. Recommended for students considering graduate study in economics. After two terms of introductory economics, and MATH 118 or 120 or equivalent. May not be taken after ECON 122. QR, SO

## Econometrics and Statistics Courses

### **ECON 131a or b, Econometrics and Data Analysis I** Staff

Basic probability theory and statistics, distribution theory, estimation and inference, bivariate regression, introduction to multivariate regression, introduction to statistical computing. After introductory microeconomics and MATH 112 or equivalent. QR, SO

### **ECON 132a or b, Econometrics and Data Analysis II** Staff

Continuation of ECON 131, with a focus on multivariate regression. Topics include statistical inference, choice of functional form, heteroskedasticity, serial correlation, two-stage least squares, qualitative choice models, time series models, and forecasting. Emphasis on statistical computing and the mechanics of how to conduct and present empirical research. After two terms of introductory economics, completion of the mathematics requirement for the major, and ECON 131 or 135 or a course in the STAT 101–106 series. QR, SO

**ECON 135a, Introduction to Probability and Statistics** Staff

Foundations of mathematical statistics: probability theory, distribution theory, parameter estimation, hypothesis testing, regression, and computer programming. Recommended for students considering graduate study in economics. After introductory microeconomics and either (1) MATH 118; or (2) MATH 120 and either MATH 222 or MATH 225. QR, SO

**ECON 136b, Econometrics** Yuichi Kitamura

Continuation of ECON 135 with a focus on econometric theory and practice: problems that arise from the specification, estimation, and interpretation of models of economic behavior. Topics include classical regression and simultaneous equations models; panel data; and limited dependent variables. Recommended for students considering graduate study in economics. After ECON 135 or STAT 241 and 242. QR, SO

**Field Courses****ECON 159a, Game Theory** Zvika Neeman

An introduction to game theory and strategic thinking. Ideas such as dominance, backward induction, Nash equilibrium, evolutionary stability, commitment, credibility, asymmetric information, adverse selection, and signaling are applied to games played in class and to examples drawn from economics, politics, the movies, and elsewhere. After introductory microeconomics. No prior knowledge of game theory assumed. QR, SO

**ECON 170a, Health Economics and Public Policy** Howard Forman

Application of economic principles to the study of the U.S. health care system. Emphasis on basic principles about the structure of the U.S. system, current problems, proposed solutions, and the context of health policy making and politics. After introductory microeconomics. SO

**ECON 182b / HIST 135b, American Economic History** Staff

The growth of the American economy since 1790, both as a unique historical record and as an illustration of factors in the process of economic development. The American experience viewed in the context of its European background and patterns of industrialization overseas. After introductory microeconomics. WR, SO

**ECON 184b / GLBL 234b, International Economics** Peter Schott

Introduction to conceptual tools useful for understanding the strategic choices made by countries, firms, and unions in a globalized world. After two terms of introductory economics. SO

**ECON 185a / GLBL 237a, Debates in Macroeconomics** Aleh Tsyvinski

Introduction to current theoretical and practical debates in macroeconomics. In-class debates between the instructors on topics such as economic crises, fiscal and monetary policy, inflation, debt, and financial regulations. Prerequisites: introductory microeconomics and macroeconomics. SO

**[ ECON 186, European Economic History, 1700–1815 ]****ECON 251a, Financial Theory** John Geanakoplos

Capital asset pricing model, arbitrage pricing theory, option pricing, social security, operation of security exchanges, investment banks, securitization, mortgage derivatives, interest rate derivatives, hedge funds, financial crises, agency theory, and financial incentives. After introductory microeconomics. QR, SO



## [ ECON 275, Public Economics ]

## [ ECON 280, Poverty under Postindustrial Capitalism ]

**ECON 325b, Economics of Developing Countries** Christopher Udry

Analysis of current problems of developing countries. Emphasis on the role of economic theory in informing public policies to achieve improvements in poverty and inequality, and on empirical analysis to understand markets and responses to poverty. Topics include microfinance, education, health, agriculture, intrahousehold allocations, gender, and corruption. After introductory microeconomics. SO

## [ ECON 327, The Economics of Poverty Alleviation ]

**ECON 330b / EVST 340b, Economics of Natural Resources** Robert Mendelsohn

Microeconomic theory brought to bear on current issues in natural resource policy. Topics include regulation of pollution, hazardous waste management, depletion of the world's forests and fisheries, wilderness and wildlife preservation, and energy planning. After introductory microeconomics. QR, SO

\* **ECON 331a, The Economics of Energy and Climate Change** William Nordhaus

The essentials of energy and environmental economics, with applications. Analysis of core topics in public goods, intertemporal choice, uncertainty, decision theory, and exhaustible resources. Applications include energy security, nuclear power, the relationship between nuclear power and nuclear proliferation, and climate change. Enrollment limited. Prerequisite: two terms of introductory economics. SO

**ECON 338a / EAST 338a / GLBL 318a, The Next China** Stephen Roach

Economic development in China since the late 1970s. Emphasis on factors pushing China toward a transition from its modern export- and investment-led development model to a pro-consumption model. The possibility of a resulting identity crisis, underscored by China's need to embrace political reform and by the West's long-standing misperceptions of China. Prerequisite: introductory macroeconomics. SO

**ECON 350a, Mathematical Economics: General Equilibrium Theory** Truman Bewley

An introduction to general equilibrium theory and its extension to equilibria involving uncertainty and time. Discussion of the economic role of insurance and of intertemporal models, namely, the overlapping generations model and the optimal growth theory model. Recommended for students considering graduate study in economics. After MATH 118 or 120, and intermediate microeconomics. QR, SO

**ECON 351b, Mathematical Economics: Game Theory** Johannes Horner

Introduction to game theory and choice under uncertainty. Analysis of the role of information and uncertainty for individual choice behavior, as well as application to the decision theory under uncertainty. Analysis of strategic interaction among economic agents, leading to the theory of auctions and mechanism design. Recommended for students considering graduate study in economics. After MATH 118, 120, and intermediate microeconomics. QR, SO

## [ ECON 371, Financial Time Series Econometrics ]

**Advanced Lecture Courses**

Senior Economics majors may preregister for advanced lecture courses; see the departmental Web site (<http://economics.yale.edu/undergraduate-program>) for

instructions. Other interested students may enroll with permission of the instructor during the course selection period.

\* **ECON 405b, Economics of Health and Health Care** Amanda Kowalski  
Economic principles and empirical methods applied to issues in health economics. Discussion of policies to address market failures in health care markets. Consumer behavior in medical markets, valuing medical improvements, and evaluating health insurance reform. Prerequisites: intermediate microeconomics and econometrics. SO

\* **ECON 407b / GLBL 310b, International Finance** Konstantinos Arkolakis  
A study of how consumers and firms are affected by the globalization of the world economy. Topics include trade costs, the current account, exchange rate pass-through, international macroeconomic co-movement, multinational production, and gains from globalization. Prerequisite: intermediate macroeconomics or equivalent. SO

\* **ECON 408a / GLBL 238a, International Trade Policy** Giovanni Maggi  
Analysis of issues concerning international trade policy and agreements, including recent academic research. Welfare analysis of trade policy; the political economy of trade policy; international trade agreements. Attention to both theoretical methods and empirical research. Prerequisites: intermediate microeconomics and ECON 184. SO

**ECON 409a, Firms, Markets, and Competition** Evangelia Chalioti  
Analysis of imperfectly competitive markets, focusing on the interactions among firm behavior, market structure, and market outcomes. Topics include oligopoly, collusion, predation, firm entry, advertising, and price discrimination as well as public policy implications of market behavior. After intermediate microeconomics or equivalent. QR, SO

\* **ECON 410b, The Economics of Innovation** Staff  
Study of forces that drive the process of innovation. Creativity and creative destruction; the innovator's dilemma; incentives to innovate; competitive advantage; industry evolution; intellectual property. Use of both formal theoretical models and quantitative empirical studies, as well as descriptive studies from management strategy and economic history. Prerequisites: econometrics and intermediate microeconomics.

\* **ECON 411a, Economics of Uncertainty and Information** Staff  
Individual and collective choice in the presence of uncertainty and asymmetric information. Implications of such decision making for economic phenomena. Basic analytical tools for studying decisions under uncertainty. Asset markets, adverse selection, screening, signaling, moral hazard, incomplete contracts, bilateral trade with asymmetric information, and mechanism design. Prerequisites: intermediate microeconomics and econometrics. SO

\* **ECON 412a, International Environmental Economics** Joseph Shapiro  
Introduction to international and environmental economics and to research that combines the two fields. Methods for designing and analyzing environmental policy when economic activity and pollution cross political borders. Effects of market openness on the environment and on environmental regulation; international economics and climate change. Prerequisites: intermediate microeconomics and econometrics. SO

## Seminars

Senior Economics majors may preregister for departmental seminars; see the departmental Web site (<http://economics.yale.edu/undergraduate-program>) for instructions. Other interested students may enroll with permission of the instructor during the course selection period.

**\* ECON 450a, Investment Analysis** Dean Takahashi

Examination of investment management in theory and practice. Discussion of asset allocation, investment strategy, and manager selection from the perspective of an institutional investor. Focus on the degree of market efficiency and opportunity for generating attractive returns. SO

**\* ECON 452b / EP&E 300b / GLBL 302b, Contemporary Issues in Energy Policy**

Ioannis Kessides

Overview of challenges in the global energy framework generated by concerns about energy security and climate change; public policies necessary for addressing these issues. Potential contributions and limitations of existing, improved or transitional, and advanced technologies. SO

**\* ECON 456a, Private Equity Investing** Michael Schmeztler

A case-oriented study of principal issues and investment types found in substantial private equity portfolios. Discussion of enterprise valuation, value creation, business economics, negotiation, and legal structure, based on primary source materials and original cases. Prerequisites: intermediate microeconomics and econometrics. SO

**[ ECON 461, Economics, Addiction, and Public Policy ]**

**\* ECON 462b / EP&E 228b / GLBL 316b / LAST 410b, The Economics of Human**

**Capital in Latin America** Douglas McKee

Economic issues related to a population's education, skills, and health; focus on contemporary Latin American societies. Determinants of health and education; evaluation of human capital development policies; the role of human capital in a variety of economic contexts, including the labor market, immigration, child investment, intrahousehold bargaining, inequality, and poverty. Prerequisites: intermediate microeconomics and econometrics. SO

**\* ECON 464a / AFST 464a, The Economics of Africa** Cheryl Doss

Study of key microeconomic issues facing African economies and of the economic tools used to analyze such issues. Topics include infrastructure, land, agriculture, conflict, intrahousehold issues, health and education, microfinance and risk, and coping strategies. Readings from recent literature in microeconomic development. Prerequisites: intermediate microeconomics and econometrics. SO

**\* ECON 465a / EP&E 224a / GLBL 330a, Debating Globalization** Ernesto Zedillo

Facets of contemporary economic globalization, including trade, investment, and migration. Challenges and threats of globalization: inclusion and inequality, emerging global players, global governance, climate change, and nuclear weapons proliferation. Prerequisite: background in international economics and data analysis. Preference to seniors majoring in Economics or EP&E. SO RP

**[ ECON 466, Economics of Aging ]**

\* **ECON 467b / GBLB 307b, Economic Evolution of the Latin American and Caribbean Countries** Ernesto Zedillo

Economic evolution and prospects of the Latin American and Caribbean (LAC) countries. Topics include the period from independence to the 1930s; import substitution and industrialization to the early 1980s; the debt crisis and the "lost decade"; reform and disappointment in the late 1980s and the 1990s; exploration of selected episodes in particular countries; and speculations about the future.

Prerequisites: intermediate microeconomics and macroeconomics. SO

\* **ECON 468b, Institutions and Incentives in Economic Development** Eric Weese

Assessment of alternative policies and programs designed to promote economic development; examination of fundamental problems of underdeveloped areas and consideration of how and whether such programs resolve them. The roles of indigenous institutions in low-income countries in alleviating problems of underdevelopment.

Preregistration for junior and senior Economics majors, held in Room 101, 28 Hillhouse Ave., is required during the designated sign-up period. Prerequisites: intermediate microeconomics and econometrics. SO

\* **ECON 471b, Topics in Cooperative Game Theory** Pradeep Dubey

The theory and applications of cooperative games. Topics include matching, bargaining, cost allocation, market games, voting games, and games on networks.

Prerequisite: intermediate microeconomics.

[ **ECON 472, Evaluating Charitable Organizations** ]

[ **ECON 473, Equality** ]

\* **ECON 474b / EAST 454b / GBLB 312b, Economic and Policy Lessons from Japan** Stephen Roach

An evaluation of Japan's protracted economic problems and of their potential implications for other economies, including the United States, Europe, and China. Currency pressures, policy blunders, Abenomics, bubbles, and the global economic crisis of 2008; dangers to the global economy from a protracted postcrisis recovery period. Focus on policy remedies to avert similar problems in other countries.

Prerequisite: a course in macroeconomics. SO

\* **ECON 475b / EP&E 286b, Discrimination in Law, Theory, and Practice** Gerald Jaynes

How law and economic theory define and conceptualize economic discrimination; whether economic models adequately describe behaviors of discriminators as documented in court cases and government hearings; the extent to which economic theory and econometric techniques aid our understanding of actual marketplace discrimination. Prerequisites: introductory microeconomics and at least one additional course in Economics, African American Studies, Ethnicity, Race, and Migration, or Women's, Gender, and Sexuality Studies.

\* **ECON 478b, Bounded Rationality** Kareen Rozen

Introduction to decision theory, which emphasizes the limitations individuals face when making economic decisions. The imperfect ability of decision makers to reason and remember, to calculate with precision, and to ignore the context or framing of a problem. Defining economic rationality; deviations from rationality and their influence

on markets; approaches to modeling bounded rationality. Prerequisite: intermediate microeconomics.

**\* ECON 489a, Auctions and Bidding** Staff

Introduction to the theory of auctions and competitive bidding. Auction formats and their relation to strategies used by bidders and sellers. Topics include the revenue equivalence theorem, optimal auctions, the winner's curse, double auctions, auctions of multiple objects, and collusion. Prerequisite: intermediate microeconomics.

## Senior Essay and Directed Reading Courses

**\* ECON 491a and ECON 492b, The Senior Essay** Samuel Kortum

Students deciding to write one-term senior essays by enrolling in ECON 491, or two-term senior essays by enrolling in ECON 491 and 492, must choose their topics and advisers by Monday, September 29, 2014. One-term senior essays are due at the end of the last week of classes in the fall term. Two-term senior essays are due by 4:30 p.m. on Wednesday, April 1, 2015. Students writing senior essays who would like to be considered for Distinction in the Major must submit three copies of their essay to the Economics department office by 4:30 p.m. on Wednesday, April 1, 2015. Advisers are chosen with the assistance of the director of undergraduate studies. The format and character of the departmental senior essay may vary to suit the interest of the student and the demands of the topic, but it is expected that the tools and concepts of economic analysis will be employed and that the essay will contain original research. Paper lengths may vary; the normal expectation is thirty pages. Students may receive up to two credits for the senior essay, though it counts as only one departmental seminar whether one or two terms are taken. Meetings for seniors to discuss the senior essay will be held on Wednesday, August 27, at 4:30 p.m. and Thursday, August 28, at 1:30 p.m. in Room 106, 28 Hillhouse Avenue. Seniors planning to write either a one-term or a two-term senior essay should attend one of these meetings. Details regarding calculation of Distinction will be discussed and senior essay guidelines will be distributed.

**\* ECON 498a and ECON 499b, Directed Reading** Samuel Kortum

Students desiring a directed reading course in special topics in economics not covered in other graduate or undergraduate courses may elect this course, usually not more than once, with written permission of the director of undergraduate studies and of the instructor. The instructor meets with the student regularly, typically for an hour a week, and the student writes a paper or a series of short essays. Does not meet the requirement for a departmental seminar.

## Economics and Mathematics

Directors of undergraduate studies: Samuel Kortum (Economics), Rm. 305, 28 Hillhouse Ave., 432-6217 or 432-3574, qazi.azam@yale.edu; Andrew Casson (Mathematics), 216 LOM, 432-7056, andrew.casson@yale.edu

The Economics and Mathematics major is intended for students with a strong intellectual interest in both mathematics and economics and for students who may pursue a graduate degree in economics.

**Prerequisites** The major has prerequisites in both mathematics and economics: MATH 120; ECON 110 or 115; and ECON 111 or 116. With permission of the directors of undergraduate studies, upper-level courses may be substituted for prerequisite courses. Upper-level courses substituted for prerequisites do not count toward the total of twelve term courses (beyond the introductory level in economics and mathematics) required for the major.

**Requirements of the major** A total of twelve term courses is required beyond the introductory level in economics and in mathematics: seven term courses in economics and five term courses in mathematics. These courses must include:

1. One intermediate microeconomics course chosen from ECON 121 or 125, and one intermediate macroeconomics course chosen from ECON 122 or 126
2. A year of mathematical economics, ECON 350 and 351
3. Two courses in econometrics, ECON 135 and 136 (with permission of the director of undergraduate studies in Economics, STAT 241 and 242 may be taken instead of ECON 135, in which case they count as one economics course and not as mathematics courses)
4. A course in linear algebra, MATH 222 or 225 (or 230 and 231, for two course credits)
5. An introductory course in analysis, MATH 300 or 301
6. The senior seminar in mathematics, MATH 480

**Credit/D/Fail** For students in the Class of 2016 and subsequent classes, courses taken Credit/D/Fail may not be counted toward the requirements of the major.

**Distinction in the Major** To be considered for Distinction in the Major, students must meet specified grade standards, as specified in the Undergraduate Curriculum section (p. 30), and submit a senior essay written either in an Economics department seminar or in ECON 491 or in ECON 491 and 492 to the Economics department; for details see under Economics (p. 247). (The paper must be written in a course taken in the senior year.) All courses beyond the introductory level in Mathematics and Economics are counted in the computation of grades for Distinction.

**Approval of program** Students interested in the major should consult both directors of undergraduate studies, and verify with each that their proposed program meets the relevant guidelines. Registration forms must be signed by both directors of undergraduate studies each term.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** MATH 120; ECON 110 or 115; ECON 111 or 116

**Number of courses** 12 term courses beyond prereqs (incl senior req)

**Distribution of courses** 5 courses in math and 7 in econ

**Specific courses required** ECON 121 or 125; ECON 122 or 126; ECON 135, 136, 350, 351; MATH 222 or 225 (or 230, 231); MATH 300 or 301

**Substitution permitted** STAT 241 and 242 for ECON 135, with permission of DUS in Econ

**Senior requirement** Senior sem in math (MATH 480); optional senior essay in Econ

# Education Studies

Director: Elizabeth Carroll, 111 SSS, 432-4631, [elizabeth.carroll@yale.edu](mailto:elizabeth.carroll@yale.edu);  
[yalecollege.yale.edu/content/education-studies](http://yalecollege.yale.edu/content/education-studies)

The undergraduate program in Education Studies provides a structure for students interested in educational institutions, policy, teaching, and learning. The program also promotes a multidisciplinary understanding of the role of education historically, socially, politically, and economically.

Any Yale College student interested in education may take the foundation course in education studies, EDST 110. This lecture course explores the historical, philosophical, and theoretical underpinnings of the field and helps students understand the critical role of education in society. The course examines aspects of education practice, research, and policy.

While Yale does not offer a teaching certificate program, students can apply to become a Yale Education Studies Undergraduate Scholar. The program selects students with appropriate background and interest in educational practice, research, and/or policy, and develops their experience and involvement in issues related to education.

The Education Studies Undergraduate Scholars program establishes an interdisciplinary cohort of scholars drawn from Yale College freshmen, sophomores, juniors, and seniors. Each Education Studies Scholar develops a course plan that advances the student's interests in an aspect of education studies, culminating in a capstone seminar. Education Studies Scholars gain practical experience through an appropriate academic-year or summer educational opportunity, and they explore educational topics through collaboration, colloquia, and advising relationships with mentors.

Students may apply to the Education Studies Undergraduate Scholars program in their freshman or sophomore year after they have successfully completed the foundation course, EDST 110. The application includes a statement of interest in some aspect of education research, practice, and/or policy; an official or unofficial transcript of courses taken at Yale; and a letter of reference from a Yale College faculty member supporting the student in terms of character, motivation, and academic promise.

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## Courses

### **EDST 110a, Foundations in Education Studies** Elizabeth Carroll

Introduction to key issues and debates in the U.S. public education system. Focus on the nexus of education practice, policy, and research. Social, scientific, economic, and political forces that shape approaches to schooling and education reform. Theoretical and practical perspectives from practitioners, policymakers, and scholars. SO

### \* **EDST 125a / CHLD 125a / PSYC 125a, Child Development**

Nancy Close and Carla Horwitz

The reading of selected material with supervised participant-observer experience in infant programs, a day-care and kindergarten center, or a family day-care program. Regularly scheduled seminar discussions emphasize both theory and practice. An

assumption of the course is that it is not possible to understand children – their behavior and development – without understanding their parents and the relationship between child and parents. The focus is on infancy as well as early childhood.

Enrollment limited to juniors and seniors. WR, SO

\* **EDST 127a / CHLD 127a / PSYC 127a, Theory and Practice of Early Childhood**

**Education: Implications of Curriculum and Policy** Carla Horwitz

Development of curricula for preschool children – infants through five-year-olds – in light of current research and child development theory. WR, SO RP

\* **EDST 128b / CHLD 128b / PSYC 128b, Language, Literacy, and Play**

Nancy Close and Carla Horwitz

The complicated role of play in the development of language and literacy skills among preschool-aged children. Topics include social-emotional, cross-cultural, cognitive, and communicative aspects of play. WR, SO RP

\* **EDST 191a, Clinical Child Development and Assessment of Young Children**

Nancy Close

Exposure to both conceptual material and clinical observations on the complexity of assessing young children and their families. SO ½ Course cr

\* **EDST 210a, Theory and Practice in American Education** Richard Hersh

Roles played by primary, secondary, and higher education in American society. The idealized purposes, nature, and value of education compared to actual practice. The goals of education at all levels; the degree to which such goals are being achieved.

Vocational vs. liberal education; the obligations and limits of formal education in helping students overcome social and economic inequities. Prerequisite: EDST 110. SO

\* **EDST 230b, American Education and the Law** William Garfinkel

Interactions between American primary-school education and the American legal system, with a focus on historical and contemporary case law. The relationship between schooling and the state; constitutional, statutory, and regulatory law governing the rights and responsibilities of educators, students, and parents; equal educational opportunity. Recommended preparation: EDST 110. Preference to Education Studies Scholars. SO

## Electrical Engineering

Director of undergraduate studies: Roman Kuc, 511 BCT, 432-4291,  
roman.kuc@yale.edu; seas.yale.edu/departments/electrical-engineering

### FACULTY OF THE DEPARTMENT OF ELECTRICAL ENGINEERING

**Professors** James Duncan, Jung Han, Peter Kindlmann (*Adjunct*), Roman Kuc, Tso-Ping Ma, A. Stephen Morse, Kumpati Narendra, Mark Reed, Peter Schultheiss (*Emeritus*), Hemant Tagare, Leandros Tassioulas, J. Rimas Vaišnys, Y. Richard Yang

**Associate Professors** Minjoo Lee, Richard Lethin (*Adjunct*), Lawrence Staib, Hongxing Tang, Sekhar Tatikonda

**Assistant Professors** Wenjun Hu, Amin Karbasi, Jakub Szefer, Fengnian Xia

Electrical Engineering broadly encompasses disciplines such as microelectronics, photonics, computer engineering, signal processing, control systems, and



communications, all of which enable and underpin a modern technological society. Three degree programs are offered that allow students to select the level of technical depth appropriate for individual goals. The B.A. in Engineering Sciences (Electrical) is suitable for a career outside technology, in which a student nevertheless benefits from an appreciation of electrical engineering perspectives. The B.S. in Engineering Sciences (Electrical) provides more technical exposure while retaining academic options outside the electrical engineering core area. The B.S. in Electrical Engineering, accredited by the Engineering Accreditation Commission of ABET, Inc., is appropriate for highly motivated students who are interested in learning the scientific fundamentals and the technologies and creative processes of contemporary electrical engineering.

The program's educational objectives prepare students for four potential paths. An academic path qualifies graduates to enter a top-tier graduate program conducting research with broad applications or significant consequences, and eventually to teach at an academic or research institution. Graduates following an industrial path can enter a managerial or policy-making position that provides significant value to a company. An entrepreneurial path allows graduates to bring broad knowledge to a startup company, which can deliver a device that meets societal needs. Graduates who elect a nontraditional engineering path might complete a professional program such as business, law, or medicine, to which their engineering knowledge can be applied.

Because the introductory courses are common to all three degree programs, students do not usually need to make a final choice before the junior year. An interdepartmental program with Computer Science (p. 269) is also offered, and students can pursue interdisciplinary studies in other areas of engineering and science.

**Prerequisites** All three degree programs require MATH 112, 115, ENAS 151 or MATH 120 or higher, ENAS 130 or CPSC 112 or higher, and PHYS 180, 181 or higher (PHYS 170, 171 is acceptable for the B.A. degree). Acceleration credits awarded on entrance can be used to satisfy the MATH 112 and 115 requirements. Students whose preparation exceeds the level of ENAS 151 or MATH 120 are asked to take a higher-level mathematics course instead, such as MATH 250. Similarly, students whose preparation at entrance exceeds the level of PHYS 180, 181 are asked to take higher-level physics courses instead, such as PHYS 200, 201. Students whose programming skills exceed the level of ENAS 130 or CPSC 112 are asked to take a more advanced programming course instead, such as CPSC 201; consult with the director of undergraduate studies.

**B.S. degree program in Electrical Engineering** The ABET-accredited B.S. in Electrical Engineering requires, beyond the prerequisites, four term courses in mathematics and science and thirteen term courses in topics in engineering. These courses include:

1. Mathematics and basic science (four term courses): ENAS 194; MATH 222 or 225; APHY 322 or equivalent; STAT 238, 241, or equivalent.
2. Electrical engineering and related subjects (thirteen term courses): EENG 200, 201, 202, 203, 310, 320, 325, 348, 481 (the senior project); and four engineering electives, at least three of which should be at the 400 level. MENG 390, CPSC 365, and all 400-level Computer Science courses qualify as ABET electives.

Each student's program must be approved by the director of undergraduate studies.

For students who have taken the equivalent of one year of calculus in high school, a typical ABET-accredited B.S. program might include:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
EENG 200	CPSC 112 or ENAS 130	APHY 322	EENG 481
EENG 201	EENG 202	EENG 310	Four electives
ENAS 151 or MATH 120	EENG 203	EENG 320	
MATH 222	ENAS 194	EENG 325	
PHYS 180	STAT 241	EENG 348	
PHYS 181			

For students who start with MATH 112, a typical ABET-accredited B.S. program might include:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
CPSC 112	EENG 200	EENG 202	APHY 322
EENG 201	ENAS 151 or MATH 120	EENG 203	EENG 481
MATH 112	ENAS 194	EENG 310	STAT 241
MATH 115	MATH 222	EENG 320	Four electives
	PHYS 180	EENG 325	
	PHYS 181	EENG 348	

Faster-paced and slower-paced variations are possible, depending on the student's level of preparation and commitment to the major; consult with the director of undergraduate studies.

**B.S. degree program in Engineering Sciences (Electrical)** This program requires fewer technical courses and allows more freedom for work in technical areas outside the traditional electrical engineering disciplines (e.g., economics or cognitive psychology). It requires thirteen technical term courses beyond the prerequisites, specifically: MATH 222 or 225; ENAS 194; EENG 200, 201, 202, 203; EENG 471 or, with permission of the director of undergraduate studies, 481 (the senior project); and six electives approved by the director of undergraduate studies, at least three of which must be at the 400 level.

For students who have taken the equivalent of one year of calculus in high school, a typical program for this degree might include:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
EENG 200	CPSC 112	Three electives	EENG 471
EENG 201	EENG 202		Three electives
ENAS 151 or MATH 120	EENG 203		
MATH 222	ENAS 194		
PHYS 180			
PHYS 181			

For students who start with MATH 112, a typical program for this degree might include:

Freshman	Sophomore	Junior	Senior
CPSC 112	EENG 200	EENG 202	EENG 471
EENG 201	ENAS 151 or MATH 120	EENG 203	Four electives
MATH 112	ENAS 194	Two electives	
MATH 115	MATH 222 PHYS 180 PHYS 181		

Faster-paced and slower-paced variations are possible, depending on the student's level of preparation and commitment to the major; consult with the director of undergraduate studies. The implied flexibility during the junior and senior years in the schedules above is often used to accommodate a second major, such as Economics (p. 247), or to master a related technical area, such as recent developments in biology or environmental studies.

**B.A. degree program in Engineering Sciences (Electrical)** This program is appropriate for those planning a career in fields such as business, law, or medicine where scientific and technical knowledge is likely to be useful. It requires eight technical term courses beyond the prerequisites, specifically: MATH 222 or 225, or ENAS 194; EENG 200, 201, 202, and 471 (the senior requirement); and three approved electives.

**Senior requirement** A research or design project carried out in the fall term of the senior year is required in all three programs. The student must take EENG 471 or 481, present a written report, and make an oral presentation. The written report is due in the departmental office by the last day of reading period. Arrangements to undertake a project in fulfillment of the senior requirement must be made by the end of the reading period of the preceding term, when a registration form (available from the departmental office), signed by the intended faculty adviser and the director of undergraduate studies, must be submitted.

**Approval of programs** All Electrical Engineering and Engineering Sciences majors must have their programs approved by the director of undergraduate studies. Arrangements to take EENG 471, 472, or 481 must be made during the term preceding enrollment in the course. Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

## REQUIREMENTS OF THE MAJOR ELECTRICAL ENGINEERING, B.S.

**Prerequisites** MATH 112, 115; ENAS 151 or MATH 120 or higher; ENAS 130 or CPSC 112 or higher; PHYS 180, 181 or higher

**Number of courses** 17 term courses beyond prereqs, incl senior req

**Specific courses required** ENAS 194; MATH 222 or 225; APHY 322; STAT 238 or 241; EENG 200, 201, 202, 203, 310, 320, 325, 348

**Distribution of courses** 4 engineering electives, 3 at 400 level

**Senior requirement** One-term design project (EENG 481)

**ENGINEERING SCIENCES (ELECTRICAL), B.S. AND B.A.**

**Prerequisites** *Both degrees*—MATH 112, 115; ENAS 151 or MATH 120 or higher; ENAS 130 or CPSC 112 or higher; *B.S.*—PHYS 180, 181 or higher; *B.A.*—PHYS 170, 171 or higher

**Number of courses** *B.S.*—13 term courses beyond prereqs, incl senior req; *B.A.*—8 term courses beyond prereqs, incl senior req

**Specific courses required** *B.S.*—ENAS 194; MATH 222 or 225; EENG 200, 201, 202, 203; *B.A.*—1 from ENAS 194 or MATH 222 or 225; EENG 200, 201, 202

**Distribution of courses** *B.S.*—6 electives approved by DUS, 3 at 400 level; *B.A.*—3 electives approved by DUS

**Senior requirement** *B.S.*—one-term research or design project (EENG 471 or, with permission of DUS, 481); *B.A.*—one-term research or design project (EENG 471)

**Courses****EENG 200a, Introduction to Electronics** Minjoo Lee and Mark Reed

Introduction to the basic principles of analog and digital electronics. Analysis, design, and synthesis of electronic circuits and systems. Topics include current and voltage laws that govern electronic circuit behavior, node and loop methods for solving circuit problems, DC and AC circuit elements, frequency response, nonlinear circuits, semiconductor devices, and small-signal amplifiers. A lab session approximately every other week. After or concurrently with MATH 115 or equivalent. QR

**EENG 201b, Introduction to Computer Engineering** Jakub Szefer

Introduction to the theoretical principles underlying the design and programming of simple processors that can perform algorithmic computational tasks. Topics include data representation in digital form, combinational logic design and Boolean algebra, sequential logic design and finite state machines, and basic computer architecture principles. Hands-on laboratory involving the active design, construction, and programming of a simple processor. QR

**EENG 202a, Communications, Computation, and Control** Sekhar Tatikonda

Introduction to systems that sense, process, control, and communicate. Topics include communication systems (compression, channel coding); network systems (network architecture and routing, wireless networks, network security); estimation and learning (classification, regression); and signals and systems (linear systems, Fourier techniques, bandlimited sampling, modulation). MATLAB programming and laboratory experiments illustrate concepts. Prerequisite: MATH 115. QR

**EENG 203b, Circuits and Systems Design** Hongxing Tang and Fengnian Xia

Introduction to design in a laboratory setting. A wide variety of practical systems are designed and implemented to exemplify the basic principles of systems theory. Systems include audio filters and equalizers, electrical and electromechanical feedback systems, radio transmitters and receivers, and circuits for sampling and reconstructing music. Prerequisites: EENG 200 and 202. QR RP

[ EENG 222, Nanotechnology ]

**EENG 310b, Signals and Systems** Kumpati Narendra

Concepts for the analysis of continuous and discrete-time signals including time series. Techniques for modeling continuous and discrete-time linear dynamical systems including linear recursions, difference equations, and shift sequences. Topics include continuous and discrete Fourier analysis, Laplace and Z transforms, convolution, sampling, data smoothing, and filtering. Prerequisite: MATH 115. Recommended preparation: EENG 202. QR

**\* EENG 320a, Introduction to Semiconductor Devices** Mark Reed

An introduction to the physics of semiconductors and semiconductor devices. Topics include crystal structure; energy bands in solids; charge carriers with their statistics and dynamics; junctions, p-n diodes, and LEDs; bipolar and field-effect transistors; and device fabrication. Additional lab one afternoon per week. Prepares for EENG 325 and 401. Prerequisites: PHYS 180 and 181 or permission of instructor. Recommended preparation: EENG 200. QR, SC

**EENG 325a, Electronic Circuits** Fengnian Xia

Models for active devices; single-ended and differential amplifiers; current sources and active loads; operational amplifiers; feedback; design of analog circuits for particular functions and specifications, in actual applications wherever possible, using design-oriented methods. Includes a team-oriented design project for real-world applications, such as a high-power stereo amplifier design. Electronics Workbench is used as a tool in computer-aided design. Additional lab one afternoon per week. Prerequisite: EENG 200. QR RP

**EENG 348a, Digital Systems** Roman Kuc

Development of engineering skills through the design and analysis of digital logic components and circuits. Introduction to gate-level circuit design, beginning with single gates and building up to complex systems. Hands-on experience with circuit design using computer-aided design tools and microcontroller programming. Recommended preparation: EENG 201. QR

**EENG 397b / ENAS 397b, Mathematical Methods in Engineering** J. Rimas Vaišnys

Exploration of several areas of mathematics useful in science and engineering; recent approaches to problem solving made possible by developments in computer software. Mathematica and Eureka are used to investigate and solve problems involving nonlinear differential equations, complex functions, and partial differential equations. Prerequisites: MATH 222, and ENAS 194 or MATH 246, or equivalents; familiarity with computer programming. QR

**EENG 401b / APHY 321b, Semiconductor Silicon Devices and Technology**

Tso-Ping Ma

Introduction to integrated circuit technology, theory of semiconductor devices, and principles of device design and fabrication. Laboratory involves the fabrication and analysis of semiconductor devices, including Ohmic contacts, Schottky diodes, p-n junctions, solar cells, MOS capacitors, MOSFETs, and integrated circuits. Prerequisite: EENG 320 or equivalent or permission of instructor. QR, SC

**EENG 406b, Photovoltaic Energy** Minjoo Lee

Survey of photovoltaic energy devices, systems, and applications, including review of optical and electrical properties of semiconductors. Topics include solar radiation, solar cell design, performance analysis, solar cell materials, device processing, photovoltaic

systems, and economic analysis. Prerequisite: EENG 320 or permission of instructor.

QR, SC

**EENG 408a, Electronic Materials: Fundamentals and Applications** Han Li

Survey and review of fundamental issues associated with modern microelectronic and optoelectronic materials. Topics include band theory, electronic transport, surface kinetics, diffusion, materials defects, elasticity in thin films, epitaxy, and Si integrated circuits. Prerequisite: EENG 320 or permission of instructor. QR, SC

\* **EENG 410a, Photonics and Optical Electronics** Hongxing Tang

A survey of the enabling components and devices that constitute modern optical communication systems. Focus on the physics and principles of each functional unit, its current technological status, design issues relevant to overall performance, and future directions. QR, SC

**EENG 412b, Energy Semiconductor Fundamentals** Jung Han

The fundamentals of properties and mechanisms in which conventional semiconductor physics intersect with emerging applications. Connections between electrical, mechanical, thermal, and optical properties; contemporary applications in energy, information, and technology. Prerequisite: APHY 448. SC

[ **EENG 425, Introduction to VLSI System Design** ]

[ **EENG 436, Systems and Control** ]

[ **EENG 438, Neural Networks for Pattern Recognition, Identification, and Control** ]

\* **EENG 442a / AMTH 342a, Linear Systems** A. Stephen Morse

Introduction to finite-dimensional, continuous, and discrete-time linear dynamical systems. Exploration of the basic properties and mathematical structure of the linear systems used for modeling dynamical processes in robotics, signal and image processing, economics, statistics, environmental and biomedical engineering, and control theory. Prerequisite: MATH 222 or permission of instructor. QR

**EENG 444a, Digital Communication Systems** Staff

Introduction to the fundamental theory underlying modern digital communication. Quantitative measures of information and data compression: the Huffman and Lempel-Ziv algorithms, scalar and vector quantization. Representations of signal waveforms: sampling, orthonormal expansions, waveforms as vectors in signal space. Transmission of signals through noisy channels; pulse amplitude and quadrature amplitude modulation, orthogonal signaling, signal design, noise processes, optimal detection, and error probability analysis. Applications to practical systems such as CD players, telephone modems, and wireless networks. Prerequisites: knowledge of signals and systems at the level of EENG 310; knowledge of basic probability at the level of STAT 241 (may be taken concurrently). QR

**EENG 445a / BENG 445a, Biomedical Image Processing and Analysis** James Duncan

A study of the basic computational principles related to processing and analysis of biomedical images (e.g., magnetic resonance, computed X-ray tomography, fluorescence microscopy). Basic concepts and techniques related to discrete image representation, multidimensional frequency transforms, image enhancement, motion analysis, image segmentation, and image registration. Prerequisite: BENG 352 or

EENG 310 or permission of instructors. Recommended preparation: familiarity with probability theory.

**\* EENG 449a, Computers for Cognition** Richard Lethin

Introduction to the development of computer architectures specialized for cognitive processing, including both offline 'thinking machines' and embedded devices. The history of machines, from early conceptions in defense systems to contemporary initiatives. Instruction sets, memory systems, parallel processing, analog architectures, probabilistic architectures. Application and algorithm characteristics. *Prerequisites:* EENG 201b, 325b, and CPSC 112a or b. QR

**EENG 454b / AMTH 364b / STAT 364b, Information Theory** Andrew Barron

Foundations of information theory in communications, statistical inference, statistical mechanics, probability, and algorithmic complexity. Quantities of information and their properties: entropy, conditional entropy, divergence, redundancy, mutual information, channel capacity. Basic theorems of data compression, data summarization, and channel coding. Applications in statistics and finance. After STAT 241. QR

**EENG 467a / ENAS 467a, Computer Organization and Architecture** Jakub Szefer

Introduction to computer architecture, including computer organization, microprocessors, caches and memory hierarchies, I/O, and storage. Issues surrounding performance, energy, and security; processor benchmarking. Selected readings from current academic literature. Prerequisite: EENG 201, or with permission of instructor. QR

**\* EENG 471a and EENG 472b, Advanced Special Projects** J. Rimantas Vaišnys

Faculty-supervised individual or small-group projects with emphasis on research (laboratory or theory), engineering design, or tutorial study. Students are expected to consult the director of undergraduate studies and appropriate faculty members about ideas and suggestions for suitable topics during the term preceding enrollment. These courses may be taken at any appropriate time during the student's career and may be taken more than once. Enrollment requires permission of both the instructor and the director of undergraduate studies, and submission to the latter of a one- to two-page prospectus signed by the instructor. The prospectus is due in the departmental office one day prior to the date that the student's course schedule is due.

**\* EENG 481a or b, Advanced ABET Projects** Staff

Study of the process of designing an electrical device that meets performance specifications, including project initiation and management, part specification, teamwork, design evolution according to real-world constraints, testing, ethics, and communication skills. Design project consists of electronic sensor, computer hardware, and signal analysis components developed by multidisciplinary teams. Prerequisites: EENG 310, 320, 325, and 348. RP

## Electrical Engineering and Computer Science

Directors of undergraduate studies: Roman Kuc, (Electrical Engineering), 511 BCT, 432-4291, roman.kuc@yale.edu; James Aspnes (Computer Science), 401 AKW, 432-1232, james.aspnes@yale.edu

Electrical Engineering and Computer Science is an interdepartmental major designed for students who want to integrate work in these two fields. It covers discrete and

continuous mathematics, algorithm analysis and design, digital and analog circuits, signals and systems, systems programming, and computer engineering. It provides coherence in its core program, but allows flexibility to pursue technical electives.

The prerequisites for the major are MATH 112, 115, and ENAS 151 or MATH 120; CPSC 112; and PHYS 180 and 181, or 200 and 201. Acceleration credits may be used to satisfy some of these requirements. However, because the B.S. programs in Electrical Engineering and in Engineering Sciences (Electrical) both limit the use of such credits, students who wish to retain the option of switching to these programs should consult the director of undergraduate studies in Electrical Engineering when planning their course schedules.

The major requires fifteen term courses beyond the prerequisites: CPSC 201, 202, 223, 323, and 365; EENG 200, 201, 202, and 203; one from MATH 222, 225, or STAT 241; four advanced electives, two in electrical engineering, two in computer science; and a senior project. MATH 244 may be substituted for CPSC 202. Electives must be 300- or 400-level courses in the departments of Electrical Engineering (p. 262) and Computer Science (p. 210), or must be approved by the director of undergraduate studies in each department. Double-titled courses may be counted either way to fulfill this requirement. CPSC 480 and 490 may not be used as electives. With permission of the director of undergraduate studies in each department, EENG 471 or 472 may be used as an electrical engineering elective.

Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

For students who have taken the equivalent of one year of calculus in high school and have some programming experience, a typical program would be:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
EENG 200a	CPSC 201a	CPSC 202a	Senior project
ENAS 151a	EENG 202a	CPSC 323a	One elective
PHYS 180a			
EENG 201b	CPSC 223b	CPSC 365b	Two electives
PHYS 181b	EENG 203b	One elective	
	MATH 222b		

Students with no programming experience should take CPSC 112 in the fall of their freshman year and either postpone EENG 200 until their sophomore year or take ENAS 151 or MATH 120 in the spring.

For students with one term of calculus and no programming experience, a typical program would be:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
CPSC 112a	CPSC 201a	CPSC 202a	Two electives
MATH 115a	EENG 200a	CPSC 323a	
PHYS 180a	EENG 202a	STAT 241a	
EENG 201b	CPSC 223b	CPSC 365b	Senior project
MATH 120b	EENG 203b	One elective	One elective
PHYS 181b			



For students with no calculus and no programming experience, a typical program would be:

Freshman	Sophomore	Junior	Senior
CPSC 112a	CPSC 201a	CPSC 202a	Two electives
MATH 112a	EENG 200a	CPSC 323a	
PHYS 170a	ENAS 151a	EENG 202a	
EENG 201b	CPSC 223b	CPSC 365b	Senior project
MATH 115b	MATH 222b	EENG 203b	One elective
PHYS 171b		One elective	

Students who start with MATH 112 may satisfy the physics prerequisite by taking PHYS 170 and 171 in their freshman year, as shown in the table above. However, because the B.S. programs in Electrical Engineering and in Engineering Sciences (Electrical) do not allow this substitution, students who wish to retain the option of switching to these programs should postpone physics until their sophomore year.

**Senior requirement** The senior project must be completed in CPSC 490 or EENG 471 or 472, depending on the adviser's department, and must be approved by the director of undergraduate studies in each department.

**Approval of programs** The entire program of a student majoring in Electrical Engineering and Computer Science must be approved by the director of undergraduate studies in each department.

**Accreditation** Students interested in pursuing an ABET-accredited degree should consider the B.S. program in Electrical Engineering. See under Electrical Engineering (p. 262).

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** MATH 112, 115, and ENAS 151 or MATH 120; CPSC 112; PHYS 180, 181, or 200, 201 (PHYS 170, 171 is acceptable for students who need to take MATH 112)

**Number of courses** 15 term courses beyond prereqs (incl senior project)

**Specific courses required** CPSC 201, 202, 223, 323, and 365; EENG 200, 201, 202, and 203; one from MATH 222 or 225 or STAT 241

**Distribution of courses** 4 addtl 300- or 400-level electives, 2 in electrical engineering, 2 in comp sci

**Substitution permitted** MATH 244 for CPSC 202; advanced courses in other depts, with permission of DUS in each dept

**Senior requirement** Independent project (CPSC 490 or EENG 471 or 472) approved by DUS in each dept

## Energy Studies

Yale Climate & Energy Institute (YCEI) sponsors the Energy Studies Undergraduate Scholars program. The program promotes a multidisciplinary approach to the linked challenges of energy and climate, and provides students with training in the science and technology of energy, the environmental and social impacts of energy production and use, and the economics, planning, and regulation of energy systems and markets.

Energy Studies Scholars acquire the broad knowledge and skills needed for advanced studies and for leadership in energy-related fields.

In addition to their participation in the program, Energy Studies Scholars must complete the requirements of a Yale College major. Yale College does not offer a major in energy studies.

Admission to the Energy Studies Undergraduate Scholars program is by application, normally in the second term of the sophomore year. Accepted students are assigned an adviser from the YCEI faculty. Upon successful completion of the program, students receive a letter from YCEI acknowledging their participation in the program and are invited to attend the annual Yale Alumni in Energy Conference.

For additional information, including program requirements and application instructions, visit the YCEI Web site (<http://climate.yale.edu/prog-init/energy-studies>).

## Engineering

Dean of the School of Engineering & Applied Science: T. Kyle Vanderlick, 222 DL, 432-4200, [engineering@yale.edu](mailto:engineering@yale.edu); [seas.yale.edu](http://seas.yale.edu)

Engineering programs are offered in the departments of Biomedical Engineering, Chemical and Environmental Engineering, Electrical Engineering, and Mechanical Engineering and Materials Science. These departments are administered by the dean of the School of Engineering & Applied Science. The School also offers interdisciplinary courses bearing on engineering programs.

Curricula in Yale's undergraduate engineering programs range from technically intensive ones to those with lesser technical content that allow students considerable freedom to include courses of a nontechnical nature in their studies. Programs accredited by the Engineering Accreditation Commission of ABET, Inc., the accreditor for university programs in engineering, are the most intensive. ABET-accredited programs include B.S. degrees in Chemical Engineering, Electrical Engineering, and Mechanical Engineering.

Some students find that less intensive programs better meet their needs when considering a joint major and/or careers in fields requiring less comprehensive technical knowledge. Such non-ABET programs include the B.S. in Biomedical Engineering or Environmental Engineering and the B.S. in Engineering Sciences – Chemical, Electrical, or Mechanical – as well as the B.A. in Engineering Sciences – Electrical, Environmental, or Mechanical – designed for students planning careers in business, law, medicine, journalism, or politics who want their liberal arts education to include study of the impact science and technology have on society. A related major in Applied Mathematics is also available.

For engineering courses and descriptions of the major programs mentioned above, see under Applied Mathematics (p. 130), Biomedical Engineering (p. 168), Chemical Engineering (p. 174), Electrical Engineering (p. 262), Engineering and Applied Science (p. 273), Environmental Engineering (p. 298), and Mechanical Engineering (p. 501).

# Engineering and Applied Science

Director of undergraduate studies: Vincent Wilczynski, 238 DL, 432-4221,  
vincent.wilczynski@yale.edu

Courses in Engineering and Applied Science fall into three categories: those intended primarily for students majoring in one of the several engineering disciplines; those designed for students majoring in subjects other than engineering and the natural sciences; and those designed to meet common interests of students majoring in engineering or the natural sciences.

In the first category, the departments of Biomedical Engineering, Chemical and Environmental Engineering, Electrical Engineering, and Mechanical Engineering and Materials Science offer courses intended primarily for majors in engineering disciplines. Courses in these departments may also be relevant for students with appropriate backgrounds who are majoring in chemistry, physics, biology, geology and geophysics, mathematics, and computer science. For information about majors in engineering and their related courses, see under Biomedical Engineering (p. 168), Chemical Engineering (p. 174), Electrical Engineering (p. 262), Environmental Engineering (p. 298), and Mechanical Engineering (p. 501).

The School of Engineering and Applied Science (<http://seas.yale.edu>) is responsible for courses in the other two categories: technology for students majoring in subjects other than engineering and the natural sciences, and topics common to students majoring in engineering or the natural sciences. Courses for non-science majors are intended for all students seeking a broad perspective on issues of scientific and technological import, and they introduce students who may be planning careers in law, business, or public service to concepts and methods of engineering and applied science. Courses for science and engineering majors include topics in applied mathematics and computation.

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## Courses without Prerequisites in Engineering

\* **ENAS 100a / APHY 100a / EVST 100a / G&G 105a / PHYS 100a, Energy Technology and Society** Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non-science majors with strong backgrounds in math and science. Enrollment limited to 24. For application instructions, visit the course site on Classes\*v2 (<http://classesv2.yale.edu>). QR, SC

**ENAS 101b / ENVE 101b / EVST 105b / MENG 101b, Energy, Engines, and Environment** Alessandro Gomez

Energy sustainability and global warming; thermodynamic fundamentals; engines (combustion technologies, fossil-fuel pollution, carbon capture and sequestration). Wind, solar, biomass, and other renewable energy sources. Designed for freshmen and sophomores in science and engineering and for non-science majors. Prerequisite: A score of 4 or 5 on Advanced Placement examinations in mathematics and/or science.

SC

**\* ENAS 110b / APHY 110b, The Technological World** Victor Henrich

An exploration of modern technologies that play a role in everyday life, including the underlying science, current applications, and future prospects. Examples include solar cells, light-emitting diodes (LEDs), computer displays, the global positioning system, fiber-optic communication systems, and the application of technological advances to medicine. For students not committed to a major in science or engineering; no college-level science or mathematics required. Prerequisite: high school physics or chemistry. Enrollment limited to 90. For application instructions, visit the course site on Classes\*v2 (<http://classesv2.yale.edu>). QR, SC

**\* ENAS 118b, Introduction to Engineering, Innovation, and Design**

Eric Dufresne and Staff

An introduction to engineering, innovation, and design process. Principles of material selection, stoichiometry, modeling, data acquisition, sensors, rapid prototyping, and elementary microcontroller programming. Types of engineering and the roles engineers play in a wide range of organizations. Lectures are interspersed with practical exercises. Students work in small teams on an engineering/innovation project at the end of the term. Priority to freshmen. RP

**\* ENAS 120b / CENG 120b / ENVE 120b, Introduction to Environmental Engineering**

Jordan Peccia

Introduction to engineering principles related to the environment, with emphasis on causes of problems and technologies for abatement. Topics include air and water pollution, global climate change, hazardous chemical and emerging environmental technologies. Prerequisites: high school calculus and chemistry or CHEM 114, 115 (may be taken concurrently) or permission of instructor. QR, SC

**ENAS 335a / EP&E 204a, Professional Ethics** Mercedes Carreras

A theoretical and case-oriented approach to ethical decision making. Concepts, tools, and methods for constructing and justifying solutions to moral problems that students may face as professionals. SO

**ENAS 360b / ENVE 360b, Green Engineering and Sustainable Design** Staff

Study of green engineering, focusing on key approaches to advancing sustainability through engineering design. Topics include current design, manufacturing, and disposal processes; toxicity and benign alternatives; policy implications; pollution prevention and source reduction; separations and disassembly; material and energy efficiencies and flows; systems analysis; biomimicry; and life cycle design, management, and analysis. Prerequisites: CHEM 112, 113, or 114, 115, or permission of instructor.

## Applied Mathematics and Computation Courses

**ENAS 130b, Introduction to Computing for Engineers and Scientists** Roman Kuc

An introduction to the MATLAB and C programming languages for solving a variety of problems encountered in engineering, mathematics, and the natural sciences. General programming techniques, data analysis, numerical simulations, and transmission of data files between programs. Projects include processing and encrypting microphone speech and digital images. Prerequisite: MATH 115 or equivalent. Recommended preparation: previous programming experience. QR

**ENAS 151a or b / APHY 151a or b, Multivariable Calculus for Engineers** Staff

An introduction to multivariable calculus focusing on applications to engineering problems. Topics include vector-valued functions, vector analysis, partial differentiation, multiple integrals, vector calculus, and the theorems of Green, Stokes, and Gauss. Prerequisite: MATH 115 or equivalent. QR RP

**ENAS 194a or b / APHY 194a or b, Ordinary and Partial Differential Equations with Applications** Staff

Basic theory of ordinary and partial differential equations useful in applications. First- and second-order equations, separation of variables, power series solutions, Fourier series, Laplace transforms. Prerequisites: ENAS 151 or equivalent, and knowledge of matrix-based operations. QR RP

**ENAS 397b / EENG 397b, Mathematical Methods in Engineering** J. Rimas Vaišnys

Exploration of several areas of mathematics useful in science and engineering; recent approaches to problem solving made possible by developments in computer software. Mathematica and Eureka are used to investigate and solve problems involving nonlinear differential equations, complex functions, and partial differential equations. Prerequisites: MATH 222, and ENAS 194 or MATH 246, or equivalents; familiarity with computer programming. QR

**ENAS 440a / MENG 440a, Applied Numerical Methods I** Beth Anne Bennett

The derivation, analysis, and implementation of various numerical methods. Topics include root-finding methods, numerical solution of systems of linear and nonlinear equations, eigenvalue/eigenvector approximation, polynomial-based interpolation, and numerical integration. Additional topics such as computational cost, error analysis, and convergence are studied in several contexts throughout the course. Prerequisites: MATH 115, and 222 or 225, or equivalents; ENAS 130 or some knowledge of MATLAB, C++, or Fortran programming. QR RP

**ENAS 441b / MENG 441b, Applied Numerical Methods II** Beth Anne Bennett

The derivation, analysis, and implementation of numerical methods for the solution of ordinary and partial differential equations, both linear and nonlinear. Additional topics such as computational cost, error estimation, and stability analysis are studied in several contexts throughout the course. Prerequisites: MATH 115, and 222 or 225, or equivalents; ENAS 130 or some knowledge of MATLAB, C++, or Fortran programming; ENAS 194 or equivalent. ENAS 440 is not a prerequisite. QR RP

**ENAS 467a / EENG 467a, Computer Organization and Architecture** Jakub Szefer

Introduction to computer architecture, including computer organization, microprocessors, caches and memory hierarchies, I/O, and storage. Issues surrounding performance, energy, and security; processor benchmarking. Selected readings from current academic literature. Prerequisite: EENG 201, or with permission of instructor.

QR

**ENAS 496b, Probability and Stochastic Processes** Staff

A study of stochastic processes and estimation, including fundamentals of detection and estimation. Vector space representation of random variables, Bayesian and Neyman-Pearson hypothesis testing, Bayesian and nonrandom parameter estimation, minimum-variance unbiased estimators, and the Cramer-Rao bound. Stochastic processes. Linear prediction and Kalman filtering. Poisson counting process and renewal processes, Markov chains, branching processes, birth-death processes, and semi-

Markov processes. Applications from communications, networking, and stochastic control. QR RP

## English Language and Literature

Director of undergraduate studies: Jessica Brantley; associate director of undergraduate studies: R. John Williams; registrar: Erica Sayers, [erica.sayers@yale.edu](mailto:erica.sayers@yale.edu); acting assistant registrar: Jane Bordiere; 107 LC, 432-2224, [english.yale.edu/undergraduate-program](http://english.yale.edu/undergraduate-program)

### FACULTY OF THE DEPARTMENT OF ENGLISH

**Professors** Elizabeth Alexander, Harold Bloom, Leslie Brisman, David Bromwich, Ardis Butterfield, Jill Campbell, Janice Carlisle, Michael Denning, Wai Chee Dimock, Anne Fadiman (*Adjunct*), Roberta Frank, Paul Fry, Louise Glück (*Adjunct*), Jacqueline Goldsby, Langdon Hammer, Margaret Homans, Amy Hungerford, David Scott Kastan, Jonathan Kramnick, Traugott Lawler (*Emeritus*), Lawrence Manley, Donald Margulies (*Adjunct*), Stefanie Markovits, J. D. McClatchy (*Adjunct*), Alastair Minnis, Annabel Patterson (*Emeritus*), Linda Peterson, Caryl Phillips, David Quint, Claude Rawson (*Emeritus*), Joseph Roach, Marc Robinson, John Rogers, Caleb Smith, Robert Stepto, Katie Trumpener, Michael Warner, Ruth Yeazell

**Associate Professors** Jessica Brantley, Brian Walsh

**Assistant Professors** Ian Cornelius, Marta Figlerowicz, Benjamin Glaser, Paul Grimstad, Justin Neuman, Catherine Nicholson, Anthony Reed, Jill Richards, R. John Williams

**Senior Lecturers** James Berger, John Crowley, Michael Cunningham, Richard Deming, Fred Strebeigh, Cynthia Zarin

**Lecturers** Edward Ball, Steven Brill, Danielle Chapman, Andrew Ehrgood, Randi Epstein, Joseph Gordon, Rona Johnston Gordon, Karin Gosselink, Alfred Guy, Emily Hayman, Tom Hopkins, Briallen Hopper, Nalini Jones, Rosemary Jones, Heather Klemann, Verlyn Klinkenborg, Michael Komorowski, Timothy Kreiner, Penelope Laurans, John Loge, Allyson McCabe, Andrew McKendry, Rolf Potts, Timothy Robinson, Karin Roffman, Pamela Schirmeister, Adam Sexton, Shifra Sharlin, Kim Shirkhani, Joel Silverman, Alina Simone, Margaret Spillane, Michele Stepto, Barbara Stuart, Margaret Weisberg, Ryan Wepler, Christian Wiman, Bob Woodward, Carl Zimmer

The undergraduate program in English teaches students foundational research and writing skills and cultivates their powers of argument and analysis. Courses offered by the department are designed to develop students' understanding of important works of English, American, and world literatures in English; to provide historical perspectives from which to read and analyze these works; and to deepen students' insight into their own experience. For students interested in creative writing, the department offers an array of courses taught by renowned professional writers. Student writers at Yale work in all of the major genres, including fiction, poetry, play and film writing, nonfiction prose, and journalism, and they often enjoy the satisfaction of publication or performance for both local and national audiences.

The ability to write well remains a rare but prized skill in almost every domain of our world, and English majors go on to careers in many fields of endeavor. The analytic talents and the writing and speaking skills honed in the major can lead graduates to careers in fields such as advocacy, publishing, teaching, the arts, law, venture capital, medicine, and policy making.

**Introductory courses** Courses numbered from 114 to 130 are introductory. Students planning to elect an introductory course in English should refer to the departmental Web site (<http://english.yale.edu/undergraduate-program/pre-registration>) for information about preregistration. To retain their place in an introductory English section, students must attend the first and all subsequent class meetings for the section until the end of the second week of classes. If a student misses a class meeting during this period without informing the instructor beforehand, his or her place will immediately be filled from the waiting list. Students may change their section by attending the desired section. If there are no available seats, the student may be placed on the waiting list for that section.

**Advanced courses** Courses numbered 150 and above are open to upperclassmen; the faculty recommends that students both within and outside the major prepare for such work with two terms of introductory English. Seminars are intended primarily for junior and senior English majors; sophomores and nonmajors may be admitted where openings are available.

When choosing courses, students should bear in mind that the English department's lecture courses and seminars play different roles in the curriculum. Lecture courses cover major periods, genres, and figures of English and American literature. They serve as general surveys of their subjects, and are typically offered every year or every other year. Seminars, by contrast, offer more specialized or intensive treatment of their topics, or engage topics not addressed in the lecture courses (for example, topics that span periods and genres). While seminars are often offered more than once, students should not expect the same seminars to be offered from one year to the next. Sophomores and juniors are encouraged to enroll in lecture courses in order to gain broad perspectives in preparation for more specialized study.

**Writing courses** Besides introductory courses that concentrate on the writing of expository prose (ENGL 114, 115, 120, and 121), the English department offers several creative writing courses. The introductory creative writing course, ENGL 123, is open to any student who has not taken an intermediate or advanced course in the writing of fiction, poetry, or drama. Interested students must preregister for ENGL 123, 134, and 135, but they need not submit a writing sample to gain admission as is required for all other creative writing courses. More advanced creative writing courses, designated "Creative Writing" in the course listings, are open to all students on the basis of the instructor's judgment of their work. Instructions for the submission of writing samples for admission to creative writing seminars and workshops are available at the departmental office in 107 LC and on the English department Web site (<http://english.yale.edu/undergraduate-program/course-applications-deadlines>); writing samples are received on line as directed on the Web site. Applicants receive e-mail notification of acceptance into writing courses. Students with questions about admission should visit the office of the director of undergraduate studies in 107 LC.

Students may in some cases arrange a tutorial in writing (ENGL 470), normally after having taken intermediate and advanced writing courses. All students interested in creative writing courses should also consult the current listing of residential college seminars (<http://yalecollege.yale.edu/academics/special-academic-programs/residential-college-seminar-program>).

**Prerequisites** It is valuable for students majoring in English to have both a detailed understanding of major poets who have written in English and some acquaintance with the classics of European and American literature. The prerequisites for the major are ENGL 125 and 126, the program's foundational courses in English poetry. Prospective English majors are strongly encouraged to complete the prerequisites, as well as one or more introductory literature courses such as ENGL 127, 129, or 130, by the end of the sophomore year. Those who have not enrolled in the Directed Studies program should consider taking both ENGL 129 and 130, the foundational courses in the European literary tradition.

A student who takes both ENGL 125 and 126 may count any three terms of ENGL 114, 115, 120, 121, 123, 127, 129, 130, or DRST 001, 002 toward the remaining twelve courses required for the major. If ENGL 125 and 126 are not taken, two terms of ENGL 114, 115, 123, 127, 129, 130, or DRST 001, 002 may count as the prerequisites so long as the student also takes, as part of the major, four advanced courses that deal substantially and intensively with poets included in ENGL 125 and 126. Two of these courses should substitute for two of the four units in ENGL 125 (Chaucer, Spenser, Shakespeare, and Donne), and two should substitute for two of the four units in ENGL 126 (Milton, Pope, Wordsworth, and Eliot or another modern anglophone poet). Courses that deal with more than one poet are acceptable for this purpose. Such courses may also count toward the requirement of three term courses in English literature before 1800 and one term course in English literature before 1900.

**The major** At least fourteen term courses are required for the major, including prerequisites and the senior requirement. No more than five courses numbered 130 or below may be counted toward the major. Each student, in consultation with a departmental faculty adviser, bears the responsibility for designing a coherent program, which must include the following elements.

Each student must take: (1) three term courses in literature written in English before 1800, one term course in literature written in English before 1900, and one term course in American literature, all representing a variety of periods and figures. Courses satisfying this requirement are indicated by the designations "Pre-1800 Lit," "Pre-1900 Lit," or "American Lit" in the course listings. Pre-1800 courses can, by definition, satisfy the pre-1900 requirement. Courses in American literature in the pre-1800 or pre-1900 periods may be counted toward both the relevant period requirement and the American requirement; (2) at least one seminar in both the junior and the senior years. The nature of senior seminars (400-level literature seminars) is discussed below.

Certain residential college seminars, with permission of the director of undergraduate studies, may be substituted for a departmental seminar; courses in creative writing may not.

A student whose program meets these requirements may count toward the major two upper-level literature courses in other departments, whether in English translation or in



another language; alternatively, the student may count one such literature course and, with the permission of an adviser, one other upper-level course in any subject that is relevant to the student's major in English. Such courses may not be counted toward the pre-1800 or the pre-1900 requirement. No more than two courses in creative writing may be counted toward the major; ENGL 123 does not count toward this limit. A student may petition the director of undergraduate studies for permission to include a third creative writing course.

**Senior requirement** Students must complete a two-course senior requirement consisting of one of the following combinations: (1) a senior seminar and a one-term senior essay; (2) two senior seminars; (3) a senior seminar or one-term senior essay, and a junior seminar in which the student, with the permission of the instructor, fulfills the senior requirement; (4) a two-term senior essay, with permission of the director of undergraduate studies; (5) a senior seminar or one-term senior essay, and the senior project in the writing concentration. Students who wish to complete the senior requirement by the end of the fall term of the senior year may begin it in the spring of the junior year.

**Senior seminar** Senior seminars are open to interested juniors as well, but one must be taken in the senior year to fulfill the senior requirement. These courses, usually numbered 400–449, are designated "Senior Seminar" in the course listings. The final essays written for senior seminars should provide an appropriate culmination to the student's work in the major and in Yale College. Such essays should rest on substantial independent work and should be approximately twenty double-spaced pages in length. In researching and writing the essay, the student should consult regularly with the seminar instructor, and may consult with other faculty members as well. Seniors, with the permission of the director of undergraduate studies and the instructor, may arrange to take a junior seminar for one term of the senior requirement. At the start of term the student must arrange with the instructor to do any additional work necessary to make the course an appropriate capstone experience.

**The senior essay** The senior essay is an independent literary-critical project on a topic of the student's own design, which is undertaken in regular consultation with a faculty adviser. It should ordinarily be written on a topic in an area on which the student has focused in previous studies. It may be written during one or two terms; single-term essays may be converted to yearlong essays through application to the director of undergraduate studies. See the course listings for ENGL 490 and 491 for procedures. Students fulfilling the senior requirement through a two-term senior essay or through a senior essay and the senior writing concentration project must take a seminar during their senior year, but it need not be a 400-level seminar.

Prospectuses and applications for senior essays are received in the office of the English major in 107 LC or on line as directed on the English department Web site (<http://english.yale.edu/undergraduate-program/senior-projects-essays>). They should be submitted during the designated sign-up period in the term before enrollment is intended.

**Credit/D/Fail courses** Courses taken Credit/D/Fail may be counted toward the requirements of the major.

**Advising** Students planning a program of study in English are strongly encouraged to consult the director of undergraduate studies, the departmental representative in their residential college, or their departmental adviser for advice about their course choices. A list of departmental representatives is available on the English Department Web site (<http://english.yale.edu/undergraduate-program/english-major>).

Schedules for all majors must be discussed with, and approved by, a faculty adviser from the English department, the director of undergraduate studies, or the associate director of undergraduate studies. Only then may they be submitted to the residential college dean's office. During the sixth term, each student completes a statement outlining progress in the major, in consultation with the student's adviser.

**Individual programs of study** In exceptional cases, a student whose interests and aims are well defined may, in consultation with the director of undergraduate studies, work out a program of study departing from the usual requirements of the major. Such a program must, however, meet the stated general criteria of range and coherence. For interdepartmental programs that include courses covering English literature, see the Literature Major (p. 476); Directed Studies (p. 222); American Studies (p. 105); African American Studies (p. 91); Ethnicity, Race, and Migration (p. 322); Theater Studies (p. 661); and Women's, Gender, and Sexuality Studies (p. 670).

**The writing concentration** The writing concentration is a special course of study open to students in the English major with demonstrated interest and achievement in writing. Admission is competitive. Interested English majors normally apply for admission to the concentration during the second term of their junior year. Application can also be made during the first term of the senior year. Every student admitted to the concentration must complete at least eleven literature courses as well as the other requirements of the major. Students admitted to the writing concentration may count up to four creative writing courses toward completion of the B.A. degree in English; the four courses must include at least two courses in one genre and at least one course in another genre; at least three must be at the 400 level. Only one of the four creative writing courses may be from ENGL 134, 135, 245, or 246; ENGL 120 and 123 do not count toward the writing concentration. Residential college seminars are not acceptable for credit toward the writing concentration, except by permission of the director of undergraduate studies. As one of the four writing courses, each student must complete ENGL 489, The Writing Concentration Senior Project, a tutorial in which students produce a single sustained piece of writing or a portfolio of shorter works. The writing concentration senior project may be offered in partial fulfillment of the senior requirement.

Applications for the writing concentration are received in the office of the English major in 107 LC or on line as directed on the departmental Web site (<http://english.yale.edu/undergraduate-program/course-applications-deadlines>). They should be submitted during the designated sign-up period in the term before enrollment is intended. Students are admitted selectively on the overall strength of their performance in the major and on the quality of their writing samples.

**Graduate school** Students considering graduate work in English should be aware that a reading knowledge of certain classical and modern European languages is ordinarily

required for admission to graduate study, and that a course orienting them to critical theory can be especially helpful preparation for graduate study.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** ENGL 125 and 126 or, with 4 addtl courses in major English poets, 2 terms selected from ENGL 114, 115, 123, 127, 129, 130, or DRST 001, 002

**Number of courses** at least 14 courses (incl prereq and senior req)

**Distribution of courses** 3 courses in lit in English before 1800, 1 course in lit in English before 1900, and 1 course in American lit, all representing a variety of periods and figures; 2 sems, 1 in junior, 1 in senior year; no more than 5 courses numbered ENGL 130 or below; no more than 2 creative writing courses; *Writing concentration*—same, except up to 4 creative writing courses, incl 2 in one genre and 1 in another genre, with at least 3 at 400 level; at least 11 lit courses

**Substitution permitted** college sem for departmental sem, with DUS permission; 2 upper-level lit courses in other depts or, with permission, 1 upper-level lit course and 1 addtl upper-level course in other depts for electives in the major; *Standard major*—a third writing course, with DUS permission

**Senior requirement** *Standard major*—1 senior sem and one-term senior essay (ENGL 490); or 2 sems in senior year, 1 of which is a senior sem, the other certified for senior req; or, with DUS permission, two-term senior essay (ENGL 490, 491); *Writing concentration*—senior sem or one-term senior essay, and writing concentration senior project (ENGL 489)

\* **ENGL 010b, Jane Austen** Stefanie Markovits

Close study of Austen's novels, with special attention to the critique of social and literary convention. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

English: Pre-1900 Lit

\* **ENGL 012a / AMST 016a / HUMS 052a, Literary Cities: New York, Chicago, San Francisco** Wai Chee Dimock

An introduction to American literature, told through the vibrant lives, ethnic diversities, and innovative genres revolving around three urban centers. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

English: American Lit

\* **ENGL 013b, Forms of Communication and Intimacy** Jill Campbell

New forms of electronic communication and their effects on social relationships and individuals' sense of self. Advantages and limitations of these forms in relation to means of communication and intimacy not dependent on electronic mediation. Correspondence by post, in-person conversation and nonverbal communication, social gatherings centered on food, erotic intimacy, group sociability, and silence. Analytical and creative writing assignments. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **ENGL 014a / AFAM 010a / AMST 018a, Twentieth-Century African American**

**Poetry** Elizabeth Alexander

African American poetry from Paul Laurence Dunbar to the present, with special attention to the contemporary Black poetry renaissance. Works explored in the contexts of locale, history, and literary and cultural movements. Research conducted

in the Beinecke Library's archives and in other archival collections at Yale. Includes attendance at poetry readings on campus, classroom visits by practicing poets in the contemporary canon, and a field trip to New York City. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU RP  
English: American Lit

\* **ENGL 016b, Technomodernism** Justin Neuman

The relationship between technology and Anglophone literature from 1893 to 1922. Focus on machines of war, communication, and transportation. Canonical modernists such as Eliot, Joyce, Stein, Kafka, Woolf, and Forster; artistic movements, including imagism, expressionism, futurism, cubism, and surrealism. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **ENGL 033b / AMST 346a, American Literature in the World** Wai Chee Dimock  
American literature as a gateway to the rest of the world. Key texts from the eighteenth century to the twenty-first, including works by Olaudah Equiano, Thomas Jefferson, Gertrude Stein, James Baldwin, Monique Truong, Ruth Ozeki, Jhumpa Lahiri, Barbara Kingsolver, Agha Shahid Ali, Cristina Garcia, Junot Diaz, and Dave Eggers. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

WR, HU  
English: American Lit

\* **ENGL 114a or b, Writing Seminars** Staff

Instruction in writing well-reasoned analyses and academic arguments, with emphasis on the importance of reading, research, and revision. Using examples of nonfiction prose from a variety of academic disciplines, individual sections focus on topics such as vision, globalization, generosity, experts and expertise, the good life, and dissent in American culture. WR

\* **ENGL 115a or b, Literature Seminars** Staff

Exploration of major themes in selected works of literature. Individual sections focus on topics such as war, justice, childhood, sex and gender, the supernatural, and the natural world. Emphasis on the development of writing skills and the analysis of fiction, poetry, drama, and nonfiction prose. WR, HU

\* **ENGL 120a or b, Reading and Writing the Modern Essay** Staff

Close study of selected works of nonfiction prepares students to become critical readers and to apply professionals' strategies to their own writing. Readings from such authors as Joan Didion, Malcolm Gladwell, Maxine Hong Kingston, N. Scott Momaday, George Orwell, Brent Staples, Jonathan Swift, Henry David Thoreau, Tom Wolfe, and Alice Walker. Written assignments, involving frequent revision, include autobiography, portraiture, nature writing, cultural critique, and formal argument. WR

\* **ENGL 121a or b, Styles of Academic and Professional Prose** Staff

A seminar and workshop in the conventions of good writing in a specific field. Each section focuses on one academic or professional kind of writing and explores its distinctive features through a variety of written and oral assignments, in which students both analyze and practice writing in the field. Section topics include legal, humor, travel, or nature writing; writing about medicine and public health, religion, the visual arts, or food; writing in the social sciences; writing reviews of the performing arts; and writing for radio. May be repeated for course credit in a section that treats a different genre or style of writing; may not be repeated for credit toward the major. WR

**\* ENGL 123a, Introduction to Creative Writing** Staff

Introduction to the writing of fiction, poetry, and drama. Development of the basic skills used to create imaginative literature. Fundamentals of craft and composition; the distinct but related techniques used in the three genres. Story, scene, and character in fiction; sound, line, image, and voice in poetry; monologue, dialogue, and action in drama. HU

**\* ENGL 125a or b, Major English Poets from Chaucer to Donne** Staff

An introduction to the diversity and the continuity of the English literary tradition through close reading of four poets from the fourteenth through the seventeenth centuries, Chaucer, Spenser, Shakespeare, and Donne. Emphasis on developing skills of literary interpretation and critical writing. WR, HU

**\* ENGL 126a or b, Major English Poets from Milton to T. S. Eliot** Staff

An introduction to the diversity and the continuity of the English literary tradition through close reading of four poets from the seventeenth through the twentieth centuries, Milton, Pope, Wordsworth, and Eliot or another modern anglophone poet. Emphasis on developing skills of literary interpretation and critical writing. WR, HU

**\* ENGL 127a or b, Readings in American Literature** Staff

Major works of the American literary tradition in a variety of poetic and narrative forms and in diverse historical contexts. Emphasis on analytical reading and critical writing. Authors may include Melville, Poe, Hawthorne, Bryant, Whitman, Dickinson, Thoreau, Emerson, Douglass, Stowe, Twain, Wharton, Cather, H. Crane, Stevens, Stein, L. Hughes, Paredes, Ellison, O'Connor, Ginsberg, Lowell, O'Hara, M. Robinson, C. McCarthy, Morrison, E. P. Jones, J. Díaz. WR, HU  
English: American Lit

**\* ENGL 129a / HUMS 198a / LITR 168a, Tragedy in the European Literary Tradition**  
Staff

The genre of tragedy from its origins in ancient Greece and Rome through the European Renaissance to the present day. Themes of justice, religion, free will, family, gender, race, and dramaturgy. Works include Homer's *Iliad* and plays by Aeschylus, Sophocles, Euripides, Seneca, Shakespeare, Racine, Ibsen, Chekhov, Brecht, Beckett, and Soyinka. Focus on textual analysis and on developing the craft of persuasive argument through writing. WR, HU

**\* ENGL 130a or b / HUMS 199a or b / LITR 169a or b, Epic in the European Literary Tradition** Staff

The epic tradition traced from its foundations in ancient Greece and Rome to the modern novel. The creation of cultural values and identities; exile and homecoming; the heroic in times of war and of peace; the role of the individual within society; memory and history; politics of gender, race, and religion. Works include Homer's *Odyssey*, Vergil's *Aeneid*, Dante's *Inferno*, Cervantes's *Don Quixote*, and Joyce's *Ulysses*. Focus on textual analysis and on developing the craft of persuasive argument through writing. WR, HU

**ENGL 132b, Science Fiction** Alfred Guy

A survey of twentieth- and twenty-first-century science fiction, focusing on how changing technologies produce new ideas about human identity. Emphasis on innovations in science and engineering as well as new forms of social, political, and

economic life. Works by Robert Heinlein, Philip K. Dick, Ursula Le Guin, and William Gibson. Not open to freshmen. WR, HU

English: American Lit

**\* ENGL 134a or b, Reading Fiction for Craft** Staff

Fundamentals of the craft of fiction writing explored through readings from classic and contemporary short stories and novels. Focus on how each author has used the fundamentals of craft. Writing exercises emphasize elements such as voice, structure, point of view, character, and tone. HU

English: Creative Writing

**\* ENGL 135a or b, Reading Poetry for Craft** Staff

An introduction to reading and writing poetry. Classic examples from Shakespeare and Milton, the modernist poetics of Stein, Pound, Moore, and Stevens, and recent work in a variety of forms and traditions. Students develop a portfolio of poems and write an essay on the poetic craft of poets who have influenced their work. HU

English: Creative Writing

**\* ENGL 155b / LING 183b, Readings in Old Norse Poetry and Prose: Chronicles of the Vikings** Roberta Frank

An introduction to the language and literature of earliest Norway and Iceland. Texts (to be read in the original) include runic inscriptions left behind by the Vikings, verse of their official skalds, the sometimes irreverent mythological poetry of the Edda, and the sagas telling of the Norse discovery of America. HU

English: Junior Seminar

English: Pre-1800 Lit

**\* ENGL 157a / FREN 305a / HUMS 159a, Medieval Biography** Ardis Butterfield

The sources, aims, and diversity of biographical forms in medieval literature. Analysis of the medieval world through the study of autobiography, hagiography, political martyrology, and literary biography; the challenges of viewing a historical period primarily through a single life. Includes a research trip to New York City. Recommended preparation: reading knowledge of French. HU TR

English: Junior Seminar

English: Pre-1800 Lit

**ENGL 171b / HUMS 160b / LITR 177b, Chaucer and Medieval London**

Ardis Butterfield

Chaucer's writings explored through the human and physical landscape of medieval London and Westminster. The crowds, sounds, and visual stimuli of the city examined alongside literary genres in which the author wrote, including dream visions, love epic, lyrics, and comic, satiric, and religious narrative. Chaucer's sense of the writer's craft as a means of imagining space and sound and of depicting the emotional resonance of urban street scenes. HU

English: Pre-1800 Lit

**\* ENGL 180b / LITR 187b, Literature of the Renaissance** Lawrence Manley

A study of Renaissance masterworks from 1340 to 1635. Focus on classical humanism and its contributions to literature, politics, religion, philosophy, and the arts. Overview of major literary and intellectual developments; key literary genres; the rhetorical mobility and intellectual versatility of Renaissance writers. Techniques of close and contextual reading. HU

English: Pre-1800 Lit  
 English: Junior Seminar

**ENGL 185a / FILM 356a / HUMS 161a, Medieval Literature in Movies**

Alastair Minnis

A study of medieval narrative traditions and their appropriation in modern film. *Beowulf*, selections from Chaucer's *Canterbury Tales*, and Malory's *Morte D'Arthur* are compared with modern film and television adaptations. HU

English: Pre-1800 Lit

**ENGL 194b / AFAM 194b / AMST 194b, African American Arts Today**

Elizabeth Alexander

The renaissance in African American culture from 1980 to the present. Great works of poetry, fiction, creative nonfiction, drama, film, music, dance, painting, photography, and hip-hop by living African American artists. Critical vocabularies and approaches with which to think about questions of genre; writing knowledgeably and persuasively about art across multiple genres and in historical context. Artists include Anna Deavere Smith, Suzan-Lori Parks, Toni Morrison, Edwidge Danticat, Colson Whitehead, Hilton Als, Rita Dove, Terrance Hayes, Bill T. Jones, Kerry James Marshall, Lorna Simpson, Jason Moran, and Jay-Z. Lectures feature public conversations with several of the artists studied. HU

English: American Lit

\* **ENGL 197a / HIST 217Ja, The Book in Early Modern Britain** Kathryn James

The influence of the book in Britain from 1475 to 1660, including both manuscript and print formats. The book as material, cultural, and political object; its role in religious, political, and social transformations of the period. Focus on objects from Yale's British history and art collections. WR, HU

English: Junior Seminar

English: Pre-1800 Lit

**ENGL 200b, Shakespeare: Comedies and Romances** Catherine Nicholson

Love, sex, gender, society, and theater practice in Shakespeare's comic genres, from the early farces and romantic comedies to the problem plays and late romances. WR, HU

English: Pre-1800 Lit

**ENGL 201a, Shakespeare: Histories and Tragedies** Brian Walsh

A study of Shakespeare's histories and tragedies, focusing on attentive reading of the play texts and consideration of the theatrical, literary, intellectual, political, and social worlds in which the plays were written, performed, and experienced. HU

English: Pre-1800 Lit

\* **ENGL 208b, Shakespeare: The Major Tragedies** David Kastan

Examination of *Hamlet*, *Othello*, *Macbeth*, and *King Lear* and of the qualities that have determined their distinction among Shakespeare's works. Analysis of each play as a script for performance, a literary text, and a printed object. The inventiveness of Shakespeare's literary imagination; the institutional conditions in which his works were created, played, and experienced. Prerequisite: ENGL 201. WR, HU

English: Pre-1800 Lit

English: Junior Seminar

**ENGL 213b / HUMS 171b, Style, Purpose, and Persuasion in Literature**

David Bromwich

The uses of rhetoric, persuasion, and the making of infectious moods and emotions in literature, political writing, and social criticism. Topics include incitement, description with intent, and epigram and aphorism. Examples are drawn from Shakespeare, Milton, Emerson, Burke, Lincoln, Churchill, Auden, Kipling, Gershwin, and others.

HU

**\* ENGL 216a, Minor English Poets, 1500–1800** Catherine Nicholson

Poets who fall outside the mainstream of major English poetry, either by circumstance or by choice, and their role in the evolution of the English poetic tradition. Focus on poetry written between 1500 and 1800, when the idea and contours of a vernacular canon first took shape. The historically contingent character of qualities such as genius, beauty, and good taste. WR, HU

English: Junior Seminar

English: Pre-1800 Lit

**\* ENGL 218b, Seventeenth-Century English Literature** John Rogers

A survey of seventeenth-century poetry and prose, exclusive of Milton. Authors include poets Donne, Herbert, Crashaw, and Rochester; playwrights Webster and Ford; philosophers Bacon, Hobbes, and Locke; essayists Burton and Browne; and fiction writers Cavendish, Bunyan, and Behn. WR, HU

English: Pre-1800 Lit

English: Junior Seminar

**ENGL 220a, Milton** John Rogers

A study of John Milton's poetry, his engagement with the cultural, social, and political struggles of the English Revolution, and his decisive influence on the course of English literature. WR, HU

English: Pre-1800 Lit

**\* ENGL 236b / AMST 330b, Dystopic and Utopian Fictions** James Berger

Attempts since the late nineteenth century to imagine, in literature, cinema, and social theory, a world different from the existing world. The merging of political critique with desire and anxiety; the nature and effects of social power; forms of authority, submission, and resistance. HU

English: Junior Seminar

English: American Lit

**\* ENGL 240a / HIST 199Ja, Writing Narrative History** Edward Ball

Introduction to writing narrative nonfiction, including history, biography, and narrative journalism. The craft of turning real events, past or present, into plot- and character-driven stories. Reading of model texts, with attention to their use of character, making of scenes, point of view, structure, and dramatic moves. Students research, write, and revise their own nonfiction texts. Prerequisite: a 200-level English course or a History course. WR, HU, SO

English: Creative Writing

**\* ENGL 242b, Consciousness and Form in Eighteenth-Century England**

Jill Campbell

The conceptualization of consciousness in England from the late-seventeenth through the eighteenth century. Philosophical writings that made "consciousness" a key term in



defining personal identity, memory, and culpability; literary forms that variously depict individual and collective consciousness. Texts range from philosophical essays to novels, plays, poetry, and personal letters. HU

English: Pre-1800 Lit

English: Junior Seminar

\* **ENGL 243a / HUMS 428a / LITR 207a / MGRK 214a / WGSS 215a, Modern Literature and the Eastern Mediterranean** Langdon Hammer

The formative influences of Sappho and C. P. Cavafy on the Anglo-American literary tradition from the twentieth century to the present. Nationalism and imperialism, sexuality and aesthetics, biography and art, sapphic verse, the reception of the classical tradition, and the topography of modernity. Writers' fascination with the eastern Mediterranean as an alternative locus for modern Greek, English, and American identities. HU

\* **ENGL 244b, Writing for Radio** Allyson McCabe

Introduction to the essential elements of audio storytelling, with a focus on genre, structure, and process. Vox pops and audio postcards, personal narratives and profiles, and news features and commentaries. Students produce a short piece in public-radio style to contribute to the Public Radio Exchange. WR

English: Creative Writing

\* **ENGL 245a, Introduction to Writing Fiction** Staff

An intensive introduction to the craft of fiction, designed for aspiring creative writers. Focus on the fundamentals of narrative technique and peer review. Prerequisite: a previous course in English or in another literature.

English: Creative Writing

\* **ENGL 246a or b, Introduction to Verse Writing** Staff

A seminar workshop for students who are beginning to write poetry or who have no prior workshop experience at Yale. Preference given to freshmen and sophomores. RP

English: Creative Writing

\* **ENGL 247a, Writing about Contemporary Figurative Art** Margaret Spillane

A workshop on journalistic strategies for looking at and writing about contemporary paintings of the human figure. Practitioners and theorists of figurative painting; controversies, partisans, and opponents. Includes field trips to museums and galleries in New York City. WR, HU

English: Creative Writing

\* **ENGL 248a / EVST 325a / HUMS 166a, Nature Writing in Britain and the English-Speaking World** Linda Peterson

Natural history and environmental writing in the English-speaking world from the late eighteenth century to the present. Readings include Gilbert White's *Natural History of Selborne*, Thoreau's *Walden*, and Darwin's *Voyage of the Beagle*, as well as recent work by writers from Canada, the United States, India, and South Africa. Pre-1900 with permission of instructor. WR, HU

English: Junior Seminar

**ENGL 250a, Romantic Poetry** Paul Fry

Major works of Wordsworth, Coleridge, Byron, P. B. Shelley, and Keats, as well as selections from the works of Blake and from Mary Shelley's *Frankenstein*. HU

English: Pre-1900 Lit

**\* ENGL 260b, Victorian Poetry** Linda Peterson

Exploration of poetry written between 1830 and 1900, using the thematic rubrics of love, death, and nature. Genres traditionally associated with these themes, including the love sonnet, the elegy, and the loco-descriptive poem; genres newly invented by Victorian poets, such as the dramatic monologue and romance. Poets include Alfred Tennyson, Robert Browning, Elizabeth Barrett Browning, Christina Rossetti, George Meredith, Oscar Wilde, and other pre-Raphaelites. WR, HU

English: Junior Seminar

English: Pre-1900 Lit

**\* ENGL 262a, Nineteenth-Century Historical Narratives** Stefanie Markovits

British historical narratives in the nineteenth century, an age often cited as the crucible of modern historical consciousness. How a period of industrialization and democratization grounded itself in imagined pasts – whether recent or distant, domestic or foreign – in both historical novels and works by historians who presented programmatic statements about the nature of historical development. WR, HU

English: Junior Seminar

English: Pre-1900 Lit

**ENGL 280a or b / AMST 210a or b, Early American Literature to 1865** Greta LaFleur

Introduction to major genres, movements, historical periods, and themes in American literature from the seventeenth century to 1865. Early American cultural, sociopolitical, religious, colonial, and literary history; literary forms such as novels, poetry, essays, sermons, autobiography, and short stories. Authors include Douglass, Melville, Dickinson, Apess, Poe, Whitman, Paine, and Brockden Brown. HU

English: American Lit

English: Pre-1900 Lit

**ENGL 283b, Poetry since 1950** Langdon Hammer

Poets and poetic movements from the second half of the twentieth century in the United States, England, Ireland, and the Caribbean. Authors include Bishop, Lowell, O'Hara, Ginsberg, Plath, Ashbery, Merrill, Larkin, Gunn, Hill, Heaney, Muldoon, and Walcott. WR, HU

**\* ENGL 285b, The Nonhuman in Literature since 1800** Wai Chee Dimock

Animate and inanimate life forms in fiction and poetry from the nineteenth century to the twenty-first. Viruses and insects, plants and animals, intelligent machines, and extraterrestrial aliens. The complexity and variety of nonhuman ecology. WR, HU

English: American Lit

English: Junior Seminar

**ENGL 291b / AMST 261b, The American Novel since 1945** Amy Hungerford

American fiction; works by Richard Wright, Flannery O'Connor, Jack Kerouac, Vladimir Nabokov, Philip Roth, Thomas Pynchon, John Barth, Maxine Hong Kingston, Toni Morrison, Cormac McCarthy, Lev Grossman, Alison Bechdel, and Junot Diaz. HU

English: American Lit

**ENGL 293b / AFAM 140b / AMST 211b / ER&M 210b / WGSS 211b, Race and Gender in American Literature** Birgit Rasmussen

The role of literature in constructing representations of America as an idea, a nation, a colonial settlement, and a participant in world affairs. What kind of place America is and who belongs there; the consequences of America's history for its national literature. Emphasis on the ways texts represent and contest social concepts of race and gender difference. WR, HU

English: American Lit

**ENGL 300b / LITR 300b, Introduction to Theory of Literature** Carol Jacobs

An examination of concepts and assumptions in contemporary views of literature. Theories of meaning, interpretation, and representation. Critical analysis of formalist, psychoanalytic, structuralist, poststructuralist, Marxist, and feminist approaches to theory and to literature. HU

**\* ENGL 301a, The Modern British Novel** Staff

A survey of major British novels, and of British modernism more generally, from 1900 to 1945. Ways in which the novels envision contemporaneous revolutionary currents and uprisings in Russia, Mexico, India, and Ireland. Emphasis on perspectives endemic to modernist studies, including colonialism, feminism, primitivism, nihilism, anarchism, socialism, and impressionism. WR, HU

English: Junior Seminar

**\* ENGL 303a / HUMS 170a, Consciousness in the Novel from Austen to Woolf**

Ruth Yeazell

Close study of selected novels by Jane Austen, George Eliot, Henry James, and Virginia Woolf, with particular attention to the representation of consciousness and the development of free indirect discourse, as well as recent speculations about so-called theory of mind. Readings supplemented by narrative theory. Pre-1900 with permission of instructor. WR, HU

English: Junior Seminar

**\* ENGL 331b / WGSS 353b, Modernism, Gender, and Sexuality in the Literature of World War I** Margaret Homans

Fiction, poetry, journalism, and memoirs by U.S. and British writers from World War I and its aftermath, with special attention to the war's effects on gender, on sexuality, and on literary modernism. Topics include trauma, shell shock, memory and memorial art, violence and subjectivity, the relation of the front lines to the home front, and representations of the injured body. WR, HU

English: Junior Seminar

**\* ENGL 332a / AFAM 302a, Music and African American Literature** Anthony Reed

Reading of canonical and recent African American literature to trace connections between music and writing. Uses of music, sound, and sound engineering in black literary culture from jazz and blues poetry to hip-hop. No knowledge of music required.

WR, HU

English: American Lit

English: Junior Seminar

**\* ENGL 334b / LITR 415b, James Joyce and Marcel Proust** Marta Figlerowicz

Close reading of James Joyce's *Ulysses* and selections from Marcel Proust's *In Search of Lost Time*. The novels' modernist context, including questions about subjectivity,

attention and distraction, consciousness and the unconscious, and aesthetic form. Issues raised by contemporaneous works in psychoanalysis, psychology, and aesthetic criticism, as well as by recent accounts of modernism. HU

English: Junior Seminar

\* **ENGL 335a / AFAM 338a / LITR 280a, Caribbean Poetry** Anthony Reed  
Survey of major twentieth-century Caribbean poets such as Derek Walcott, Kamau Brathwaite, and Aimé Césaire. WR, HU

English: Junior Seminar

\* **ENGL 336a / LITR 323a / THST 303a, The Opera Libretto** J. D. McClatchy  
A selective survey of the genre from its seventeenth-century Italian origins to the present day. The libretto's history, from *opera seria* to *opéra comique* to melodrama, featuring libretti by Hofmannsthal, W. S. Gilbert, and Auden. Emphasis on literary adaptations, from Da Ponte and Beaumarchais to Britten and Thomas Mann. Source material includes works by Shakespeare, Schiller, Hugo, Melville, and Tennessee Williams. Readings in English; musical background not required. WR, HU

English: Junior Seminar

\* **ENGL 340a / AFST 408a / LING 121a, English as a World Language** Staff  
The spread of the English language around the world and the pluralization of English into many varieties. Key topics, major concepts, theoretical issues, and current debates in the field of world Englishes. Historical and sociopolitical factors that account for the global spread of English; linguistic implications of that spread; models and frameworks for describing different varieties of English; linguistic and structural features of selected varieties. HU

English: Junior Seminar

**ENGL 344a / EP&E 265a / ER&M 236a, Global Fictions** Justin Neuman  
Narrative literature from the late nineteenth century to the present that explores and reflects the dialectics of globalization. Vectors of globalization examined include energy systems, commodity capitalism, war, and sexuality. Works by Verne, Kafka, Forster, Duras, Bolaño, and others. WR, HU

\* **ENGL 353a / HUMS 295a / LITR 463a, Medieval Celtic Literature** David Gabriel  
Major texts of Celtic literature, focusing on works from the birth of vernacular literature in the Middle Ages to the early modern period. Cultural, historical, and literary issues surrounding works in the Irish and Welsh languages; literary culture in Breton, Cornish, Scottish Gaelic, and Manx. Genres include lyric and bardic poetry, heroic and religious narrative, and early Arthurian works. Readings in English translation; no knowledge of Celtic languages assumed. HU TR

English: Pre-1800 Lit

English: Junior Seminar

\* **ENGL 354a / AMST 235a, Language, Disability, Fiction** James Berger  
Portrayals of cognitive and linguistic impairment in modern fiction. Characters with limited capacities for language as figures of "otherness." Contemporaneous discourses of science, sociology, ethics, politics, and aesthetics. The ethics of speaking about or for subjects at the margins of discourse. HU

English: Junior Seminar

English: American Lit

\* **ENGL 357a / LITR 426a / WGSS 340a, Feminist and Queer Theory**

Moira Fradinger

Historical survey of feminist and queer theory from the Enlightenment to the present, with readings from key British, French, and American works. Focus on the foundations and development of contemporary theory. Shared intellectual origins and concepts, as well as divergences and conflicts, among different ways of approaching gender and sexuality. WR, HU

English: Junior Seminar

\* **ENGL 358b, Literature for Young People** Michele Stepto

An eclectic approach to stories and storytelling for and by children. Authors include Nathaniel Hawthorne, Louisa May Alcott, J. K. Rowling, Leo Lionni, Laurent de Brunhoff, Dr. Seuss, Maurice Sendak, and children themselves. HU RP

English: Junior Seminar

\* **ENGL 361b / THST 329b, Theater Now** Marc Robinson

Study of the drama, performance, and dance theater created in the last ten years, with special attention to work produced in 2014–2015. Readings from both published and unpublished American and British plays, contemporary criticism and theory, interviews, and essays by the artists themselves. Video of works created by companies such as Elevator Repair Service and the Nature Theater of Oklahoma. May include attendance of productions at performance spaces in and around New York City. HU

\* **ENGL 370a, Law and Literature** Caleb Smith

Law and literature as genres of discourse and institutions of authority, with a focus on the United States in the nineteenth and twentieth centuries. Sources of legitimacy, conditions of legal crisis, and justifications for punishment. Readings from legal treatises, judicial opinions, and literary works by Aeschylus, Shakespeare, Jacobs, Melville, Baca, and others. WR, HU

English: American Lit

English: Junior Seminar

\* **ENGL 375b, Poetic Form** Benjamin Glaser

Survey of English-language poetics from Middle English to the present, including both historical theories of poetic form and the form itself in practice. Focus on poetry, with some attention to music with lyrics. Reading and listening for lyrical style; linguistic and sociological work on style in its relation to class, race, and gender. HU

English: Junior Seminar

\* **ENGL 384b / FILM 461b / THST 416b, British Cinema** Katie Trumpener

Survey of the British film tradition, emphasizing overlap with literature, drama, and art; visual modernism; documentary's role in defining national identity; "heritage" filmmaking and alternative approaches to tradition; and auteur and actors' cinema.

HU RP

English: Junior Seminar

\* **ENGL 385b / WGSS 339b, Fiction and Sexual Politics** Margaret Homans

Historical survey of works of fiction that have shaped and responded to feminist, queer, and transgender thought from the late eighteenth century to the present. Authors include Wollstonecraft, C. Bronte, H. Jacobs, C. P. Gilman, R. Hall, Woolf, Wittig, Walker, Anzaldua, Morrison, Kingston, Winterson, and Bechdel. WR, HU

English: Junior Seminar

\* **ENGL 388b / THST 290b, Poetics of Performance** Justin Sider

Introduction to the oral interpretation of poetry. The expressive principles of social communication and cultural practice as implemented by performance. Experiences of empathy, pathos, and mood; techniques of embodying, projecting, and breathing; modes of analysis, figuration, and interpretation. HU

\* **ENGL 390a / HUMS 169a / THST 411a, Art and the Stage in Britain** Joseph Roach

The intersection of the fine and performing arts in London and in the British provinces and colonies, from the stage designs of Inigo Jones in the seventeenth century to those of David Hockney in the twentieth and twenty-first. Survey of major styles in stage design, theatrical portraiture, theater architecture, and ephemera. Extensive use of collections in the Yale Center for British Art. WR, HU

English: Junior Seminar

\* **ENGL 395a / HUMS 165a / LITR 154a, The Bible as Literature** Leslie Brisman

Study of the Bible as a literature—a collection of works exhibiting a variety of attitudes toward the conflicting claims of tradition and originality, historicity and literariness. Pre-1800 with completion of supplementary assignments in the language of the King James Bible. If there is sufficient interest, a second section will be offered. WR, HU RP

English: Junior Seminar

\* **ENGL 400a, Theory of Lyric** Benjamin Glaser

Theories about lyric poetry from Plato to the present. Focus on critical movements of the twentieth and twenty-first centuries, including new criticism, structuralism, the Frankfurt school, poststructuralism, cultural studies, and historical poetics. Lyric as an idea that intersects dynamically with a range of historical and cultural poetic practices.

HU

English: Senior Seminar

\* **ENGL 402a, Alliterative Poetry in Middle English** Ian Cornelius

A study of late medieval English poetry in alliterative verse: Arthurian romance, biblical narrative, saints' lives, and allegorical dream-visions. Readings include *Sir Gawain and the Green Knight*, *Patience*, *Pearl*, *St. Erkenwald*, and portions of *Piers Plowman*. WR, HU

English: Senior Seminar

English: Pre-1800 Lit

\* **ENGL 403b, Medieval Manuscripts** Jessica Brantley

A history of the medieval book and its social uses, based on materials at the Beinecke Library. Topics include the roles of authors, scribes, artists, and readers in constructing, writing, illuminating, and editing manuscripts. WR, HU

English: Senior Seminar

English: Pre-1800 Lit

\* **ENGL 414a / HUMS 453a, Utopia** John Rogers

An examination of utopian fiction. Focus on works from early modern England, with some attention to more recent utopian writings. The genre's Platonic origins, its ties to early modern political philosophy, its role in the rise of the novel, and its legacy in science fiction. Utopian literature's abiding concern with issues of social discipline, religion, education, science, marriage, and sex. WR, HU

English: American Lit

English: Senior Seminar

\* **ENGL 415a, Milton's Paradise Lost** David Kastan

Close study of *Paradise Lost*, focusing on the literary, political, and theological pressures that affected Milton's writing and that continue to affect his reputation.

Prerequisite: ENGL 220. WR, HU

English: Pre-1800 Lit

English: Senior Seminar

\* **ENGL 416a, Contemporary British Fiction** Caryl Phillips

A study of literature that responds to a changing post-World War II Britain, with attention to the problem of who "belongs" and who is an "outsider." Authors include Alan Hollinghurst, Kazuo Ishiguro, Colin McInnes, Samuel Selvon, Ruth Praver Jhabvala, and John Osborne. WR, HU RP

English: Senior Seminar

\* **ENGL 419a / AMST 366a / THST 355a, Modernism and American Theater**

Marc Robinson

Examination of modernist principles as they are adapted to, and tested in, American theater. Playwrights include Eugene O'Neill, Gertrude Stein, e. e. cummings, Djuna Barnes, Mae West, Thornton Wilder, Tennessee Williams, Jane Bowles, and Frank O'Hara.

English: American Lit

English: Senior Seminar

\* **ENGL 438a and ENGL 439b / THST 473a and THST 474b, Directed Independent Study: Eugene O'Neill** Staff

Individual or small-group study focused on the works of Eugene O'Neill. The course of study is planned by the student under faculty supervision; work may include one or more performances and/or written projects. Open to junior and senior Theater Studies majors, and to nonmajors with permission of the instructor.

\* **ENGL 443a / AFAM 408a / AMST 460a, African American Poets of the Modern Era**

Robert Stepto

The African American practice of poetry between 1900 and 1960, especially of sonnets, ballads, sermonic, and blues poems. Poets include Paul Laurence Dunbar, Langston Hughes, Sterling Brown, Gwendolyn Brooks, Margaret Walker, and Robert Hayden. Class sessions at the Beinecke Library for inspection and discussion of original editions, manuscripts, letters, and other archival material. HU

English: American Lit

English: Senior Seminar

\* **ENGL 444a / AMST 466a, Contemporary Historical Novels** James Berger

Attempts of contemporary American authors to put the complexities of history into written form. Narrative as the privileged mode of historical representation; differences between what is regarded as academic history, popular history, and historical fiction; the influence of power and of the writer's own historical position on historical narrative; effects of ethnicity, gender, and race on the creation and reception of history; writers' use of historical fiction to change the ways readers think about the present and the future. HU

English: Senior Seminar

English: American Lit

\* **ENGL 446a / WGSS 426a, Virginia Woolf** Margaret Homans

A study of the major novels and other writings by Virginia Woolf, with additional readings in historical contexts and in Woolf biography and criticism. Focus on Woolf's modernist formal experimentation and on her responses and contributions to political movements of her day, principally feminism and pacifism; attention also to the critical reception of her work, with emphasis on feminist and queer literary criticism and theory. WR, HU

English: Senior Seminar

\* **ENGL 450b, Daily Themes** Richard Deming

Writing of prose at the intermediate level. Daily assignments of c. 300 words, a weekly lecture, and a weekly tutorial. Application forms available on the Web by mid-November. Not open to freshmen. Counts as a nonfiction course in the writing concentration. WR

English: Creative Writing

\* **ENGL 453a / THST 320a, Playwriting** Donald Margulies

A seminar and workshop in writing for the stage. Readings include modern American and British plays by Pinter, Mamet, Churchill, Kushner, Williams, and Wilder.

Emphasis on play structure, character, and conflict. In addition to weekly exercises, students write a one-act play. RP

English: Creative Writing

\* **ENGL 454a, Nonfiction Writing: Voice and Structure** Fred Strebeigh

A nonfiction workshop, confronting the challenges of journalism as an art. Emphasis on voice and structure. Study of texts that may suggest modes, voices, forms, and styles for nonfiction pieces. Frequent writing projects and revisions. WR RP

English: Creative Writing

\* **ENGL 455b, Writing about Oneself** Anne Fadiman

A seminar and workshop in first-person writing. Students explore a series of themes (e.g., family, love, loss, identity) both by writing about their own lives and by reading British and American memoirs, autobiographies, personal essays, and letters. An older work, usually from the nineteenth or early twentieth century, is paired each week with a more recent one on the same theme. WR

English: Creative Writing

\* **ENGL 456b / HUMS 427b / JDST 316b / LITR 348b, The Practice of Literary Translation** Peter Cole

Intensive readings in the history and theory of translation paired with practice in translating. Case studies from ancient languages (the Bible, Greek and Latin classics), medieval languages (classical Arabic literature), and modern languages (poetic texts).

HU

\* **ENGL 459a / EVST 215a, Scientific and Environmental Writing** Carl Zimmer

An intensive workshop in writing about science and the environment for a broad audience. Translating complex subjects into elegant prose, conducting interviews, handling controversies, researching articles, and finding one's voice. Readings include exemplary works ranging from newspaper articles to book excerpts. WR RP

English: Creative Writing



\* **ENGL 460a or b, Advanced Poetry Writing** Staff

A seminar and workshop in the writing of verse. May be repeated for credit with a different instructor. RP

English: Creative Writing

\* **ENGL 465a or b, Advanced Fiction Writing** Staff

An advanced workshop in the craft of writing fiction. May be repeated for credit with a different instructor.

English: Creative Writing

\* **ENGL 466b, Writing the Contemporary Essay** Cynthia Zarin

A seminar and workshop in the contemporary essay. Public versus private voice, the responsibilities of the essayist, and the evolution of writing in the first person. Readings include essays by Joan Didion, Jonathan Lethem, Jenny Diski, Zadie Smith, M. F. K. Fisher, Bruce Chatwin, John Berger, and Oliver Sacks.

English: Creative Writing

\* **ENGL 467a / PLSC 253a, Journalism** Steven Brill

An intensive workshop in the journalism profession and its changing role and accelerating challenges. Definitions of journalism; the role of journalism in a democracy and a free market; differences between information, news, vicarious news, and entertainment; knowing and telling a good story; the structure of newspaper articles, blogs, online newspapers and magazines, mixed digital media, magazine features, television reports, and nonfiction books; interviewing techniques; fairness; sourcing; the economics of journalism; and audience. Fulfills the core seminar requirement for Yale Journalism Scholars. No prerequisites. WR

English: Creative Writing

\* **ENGL 468b / THST 327b, Advanced Playwriting Workshop** Donald Margulies

An intensive workshop in advanced playwriting techniques. Discussion of works by contemporary playwrights. In addition to weekly exercises, students write a full-length play. Prerequisite: an intermediate course in playwriting or screenwriting, or with permission of the instructor. RP

English: Creative Writing

\* **ENGL 469a, Advanced Nonfiction Writing** Anne Fadiman

A seminar and workshop with the theme "At Home in America." Students consider the varied ways in which modern American literary journalists write about place, and address the theme themselves in both reportorial and first-person work. No prerequisites. WR, HU

English: Creative Writing

\* **ENGL 470a or b, Tutorial in Writing** Jessica Brantley

A writing tutorial in fiction, poetry, playwriting, screenwriting, or nonfiction for students who have already taken writing courses at the intermediate and advanced levels. Conducted with a faculty member after approval by the director of undergraduate studies. Prerequisites: two courses in writing.

English: Creative Writing

\* **ENGL 474a, The Genre of the Sentence** Verlyn Klinkenborg

A workshop that explores the sentence as the basic unit of writing and the smallest unit of perception. The importance of the sentence itself versus that of form or genre.

Writing as an act of discovery. Includes weekly writing assignments. Not open to freshmen. HU

English: Creative Writing

\* **ENGL 476a, Contemporary Poetry and Poetics** Richard Deming

A study of contemporary poetry and poetics that explores both literary criticism and creative writing. Ways to assess prevailing poetic values and articulate one's own. Attention to critical skills for engaging recent developments in the field; development of a sense of the current aesthetic landscape. Includes four additional class meetings with influential contemporary poets who represent a variety of styles and modes. WR

English: Creative Writing

\* **ENGL 477a, Reading and Writing About Artificial Intelligence** Paul Grimstad

Representations of artificial intelligence in science fiction, philosophy, and popular culture. Analysis of texts and theory complemented with creative writing. HU

\* **ENGL 478a, Writing about Place** Cynthia Zarin

An exploration of reading and writing about place. Definitions of home; different meanings and intent of travel. Readings include exemplary contemporary essays from the eighteenth century to the present. Workshop for assigned student essays. WR, HU

\* **ENGL 482a, Jane Austen and the Eighteenth-Century Tradition** Jill Campbell

Study of Jane Austen's fiction in relation to novels by her eighteenth-century predecessors, with additional short readings in poetry, philosophy, and political debate of the period. The range of novelistic forms and genres that emerged in the eighteenth century; new ways of depicting interior experience through fictional modes; the codification of gender and sexuality in the courtship plot. WR, HU

English: Senior Seminar

English: Pre-1900 Lit

\* **ENGL 488a or b, Special Projects for Juniors or Seniors** Staff

Special projects set up by the student in an area of particular interest with the help of a faculty adviser and the director of undergraduate studies, intended to enable the student to cover material not otherwise offered by the department. The course may be used for research or for directed reading, but in either case a term paper or its equivalent is normally required. The student meets regularly with the faculty adviser. To apply for admission, a student must submit an application and prospectus signed by the faculty adviser to the office of the director of undergraduate studies. Students must apply by December 5, 2014, for spring-term projects and by April 24, 2015, for fall-term projects. Application details and forms are available at [english.yale.edu/undergraduate-program](http://english.yale.edu/undergraduate-program).

\* **ENGL 489a or b, The Writing Concentration Senior Project** Staff

A term-long project in writing, under tutorial supervision, aimed at producing a single longer work (or a collection of related shorter works). An application and prospectus signed by the student's adviser must be submitted to the office of the director of undergraduate studies by December 5, 2014, for spring-term projects and by April 24, 2015, for fall-term projects. The project is due by the end of the last week of classes (fall term), or the end of the next-to-last week of classes (spring term). Application details and forms are available at [english.yale.edu/undergraduate-program](http://english.yale.edu/undergraduate-program).

\* **ENGL 490a or b, The Senior Essay I** Jessica Brantley

Students wishing to undertake an independent senior essay in English must apply through the office of the director of undergraduate studies. Applications are due by December 5, 2014, for spring-term essays or for yearlong essays beginning in the spring term; applications are due by April 24, 2015, for fall-term essays or for yearlong essays beginning in the fall term. Application details and forms are available at [english.yale.edu/undergraduate-program](http://english.yale.edu/undergraduate-program). For one-term senior essays, the essay itself is due in the office of the director of undergraduate studies according to the following schedule: (1) end of the fourth week of classes: five to ten pages of writing and/or an annotated bibliography; (2) end of the ninth week of classes: a rough draft of the complete essay; (3) end of the last week of classes (fall term) or end of the next-to-last week of classes (spring term): the completed essay. Consult the director of undergraduate studies regarding the schedule for submission of the yearlong senior essay.

\* **ENGL 491a or b, The Senior Essay II** Staff

Second term of the optional yearlong senior essay. Students may begin the yearlong essay in the spring term of the junior year, allowing for significant summer research, with permission of the instructor. After ENGL 490.

**OTHER COURSES RELATED TO ENGLISH LANGUAGE AND LITERATURE**

\* **HUMS 077a / AMST 017a / ER&M 017a, Travel Literature of the Americas**

Dixa Ramirez

Evolving visions of the so-called New World from 1492 to the present. Readings from fictional and nonfictional accounts of travel to or throughout the Americas. Visual examples of travel narratives, including tourism ads; some attention to scholarly criticism. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

## Environment

At Yale, the environment is studied from a variety of perspectives. Majors are offered in Architecture (p. 144), Chemical Engineering (p. 174), Ecology and Evolutionary Biology (p. 239), Environmental Engineering (p. 298), Environmental Studies (p. 302), and Geology and Geophysics (p. 363). The program in Forestry & Environmental Studies (p. 343) offers courses in environmental science, policy, and management. Many other departments and programs offer courses pertinent to the study of environment, including American Studies (p. 105), Anthropology (p. 118), Chemistry (p. 179), Economics (p. 247), English (p. 276), Global Affairs (p. 381), History (p. 399), History of Art (p. 421), Political Science (p. 575), Sociology (p. 629), and Study of the City (p. 661).

Some professional schools and programs offer relevant courses that may admit undergraduates, including Public Health (<http://publichealth.yale.edu>), Forestry & Environmental Studies (<http://environment.yale.edu>), the Law School (<http://www.law.yale.edu>), and the School of Management (<http://som.yale.edu>).

# Environmental Engineering

Director of undergraduate studies: Jordan Peccia, 313C ML, 432-4385,  
jordan.peccia@yale.edu; seas.yale.edu/departments/chemical-and-environmental-engineering

## FACULTY ASSOCIATED WITH THE PROGRAM IN ENVIRONMENTAL ENGINEERING

**Professors** Michelle Bell (*Forestry & Environmental Studies*), Gaboury Benoit (*Forestry & Environmental Studies*), Ruth Blake (*Geology & Geophysics*), Stephen Edberg (*School of Medicine*), Menachem Elimelech (*Chemical & Environmental Engineering*), Thomas Graedel (*Forestry & Environmental Studies*), Edward Kaplan (*School of Management*), Yehia Khalil (*Adjunct*) (*Chemical & Environmental Engineering*), Lisa Pfefferle (*Chemical & Environmental Engineering*), Joseph Pignatello (*Adjunct*) (*Chemical & Environmental Engineering*), James Saiers (*Forestry & Environmental Studies*)

**Associate Professors** Jaehong Kim (*Chemical & Environmental Engineering*), Jordan Peccia (*Chemical & Environmental Engineering*), Julie Zimmerman (*Chemical & Environmental Engineering*)

**Assistant Professors** Drew Gentner (*Chemical & Environmental Engineering*), Desiree Plata (*Chemical & Environmental Engineering*)

Environmental engineering encompasses the scientific assessment and development of engineering solutions to environmental problems affecting land, water, and air (the biosphere). The field embraces broad environmental concerns, including the safety of drinking water, groundwater protection and remediation, wastewater treatment, indoor and outdoor air pollution, solid and hazardous waste disposal, cleanup of contaminated sites, the prevention of pollution through product and process design, and strategies for sustainable water and energy use and production.

Environmental engineers must balance competing technical, social, and legal issues concerning the use of environmental resources. Because of the complexity of these challenges, environmental engineers need a broad understanding not only of engineering disciplines but also of chemistry, biology, geology, and economics. Accordingly, the program allows students in the major to select an emphasis on environmental engineering technology, sustainability, global health, economics, or energy and climate change. The program prepares students for leadership positions in industry and government agencies or for further studies in engineering, science, business, law, and medicine.

**Requirements of the major** Two degree programs are offered: the B.S. in Environmental Engineering, and the B.A. in Engineering Sciences (Environmental). The B.S. degree program in Environmental Engineering is for students who desire a strong background in environmental engineering leading to a career in the field. The B.A. degree program in Engineering Sciences (Environmental) is intended for students whose careers will involve, but not be dominated by, the skills of environmental engineering. The B.A. program is appropriate for those contemplating a career in which scientific and technological problems can play an important role, as is often the case in law, business, medicine, or public service.

**Prerequisites** The B.S. degree program has the following prerequisites in mathematics and basic sciences: MATH 112, 115; MATH 120 or ENAS 151; ENAS 194; either CHEM 112 and 113 or 114 and 115 with 116L and 117L, or CHEM 118 and 119L by Advanced Placement test only; PHYS 180, 181; and BIOL 101 and 102 or 103 and 104. The B.A. degree program requires MATH 112 and 115; CHEM 112 and 113, or 114 and 115; and PHYS 170, 171.

**B.S. degree program in Environmental Engineering** The B.S. degree program requires at least twelve term courses beyond the prerequisites, including the senior requirement. Students take CENG 300 or MENG 211, ENVE 120, 360, 373, 377, and either 315 or 448, EVST 344, and MENG 361 or F&ES 714. At least three electives must be chosen in consultation with the director of undergraduate studies, preferably within one of the following tracks: environmental engineering technology, sustainability, global health, economics, or energy and climate change.

**B.A. degree program in Engineering Sciences (Environmental)** The B.A. degree program requires nine term courses beyond the prerequisites, including the senior requirement. Students take ENVE 120, 360, and either 373 or 377. Five electives must be chosen in consultation with the director of undergraduate studies.

**Senior requirement** Students in the B.S. program must pass ENVE 416 in their senior year. Students in the B.A. program must pass ENVE 490 in their senior year.

**Credit/D/Fail** No course taken Credit/D/Fail may count toward the major, including prerequisites.

## REQUIREMENTS OF THE MAJOR

### ENVIRONMENTAL ENGINEERING, B.S.

**Prerequisites** MATH 112, 115; MATH 120 or ENAS 151; ENAS 194; either CHEM 112, 113 or 114, 115 with 116L, 117L, or CHEM 118 and 119L by AP test only; PHYS 180, 181; BIOL 101 and 102 or 103 and 104

**Number of courses** 12 term courses beyond prereqs (incl senior req)

**Specific courses required** CENG 300 or MENG 211; ENVE 120, 360, 373, 377; ENVE 315 or 448; EVST 344; MENG 361 or F&ES 714

**Distribution of courses** 3 electives as specified

**Senior requirement** ENVE 416

### ENGINEERING SCIENCES (ENVIRONMENTAL), B.A.

**Prerequisites** MATH 112, 115; either CHEM 112, 113 or 114, 115; PHYS 170, 171

**Number of courses** 9 term courses beyond prereqs (incl senior req)

**Specific courses required** ENVE 120, 360; ENVE 373 or 377

**Distribution of courses** 5 electives approved by DUS

**Senior requirement** ENVE 490

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## Courses

### **ENVE 101b / ENAS 101b / EVST 105b / MENG 101b, Energy, Engines, and Environment** Alessandro Gomez

Energy sustainability and global warming; thermodynamic fundamentals; engines (combustion technologies, fossil-fuel pollution, carbon capture and sequestration). Wind, solar, biomass, and other renewable energy sources. Designed for freshmen and sophomores in science and engineering and for non-science majors. Prerequisite: A score of 4 or 5 on Advanced Placement examinations in mathematics and/or science.  
SC

### \* **ENVE 120b / CENG 120b / ENAS 120b, Introduction to Environmental Engineering** Julie Zimmerman

Introduction to engineering principles related to the environment, with emphasis on causes of problems and technologies for abatement. Topics include air and water pollution, global climate change, hazardous chemical and emerging environmental technologies. Prerequisites: high school calculus and chemistry or CHEM 114, 115 (may be taken concurrently) or permission of instructor. QR, SC

### **ENVE 210a / CENG 210a, Principles of Chemical Engineering and Process Modeling** Lisa Pfefferle

Analysis of the transport and reactions of chemical species as applied to problems in chemical, biochemical, and environmental systems. Emphasis on the interpretation of laboratory experiments, mathematical modeling, and dimensional analysis. Lectures include classroom demonstrations. Prerequisite: MATH 120 or permission of instructor.  
QR, SC RP

### **ENVE 315b / CENG 315b, Transport Phenomena** Chinedum Osuji

Unified treatment of momentum, energy, and chemical species transport including conservation laws, flux relations, and boundary conditions. Topics include convective and diffusive transport, transport with homogeneous and heterogeneous chemical reactions and/or phase change, and interfacial transport phenomena. Emphasis on problem analysis and mathematical modeling, including problem formulation, scaling arguments, analytical methods, approximation techniques, and numerical solutions. Prerequisite: ENAS 194 or permission of instructor. QR, SC RP

### **ENVE 327a / F&ES 327a / G&G 327a, Atmospheric Chemistry** Nadine Unger

The chemical and physical processes that determine the composition of the atmosphere; implications for climate, ecosystems, and human welfare. Origin of the atmosphere; photolysis and reaction kinetics; atmospheric transport of trace species; stratospheric ozone chemistry; tropospheric hydrocarbon chemistry; oxidizing power, nitrogen, oxygen, sulfur, and carbon cycles; interactions between chemistry, climate, and biosphere; aerosols, smog, and acid rain. Prerequisites: CHEM 115 or 118, and MATH 120, or equivalents. ENAS 194 recommended. QR, SC

### **ENVE 360b / ENAS 360b, Green Engineering and Sustainable Design** Staff

Study of green engineering, focusing on key approaches to advancing sustainability through engineering design. Topics include current design, manufacturing, and disposal processes; toxicity and benign alternatives; policy implications; pollution prevention and source reduction; separations and disassembly; material and energy efficiencies and flows; systems analysis; biomimicry; and life cycle design,

management, and analysis. Prerequisites: CHEM 112, 113, or 114, 115, or permission of instructor.

\* **ENVE 373a / CENG 373a, Air Pollution Control** Drew Gentner

Kinetics, thermodynamics, and transport of chemical reactions of common air pollutants including suspended particulate matter. The role of surface chemistry and transport phenomena in air pollution. Pollutant dispersion modeling. Technology available to prevent or control air pollutants. Prerequisite: ENVE 210 or permission of instructor. QR, SC RP

\* **ENVE 377a / CENG 377a, Water Quality Control** Jordan Peccia

Study of the preparation of water for domestic and other uses and treatment of wastewater for recycling or discharge to the environment. Topics include processes for removal of organics and inorganics, regulation of dissolved oxygen, and techniques such as ion exchange, electro dialysis, reverse osmosis, activated carbon adsorption, and biological methods. Prerequisite: ENVE 120 or permission of instructor. SC RP

\* **ENVE 410Lb, Environmental Technology in the Developing World** Jaehong Kim  
Practical application of environmental engineering fundamentals to solve real-world environmental and human-health problems in underdeveloped regions of the world. Issues related to water and wastewater treatment, water- and air-quality monitoring and control, subsurface remediation, and hygienic infrastructure. Includes a weeklong field trip to Nicaragua during spring break. Prerequisites: ENVE 373 and 377. Priority to Environmental Studies majors. ½ Course cr

**ENVE 416b / CENG 416b, Chemical Engineering Process Design**

Paul Van Tassel and Desiree Plata

Study of the techniques for and the design of chemical processes and plants, applying the principles of chemical engineering and economics. Emphasis on flowsheet development and equipment selection, cost estimation and economic analysis, design strategy and optimization, safety and hazards analysis, and environmental and ethical considerations. Prerequisites: CENG 301 and 411. QR, SC RP

[ **ENVE 441, Biological Processes in Environmental Engineering** ]

**ENVE 448a, Environmental Transport Processes** Menachem Elimelech

Analysis of transport phenomena governing the fate of chemical and biological contaminants in environmental systems. Emphasis on quantifying contaminant transport rates and distributions in natural and engineered environments. Topics include distribution of chemicals between phases; diffusive and convective transport; interfacial mass transfer; contaminant transport in groundwater, lakes, and rivers; analysis of transport phenomena involving particulate and microbial contaminants. Prerequisite: ENVE 120 or permission of instructor. QR, SC

**ENVE 473b, Air Quality and Energy** Drew Gentner

The production and use of energy explored as a source of air pollution worldwide. Assessment of emissions and physical/chemical processes; the effects of emissions from energy sources; the behavior of pollutants in energy systems and in the atmosphere. Topics include traditional and emerging energy technology, climate change, atmospheric aerosols, tropospheric ozone, and transport/modeling/mitigation. Prerequisite: ENVE 373 or equivalent. SC

\* **ENVE 490a or b, Senior Project** Jordan Peccia

Individual research and design projects supervised by a faculty member in Environmental Engineering, or in a related field with permission of the director of undergraduate studies.

## Environmental Studies

Director of undergraduate studies: Paul Sabin, 2677 HGS, 436-2516,  
paul.sabin@yale.edu; www.yale.edu/evst

### FACULTY ASSOCIATED WITH THE PROGRAM OF ENVIRONMENTAL STUDIES

**Professors** D. Michelle Addington (*School of Architecture, Forestry & Environmental Studies*), Paul Anastas (*Forestry & Environmental Studies*), Gaboury Benoit (*Forestry & Environmental Studies*), Graeme Berlyn (*Forestry & Environmental Studies*), Ruth Blake (*Geology & Geophysics*), Garry Brewer (*Emeritus*) (*School of Management*), Derek Briggs (*Geology & Geophysics*), Gary Brudvig (*Chemistry, Molecular Biophysics & Biochemistry*), Benjamin Cashore (*Forestry & Environmental Studies*), Peter Crane (*Forestry & Environmental Studies*), Michael Donoghue (*Ecology & Evolutionary Biology, Forestry & Environmental Studies*), Michael Dove (*Forestry & Environmental Studies, Anthropology*), Menachem Elimelech (*Chemical & Environmental Engineering*), John Mack Faragher (*History, American Studies*), Durland Fish (*Public Health, Forestry & Environmental Studies*), Thomas Graedel (*Forestry & Environmental Studies*), Daniel Kevles (*History, History of Medicine*), Benedict Kiernan (*History*), Robert Mendelsohn (*Forestry & Environmental Studies, Economics*), Alan Mikhail (*History*), Mark Pagani (*Geology & Geophysics*), Jeffrey Park (*Geology & Geophysics*), Peter Perdue (*History*), Linda Peterson (*English*), Jeffrey Powell (*Ecology & Evolutionary Biology, Forestry & Environmental Studies*), Peter Raymond (*Forestry & Environmental Studies*), Nicholas Robinson (*Adjunct*) (*Forestry & Environmental Studies*), Susan Rose-Ackerman (*Law School, Political Science*), James Saiers (*Forestry & Environmental Studies*), Oswald Schmitz (*Forestry & Environmental Studies, Ecology & Evolutionary Biology*), James Scott (*Political Science, Anthropology*), Karen Seto (*Forestry & Environmental Studies*), Kalyanakrishnan Sivaramakrishnan (*Anthropology, Forestry & Environmental Studies*), David Skelly (*Forestry & Environmental Studies, Ecology & Evolutionary Biology*), Brian Skinner (*Geology & Geophysics*), Ronald Smith (*Geology & Geophysics, Forestry & Environmental Studies*), Stephen Stearns (*Ecology & Evolutionary Biology*), Charles Tomlin (*Forestry & Environmental Studies*) (*Visiting*), John Wargo (*Forestry & Environmental Studies, Political Science*), Harvey Weiss (*Near Eastern Languages & Civilizations, Anthropology*), John Wettlaufer (*Geology & Geophysics*), Robert Wyman (*Molecular, Cellular, & Developmental Biology*)

**Associate Professors** David Post (*Ecology & Evolutionary Biology*), Paul Sabin (*History*), Julie Zimmerman (*Chemical & Environmental Engineering*)

**Assistant Professors** Hagit Affek (*Geology & Geophysics*), Mark Bradford (*Forestry & Environmental Studies*), Alex Felson (*Forestry & Environmental Studies*), Anjelica Gonzalez (*Biomedical Engineering*), Karen Hébert (*Forestry & Environmental Studies, Anthropology*), William Rankin (*History, History of Science*), David Vasseur (*Ecology & Evolutionary Biology*), Zhengrong Wang (*Geology & Geophysics*)



**Senior Lecturers** Shimon Anisfeld, Carol Carpenter, Amity Doolittle, John Grim, Fred Strebeigh

**Lecturers** Mary Beth Decker, Kealoha Freidenburg, Gordon Geballe, Linda Puth, Catherine Skinner, Carl Zimmer

Environmental Studies provides an interdisciplinary approach to understanding and solving environmental problems. From the natural sciences, students learn experimental techniques and methods of analysis needed to make accurate observations, to document change, to distinguish those changes resulting from human activity, and to understand what comprises healthy landscapes and functioning ecosystems. Students look to the humanities and social sciences for explanations of the ways people behave and for analyses of our institutions and their social, political, and economic activities. The Environmental Studies major prepares students for graduate study in a range of disciplines including law, medicine, and public health, and for careers in business, environmental management and conservation, teaching, and writing.

**Prerequisites** The major requires preparation in chemistry, biology, laboratory or field training, and either mathematics, physics, or statistics. The general chemistry prerequisite is fulfilled by CHEM 112 and 113, or 114 and 115, or 118. The introductory biology prerequisite includes BIOL 101 and 102, or G&G 125, or MCDB 123. A natural science laboratory or field course focusing on research and analytic methods is chosen from CHEM 116L, 117L, 119L, EVST 221, 234L, 244, or G&G 126L. A term course in mathematics, physics, or statistics is selected from MATH 112 or above (excluding MATH 190), PHYS 170 or above, or STAT 101 or above. Students are advised to take chemistry and biology during the freshman year before enrolling in the EVST core courses in natural sciences. It is recommended that students complete the prerequisites by the end of the fall term in their sophomore year, prior to application to the major (see below), although this is not required. Where relevant, students may employ acceleration credit to fulfill the prerequisites.

**Requirements of the major** In addition to the prerequisites, twelve and one-half or thirteen and one-half course credits are required for the major, including four core courses, one core laboratory, a departmental seminar, a concentration of six courses, and a one- or two-term senior project and colloquium (EVST 496). All courses in the major must be taken for a letter grade.

**Core courses** Students are required to take at least two core courses in the humanities and social sciences selected from EVST 120, 226, 255, 340, or 345. They must also take the environmental science core courses EVST 201, 202L, and 223. Completing one course in each area is recommended before the end of the sophomore year.

**Departmental seminar** All majors must complete a departmental seminar approved by the director of undergraduate studies. This requirement may be completed in any year of study. Seminars already approved include EVST 215, 285, and 290.

**Area of concentration** Students plan their concentration in consultation with the director of undergraduate studies and the student's adviser. A concentration is defined as six courses that provide depth in a problem or issue of interest, as well as disciplinary expertise. Past concentrations have included biodiversity, climate change,

energy, environmental history, food and agriculture, human health, resource use and sustainability, and urban planning. Students also have the opportunity to design a unique concentration within the major, working with the director of undergraduate studies.

**Senior requirement** Seniors must complete one or two terms of an independent research project and colloquium, taken as EVST 496. One-term senior essays require the permission of the director of undergraduate studies. In the junior year, students consult with their advisers on the design of the project and submit a preliminary plan to the director of undergraduate studies for approval.

**Application to the Environmental Studies major** Students typically apply to enter the major during their sophomore year. Application must be made in writing to the director of undergraduate studies during the designated application period in either the fall or the spring term; details can be found on the program's Web site (<http://www.yale.edu/evst>). Juniors who have already completed considerable course work toward the major may also apply during the designated application period. Students considering a major in Environmental Studies should consult the director of undergraduate studies as early as possible in the freshman year.

**Summer environmental internship** During the summer between the junior and senior years, many students gain experience in the field through research or internships in an area pertinent to their senior research project. Internships may be arranged with nonprofit organizations, government agencies, or corporations. Although the summer program is optional, many students take advantage of this opportunity with some financial support from the program.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** CHEM 112 and 113, or 114 and 115, or 118; BIOL 101 and 102, or G&G 125, or MCDB 123; CHEM 116L, 117L, 119L, EVST 221, 234L, 244, or G&G 126L; MATH 112 or above (excluding MATH 190), PHYS 170 or above, or STAT 101 or above

**Number of courses** 12½ or 13½ course credits beyond prereqs, incl one- or two-term senior project

**Specific courses required** EVST 201, 202L, 223; 2 from EVST 120, 226, 255, 340, 345

**Distribution of courses** 1 departmental sem, 6 courses in area of concentration

**Senior requirement** One- or two-term research project and colloq (EVST 496)

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## Introductory Courses

### \* EVST 010a / G&G 010a, *Earth, Resources, Energy, and the Environment*

David Evans

Humankind's interactions with, and place within, the natural world. Plate tectonics and natural disasters, biological evolution and mass extinction, human evolution, population growth and ecology, industrial resources, groundwater and pollution, fossil fuels and energy transitions, the carbon cycle and greenhouse gases, paleoclimates, current global warming, alternative energies, and a planetary perspective on the Earth as a singular oasis in space. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SC

**\* EVST 020a / F&ES 020a, Sustainable Development in Haiti** Gordon Geballe

The principles and practice of sustainable development explored in the context of Haiti's rich history and culture, as well as its current environmental and economic impoverishment. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR

**\* EVST 100a / APHY 100a / ENAS 100a / G&G 105a / PHYS 100a, Energy Technology and Society** Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non-science majors with strong backgrounds in math and science. Enrollment limited to 24. For application instructions, visit the course site on Classes\*v2 (<http://classesv2.yale.edu>). QR, SC

**EVST 105b / ENAS 101b / ENVE 101b / MENG 101b, Energy, Engines, and Environment** Alessandro Gomez

Energy sustainability and global warming; thermodynamic fundamentals; engines (combustion technologies, fossil-fuel pollution, carbon capture and sequestration). Wind, solar, biomass, and other renewable energy sources. Designed for freshmen and sophomores in science and engineering and for non-science majors. Prerequisite: A score of 4 or 5 on Advanced Placement examinations in mathematics and/or science. SC

## Core Courses

### HUMANITIES AND SOCIAL SCIENCES

**EVST 120a / AMST 163a / HIST 120a / HSHM 204a, Introduction to Environmental History** Paul Sabin

Ways in which people have shaped and been shaped by the changing environments of North America from precolonial times to the present. Migration of species and trade in commodities; contrasting uses of land; the impact of industry and markets; the rise of modern conservation and environmental movements; the development of public policy; the global search for resources by the United States. HU

**EVST 189b / HIST 246b / HUMS 457b, The History of Food** Paul Freedman

The history of food and culinary styles from prehistory to the present, with a particular focus on Europe and the United States. How societies gathered and prepared food. Changing taste preferences over time. The influence of consumers on trade, colonization, and cultural exchange. The impact of colonialism, technology, and globalization. The current food scene and its implications for health, the environment, and cultural shifts. HU

**EVST 255b / F&ES 255b / PLSC 215b, Environmental Politics and Law** John Wargo

Exploration of the politics, policy, and law associated with attempts to manage environmental quality and natural resources. Themes of democracy, liberty, power, property, equality, causation, and risk. Case histories include air quality, water quality and quantity, pesticides and toxic substances, land use, agriculture and food, parks and protected areas, and energy. SO

**\* EVST 281a / PLSC 387a, Resource Management in Canada** Graeme Auld

Canada's historical and contemporary approaches to managing its natural resources. The institutional context of resource governance; changing policies and practices over

the past several decades; domestic and international drivers of policy change. Examples from the mining, water, forestry, fisheries, and oil and gas sectors.

\* **EVST 303b / PLSC 388b, Movements, Markets, and Resources** Graeme Auld  
Political struggles over the control, management, and use of natural resources in markets. The history of market activism, from boycotts of individual corporations or countries to institutionalized market regulations such as business codes of conduct, public-private partnerships, and certification. Case studies from different countries and market sectors.

**EVST 340b / ECON 330b, Economics of Natural Resources** Robert Mendelsohn  
Microeconomic theory brought to bear on current issues in natural resource policy. Topics include regulation of pollution, hazardous waste management, depletion of the world's forests and fisheries, wilderness and wildlife preservation, and energy planning. After introductory microeconomics. QR, SO

\* **EVST 345a / ANTH 382a / F&ES 384a, Environmental Anthropology**  
Carol Carpenter

History of the anthropological study of the environment: nature-culture dichotomy, ecology and social organization, methodological debates, politics of the environment, and knowing the environment. SO

\* **EVST 358b / WGSS 365b, Gender, Justice, and the Environment**  
Vanessa Agard-Jones

The intersection between feminist theory and environmental justice. Relationships between gendered beings, both human and nonhuman, and the environments in which they live. Feminist theories of nature and materiality; bodies and environmental toxicities; reproductive rights and population impact; gendered conflicts over the meaning of "sustainable development"; interspecies connections; the sociopolitical contexts of environmental disasters. HU

## ENVIRONMENTAL SCIENCE

**EVST 201a / G&G 140a, Atmosphere, Ocean, and Environmental Change**  
Ronald Smith

Physical processes that control Earth's atmosphere, ocean, and climate. Quantitative methods for constructing energy and water budgets. Topics include clouds, rain, severe storms, regional climate, the ozone layer, air pollution, ocean currents and productivity, the seasons, El Niño, the history of Earth's climate, global warming, energy, and water resources. Must be taken concurrently with EVST 202L. QR, SC

\* **EVST 202La / G&G 141La, Laboratory for Atmosphere, Ocean, and Environmental Change** Ronald Smith

Laboratory and field exercises to accompany EVST 201. Must be taken concurrently with EVST 201. SC ½ Course cr

**EVST 223a / E&EB 220a, General Ecology** David Post and Ann Staver

The theory and practice of ecology, including the ecology of individuals, population dynamics and regulation, community structure, ecosystem function, and ecological interactions at broad spatial and temporal scales. Topics such as climate change, fisheries management, and infectious diseases are placed in an ecological context. Prerequisite: MATH 112 or equivalent. SC

## Intermediate and Advanced Courses

The following courses have been approved for developing areas of concentration. Other courses may be suitable for designing an area of concentration with permission of the director of undergraduate studies.

**\* EVST 200b / G&G 115b, Earth System Science** Jeffrey Park

A survey of geoscience. Interaction of lithosphere, hydrosphere, atmosphere, and Earth's deep interior; natural controls on environment and climate in past, present, and future; rocks, minerals, glaciers, earthquakes, and volcanoes; natural hazards and natural resources. (Formerly G&G 200) SC

**\* EVST 234La, Field Science: Environment and Sustainability**

L. Kealoha Freidenburg

A field course that explores the effects of human influences on the environment. Analysis of pattern and process in forested ecosystems; introduction to the principles of agroecology, including visits to local farms; evaluation of sustainability within an urban environment. Weekly field trips and one weekend field trip. SC

**\* EVST 244a, Coastal Environments in a Changing World** Mary Beth Decker

The effects of human action and natural phenomena on coastal marine ecosystems. Methods used by coastal scientists to address environmental issues; challenges associated with managing and conserving coastal environments. Priority to Environmental Studies majors; open to nonmajors as space permits. SC

**EVST 250b / ANTH 245b, Nature and Globalization** Karen Hébert

Examination of contemporary human relations to nature. Origins and consequences of the predominant ways humans interact with and conceive of the environment. Case studies explore histories, theories, and experiences of resource production and consumption, development and conservation, environmental management and governance, and climate change and ecological risk. SO

**\* EVST 258b / AMST 258b, Wilderness in the North American Imagination**

Sigma Colon

The idea of wilderness in American history, art, film, public policy, and literature, from the Puritans to the present. Authors include Thoreau, Faulkner, Jack London, Mary Rowlandson, Aldo Leopold, and Rachel Carson. A weekend field trip is held early in the term. HU

**\* EVST 260a / F&ES 260a, Structure, Function, and Development of Vascular Plants**

Graeme Berlyn

Morphogenesis and adaptation of trees from seed formation and germination to maturity. Physiological and developmental processes associated with structural changes in response to environment are discussed from both a phylogenetic and an adaptive point of view. SC

**\* EVST 261a / F&ES 261a / G&G 261a, Minerals and Human Health** Ruth Blake

Study of the interrelationships between Earth materials and processes and personal and public health. The transposition from the environment of the chemical elements essential for life. After one year of college-level chemistry or with permission of instructor; G&G 110 recommended. SC

\* **EVST 302b, Biophilia and Human Well-Being** Stephen Kellert

Exploration of biophilia, the innate human inclination to affiliate with natural systems and processes. Attention to both the concept and its practical applications. Biophilia's relation to human physical and mental health; the role of learning, experience, and social support in developing biophilia in individuals and cultures; ways people attach meaning to and derive benefit from nature; modern trends that impede the development of biophilia; methods for mitigating such trends.

**EVST 307a / F&ES 307a, Organic Pollutants in the Environment** Shimon Anisfeld

An overview of the pollution problems posed by toxic organic chemicals, including petroleum, pesticides, PCBs, dioxins, chlorinated solvents, and emerging contaminants. Processes governing the environmental fate of organic pollutants, e.g., evaporation, bioconcentration, sorption, and biodegradation. Technologies for prevention and remediation of organic pollution. No background in organic chemistry required.

\* **EVST 323a / EAST 444a / HIST 332Ja, China's Environmental History since 1600**

Jonathan Schlesinger

Recent scholarship on climate change, resource management, water conservancy, public sanitation, and the shifting meanings of nature in Chinese culture and science from the early modern period to the present. Ways in which Chinese history and the natural environment have shaped one another; relations between China's environmental history and contemporary global trends. HU

\* **EVST 325a / ENGL 248a / HUMS 166a, Nature Writing in Britain and the English-Speaking World** Linda Peterson

Natural history and environmental writing in the English-speaking world from the late eighteenth century to the present. Readings include Gilbert White's *Natural History of Selborne*, Thoreau's *Walden*, and Darwin's *Voyage of the Beagle*, as well as recent work by writers from Canada, the United States, India, and South Africa. Pre-1900 with permission of instructor. WR, HU

\* **EVST 344b / F&ES 344b, Aquatic Chemistry** Gaboury Benoit

A detailed examination of the principles governing chemical reactions in water. Emphasis on developing the ability to predict the aqueous chemistry of natural, engineered, and perturbed systems based on a knowledge of their biogeochemical setting. Calculation of quantitative solutions to chemical equilibria. Focus on inorganic chemistry. Topics include elementary thermodynamics, acid-base equilibria, alkalinity, speciation, solubility, mineral stability, redox chemistry, and surface complexation reactions. SC

**EVST 347a, Biogeochemistry and Pollution** Gaboury Benoit

Introduction to biogeochemistry and to the nature and behavior of environmental pollutants, including chemical, biological, and physical processes. The fundamental classes of chemical reactions in the environment; critical analysis of chemical data; sampling techniques; analytical methods; natural biogeochemical controls on environmental chemistry. Case studies examine contaminants of special interest such as acid precipitation, nutrients, and sewage.

\* **EVST 348b, Yellowstone and Global Change** Susan Clark

Introduction to sustainability issues in natural resource management and policy, using the Greater Yellowstone ecosystem as a case study. Topics include large carnivores,

wildlife conservation, parks, energy, and transportation. Priority to Environmental Studies majors.

\* **EVST 362b / ARCG 362b / G&G 362b, Observing Earth from Space** Xuhui Lee  
A practical introduction to satellite image analysis of Earth's surface. Topics include the spectrum of electromagnetic radiation, satellite-borne radiometers, data transmission and storage, computer image analysis, the merging of satellite imagery with GIS and applications to weather and climate, oceanography, surficial geology, ecology and epidemiology, forestry, agriculture, archaeology, and watershed management. Prerequisites: college-level physics or chemistry, two courses in geology and natural science of the environment or equivalents, and computer literacy. QR, SC

\* **EVST 366b / AMST 364b / FILM 423b, Documentary and the Environment**  
Charles Musser  
Survey of documentaries about environmental issues, with a focus on *Darwin's Nightmare* (2004), *An Inconvenient Truth* (2006), *Food, Inc.* (2009), *GasLand* (2010), and related films. Brief historical overview, from early films such as *The River* (1937) to the proliferation of environmental film festivals. HU RP

\* **EVST 399a, Agriculture: Origins, Evolution, Crises** Harvey Weiss  
Analysis of the societal and environmental drivers and effects of plant and animal domestication, the intensification of agroproduction, and the crises of agroproduction: land degradation, societal collapses, sociopolitical transformation, sustainability, and biodiversity. SO

\* **EVST 415b / BENG 405b, Biotechnology and the Developing World**  
Anjelica Gonzalez  
Study of technological advances that have global health applications. Ways in which biotechnology has enhanced quality of life in the developing world. The challenges of implementing relevant technologies in resource-limited environments, including technical, practical, social, and ethical aspects. Prerequisite: MCDB 120, or BIOL 101 and 102.

\* **EVST 422a / ANTH 409a / F&ES 422a, Anthropology of Climate Change, Past and Present** Michael Dove  
The history of thinking regarding climate and society. Climate theory from the classical era and the Enlightenment; modern anthropological literature on social and environmental change, climatic vulnerability and control, and climate knowledge and its circulation. SO

\* **EVST 443b / HIST 180Jb, Energy in American History** Paul Sabin  
The history of energy in United States since the early nineteenth century. America's global quest for oil; changing national energy policies; relations between energy producers and communities; political resistance to energy projects; and social, cultural, and environmental transformations associated with energy production and consumption. HU

\* **EVST 473b / ANTH 473b / ARCG 473b, Abrupt Climate Change and Societal Collapse** Harvey Weiss  
The coincidence of societal collapses throughout history with decadal and century-scale drought events. Challenges to anthropological and historical paradigms of cultural

adaptation and resilience. Examination of archaeological and historical records and high-resolution sets of paleoclimate proxies. HU, SO

## Departmental Seminars

\* **EVST 215a / ENGL 459a, Scientific and Environmental Writing** Carl Zimmer  
An intensive workshop in writing about science and the environment for a broad audience. Translating complex subjects into elegant prose, conducting interviews, handling controversies, researching articles, and finding one's voice. Readings include exemplary works ranging from newspaper articles to book excerpts. WR RP

\* **EVST 285b / F&ES 285b, Political Ecology: Nature, Culture, and Power**  
Amity Doolittle  
Study of the relationship between society and the environment. Global processes of environmental conservation, development, and conflicts over natural resource use; political-economic contexts of environmental change; ways in which understandings of nature are discursively bound up with notions of culture and identity. SO

\* **EVST 290b / F&ES 290b, Geographic Information Systems** Charles Tomlin  
A practical introduction to the nature and use of geographic information systems (GIS) in environmental science and management. Applied techniques for the acquisition, creation, storage, management, visualization, animation, transformation, analysis, and synthesis of cartographic data in digital form.

## Senior Project

\* **EVST 496a or b, Senior Research Project and Colloquium** Jeffrey Park  
Independent research under the supervision of members of the faculty, resulting in a senior essay. Students meet with peers and faculty members regularly throughout the fall term to discuss the progress of their research. Projects should offer substantial opportunity for interdisciplinary work on environmental problems. Students typically complete a two-term senior essay, but students completing the requirements of two majors may consider a one-term senior project.

## Ethics, Politics, and Economics

Director of undergraduate studies: Andrew March, 31 Hillhouse Ave., 432-7178, [andrew.march@yale.edu](mailto:andrew.march@yale.edu); [epe.yale.edu](http://epe.yale.edu)

### FACULTY ASSOCIATED WITH THE PROGRAM OF ETHICS, POLITICS, AND ECONOMICS

**Professors** Seyla Benhabib (*Political Science, Philosophy*), Dirk Bergemann (*Economics*), Donald Brown (*Economics*), David Cameron (*Political Science*), Ron Eyerman (*Sociology*), Bryan Garsten (*Political Science*), Shelly Kagan (*Philosophy*), Ioannis Kessides (*Visiting*), Joseph LaPalombara (*Emeritus*) (*Political Science*), Thomas Pogge (*Philosophy*), Douglas Rae (*Political Science*), John Roemer (*Political Science*), Susan Rose-Ackerman (*Political Science, Law School*), Andrew Sabl (*Visiting*), Nicholas Sambanis (*Director*) (*Political Science*), Ian Shapiro (*Political Science*), Peter Swenson (*Political Science*), Steven Wilkinson (*Political Science*)

**Senior Lecturer** Boris Kapustin (*Global Affairs*)



**Lecturers** Seok-ju Cho (*Political Science*), Alexandra Dufresne (*Political Science*), Michael Fotos (*Political Science*), Steohan Latham (*Political Science*), Christopher Lebron (*Political Science*), Vikram Mansharamani (*Global Affairs*)

In an era of global interdependence and rapid technological change, we need to think practically about the institutional dynamics of power and governance. We have to understand the technical complexities of economic and statistical analysis at the same time that we think critically about basic moral and political choices. Constructive responses to such problems as coping with natural and social hazards, allocation of limited social resources (e.g., medical care), or morally sensitive political issues (e.g., affirmative action and war crimes) require close knowledge of their political, economic, and social dimensions, and a capacity to think rigorously about the basic questions they raise.

The major in Ethics, Politics, and Economics joins the analytic rigor of the social sciences and the enduring normative questions of philosophy to promote an integrative and critical understanding of the institutions, practices, and policies that shape the contemporary world.

**Requirements of the major** Fourteen term courses are required for the major, including five introductory courses, one intermediate microeconomics course, three core courses, one advanced seminar, and four courses comprising a student's individual area of concentration. The concentration is developed in consultation with the director of undergraduate studies and should culminate in a senior essay written in the area defined by the concentration.

**Introductory courses** Introductory courses provide a basic familiarity with contemporary economic analysis and survey central issues in ethics and political philosophy. Such a background is necessary to understand theories that combine different approaches to the three areas of inquiry and to assess policies with complex social, economic, and moral implications.

The five introductory courses include two in economics (microeconomics and macroeconomics), one in political philosophy, one in ethics, and one in statistics. An intermediate course in microeconomics is also required.

**Core courses** Three core courses comprise the center of the major in Ethics, Politics, and Economics. The first core course, required for all majors, is EP&E 215, Classics of Ethics, Politics, and Economics. Students must complete two additional core courses, each selected from a different one of the following three groups: rationality and social choice, political systems, and social theory and cultural analysis. The three core courses must be taken before the senior year. Core courses are indicated by the designations "Rationality Core," "PoliticalSystems Core," and "Social Theory Core" in the course listings in this bulletin and are listed by group on the program's Web site (<http://epe.yale.edu/undergraduate-information/requirements-major/#corereq>).

**Advanced seminars** All majors must complete one advanced seminar. The course is selected from an approved group of seminars that focus on how core modes of reasoning drawn from the major's three areas of inquiry can be applied to a particular area or problem. Courses that fulfill the advanced seminar requirement are indicated by the designation "Advanced Seminar" in the course listings in this bulletin and are listed

by group on the program's Web site (<http://epe.yale.edu/undergraduate-information/requirements-major/#corereq>).

**Area of concentration** Each student defines an area of concentration in consultation with the director of undergraduate studies. The concentration enables students to frame an important problem and shape a systematic course of inquiry, employing analytical methods and substantive theories drawn from the three fields. Students should not only recognize the accomplishments of varied interdisciplinary efforts, but also attempt to represent and in some cases further develop those accomplishments in their own work.

For many students the concentration treats a contemporary problem with a substantial policy dimension (domestic or international), but some students may wish to emphasize philosophical and methodological issues. Areas of concentration must consist of four courses appropriate to the theme, including the seminar or independent study course in which the senior essay is written (see "Senior essay" below). In designing the area of concentration, students are encouraged to include seminars from other departments and programs. The director of undergraduate studies will also require students to show adequate competence in data analysis when the area of concentration requires it.

The following are examples of possible areas of concentration: distributive justice; government regulation of market economies; environmental policy; philosophy of law; gender relations; democracy and multiculturalism; contemporary approaches to public policy; war and coercion; war crimes and crimes against humanity; medical ethics; international political economy; philosophy of the social sciences; social theory and ethics; cultural analysis and political thought; civil society and its normative implications.

Some graduate and professional school courses are open to qualified undergraduates and may be of interest to EP&E majors, (e.g., courses in the Schools of Nursing, Forestry & Environmental Studies, Management, and Public Health). Permission to enroll is required from the instructor as well as the appropriate representative of the graduate or professional program. Note that not all professional school courses yield a full course credit in Yale College. See Courses in the Yale Graduate and Professional Schools (p. 68) in the Academic Regulations.

**Senior essay** A senior essay is required for the major and should constitute an intellectual culmination of the student's work in Ethics, Politics, and Economics. The essay should fall within the student's area of concentration and may be written within a relevant seminar, with the consent of the instructor and approval of the director of undergraduate studies. If no appropriate seminar is offered in which the essay might be written, the student may instead enroll in EP&E 491 with approval of the director of undergraduate studies and a faculty member who will supervise the essay. Students who wish to undertake a more substantial yearlong essay may enroll in EP&E 492, 493.

The senior essay reflects more extensive research than an ordinary Yale College seminar paper and employs a method of research appropriate to its topic. Some papers might be written entirely from library sources; others may employ field interviews and direct observation; still others may require statistical or econometric analysis. The student

should consult frequently with the seminar instructor or adviser, offering partial and preliminary drafts for criticism.

Senior essays written in the fall term are due December 8, 2014. Senior essays written in the spring term and yearlong essays are due April 13, 2015. One-term essays are normally expected to be forty to fifty pages in length; yearlong essays are normally expected to be eighty to one hundred pages in length.

**Credit/D/Fail** Students admitted to the major may take any one of their Ethics, Politics, and Economics courses Credit/D/Fail. Such courses count as non-A grades in calculations for Distinction in the Major.

**Application to the Ethics, Politics, and Economics major** Students must apply to enter the major at the end of the fall term of their sophomore year. Applications must be submitted via e-mail to the program's registrar at [kellianne.farnham@yale.edu](mailto:kellianne.farnham@yale.edu) no later than 4 p.m. on Friday, December 5, 2014. Applications must include the application cover sheet, a transcript of work at Yale that indicates fall-term 2014 courses, and a brief application essay, all in PDF format. If possible, applicants should include a copy of a paper written for a course related to the subject matter of Ethics, Politics, and Economics. More information regarding the application process and the cover sheet is available on the program's Web site (<http://epe.yale.edu/undergraduate-information/applying-major>).

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 14 (incl senior req)

**Specific course required** EP&E 215

**Distribution of courses** 1 intro course each in microeconomics, macroeconomics, political phil, ethics, and stat; 1 intermediate microeconomics course; 2 adtl core courses, as specified; 1 advanced sem, as specified; 4 courses, incl course for senior req, in area of concentration defined by student in consultation with DUS

**Senior requirement** Senior essay in area of concentration (in a sem or in EP&E 491 or in EP&E 492 and 493)

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#### EP&E 203a / PLSC 452a / STAT 102a, Introduction to Statistics: Political Science

Jonathan Reuning-Scherer and Alan Gerber

Statistical analysis of politics, elections, and political psychology. Problems presented with reference to a wide array of examples: public opinion, campaign finance, racially motivated crime, and public policy. QR

EP&E: Intro Statistics

#### EP&E 204a / ENAS 335a, Professional Ethics Mercedes Carreras

A theoretical and case-oriented approach to ethical decision making. Concepts, tools, and methods for constructing and justifying solutions to moral problems that students may face as professionals. SO

**EP&E 209a / PLSC 453a / STAT 103a, Introduction to Statistics: Social Sciences**

Jonathan Reuning-Scherer

Descriptive and inferential statistics applied to analysis of data from the social sciences. Introduction of concepts and skills for understanding and conducting quantitative research. QR

EP&amp;E: Intro Statistics

**\* EP&E 215a or b, Classics of Ethics, Politics, and Economics** Staff

A critical examination of classic and contemporary works that treat problems of ethics, politics, and economics as unities. Topics include changing conceptions of private and public spheres, the content and domain of individual freedom, and ethical and political limits to the market. Readings from the works of Aristotle, Hobbes, Locke, Smith, Bentham, Mill, Hegel, Marx, Hayek, Rawls, and others. HU, SO

**\* EP&E 222a, Theories of Political Institutions** Seok-Ju Cho

A survey of theories of political institutions. Topics include normative frameworks for institutional choices, rational-choice and game-theoretic models of political institutions, and the empirical variations of democratic institutions in the current world. SO

**\* EP&E 224a / ECON 465a / GBL 330a, Debating Globalization** Ernesto Zedillo

Facets of contemporary economic globalization, including trade, investment, and migration. Challenges and threats of globalization: inclusion and inequality, emerging global players, global governance, climate change, and nuclear weapons proliferation.

Prerequisite: background in international economics and data analysis. Preference to seniors majoring in Economics or EP&E. SO RP

EP&amp;E: Rationality Core

**[ EP&E 227, Equality ]****\* EP&E 228b / ECON 462b / GBL 316b / LAST 410b, The Economics of Human Capital in Latin America** Douglas McKee

Economic issues related to a population's education, skills, and health; focus on contemporary Latin American societies. Determinants of health and education; evaluation of human capital development policies; the role of human capital in a variety of economic contexts, including the labor market, immigration, child investment, intrahousehold bargaining, inequality, and poverty. Prerequisites: intermediate microeconomics and econometrics. SO

EP&amp;E: Rationality Core

**\* EP&E 230a, Self-Interest and Its Critics** Andrew Sabl

Debates surrounding the concept of self-interest from the seventeenth century to the present. Defining self-interest, its nature, and its limits, and distinguishing it from other motives for behavior; advantages and disadvantages of assuming self-interested motives for human actions; current scholarship on economic rationality, rational choice in political science, and philosophical ethics. SO

**[ EP&E 236, Ethics and the Multinational Business Firm ]****[ EP&E 238, Leadership, Coordination, and Focal Points ]**

\* **EP&E 242a / PLSC 372a, Politics and Markets** Peter Swenson

Examination of the interplay between market and political processes in different substantive realms, time periods, and countries. Inquiry into the developmental relationship between capitalism and democracy, including the developmental and functional relationships between the two. Investigation of the politics of regulation in areas such as property rights, social security, international finance, and product, labor, and service markets. Topics include the economic motives of interest groups and coalitions in the political process. so

EP&E: PoliticalSystems Core

\* **EP&E 243b / GLBL 336b / LAST 423b / PLSC 423b, Political Economy of Poverty Alleviation** Ana De La O Torres

Overview of classic and contemporary approaches to the question of why some countries have done better than others at reducing poverty. Emphasis on the role of politics. so

\* **EP&E 245a / PLSC 152a, Global Firms and National Governments**

Joseph LaPalombara

The type and magnitude of foreign direct investments made by a relatively small number of large firms, and the political influence such firms exercise. Complex challenges raised by powerful global firms emerging from once-dependent and less-developed countries such as China, India, and Brazil. Discussion of the present and probable future relationships between economic and governmental organizations that result from the processes of globalization. Case studies illustrate specific problems faced by both corporate leaders and national and subnational public-policy officials. so

EP&E: PoliticalSystems Core

\* **EP&E 246a / AFST 420a / LAST 406a / PLSC 430a, The Politics of Development Assistance** David Simon

Study of development assistance, a dominant feature of the political economies of some of the world's poorest countries. The motivations and politics of aid from donors' perspectives; the political and economic impact of aid on developing countries. Proposals to make aid a more effective instrument of development. so

EP&E: PoliticalSystems Core

\* **EP&E 248b / PLSC 256b, American Political Institutions** Michael Fotos

The origins and development of American political institutions, especially in relation to how institutions shape the policy process. Issues of temporality, policy feedback, and policy substance. so

EP&E: PoliticalSystems Core

\* **EP&E 250a / PLSC 354a, The European Union** David Cameron

Origins and development of the European Community and Union over the past fifty years; ways in which the often-conflicting ambitions of its member states have shaped the EU; relations between member states and the EU's supranational institutions and politics; and economic, political, and geopolitical challenges. so

EP&E: PoliticalSystems Core

\* **EP&E 258b / PLSC 446b / SOCY 369b, Welfare States across Nations** Sigrun Kahl

How different societies counterbalance capitalism and deal with social risks. Welfare state regimes and their approaches to inequality, unemployment, poverty, illness,

disability, child rearing, and old age. Why the United States has an exceptionally small welfare state. SO

EP&E: PoliticalSystems Core

**\* EP&E 259b / PLSC 183b, Europe, the United States, and the Iraq Crisis**

Jolyon Howorth

Examination of the contrasting relations between the main European powers and the United States in their approaches to Iraq in order to understand the divisions attending the 2003 war and the subsequent transfer of sovereignty. Topics include the Iran-Iraq War (1980–88), the first Persian Gulf crisis (1990–91), the sanctions regime (1991–2002), problems of peacekeeping and nation building, and the Obama exit strategy. SO

EP&E: PoliticalSystems Core

**EP&E 265a / ENGL 344a / ER&M 236a, Global Fictions** Justin Neuman

Narrative literature from the late nineteenth century to the present that explores and reflects the dialectics of globalization. Vectors of globalization examined include energy systems, commodity capitalism, war, and sexuality. Works by Verne, Kafka, Forster, Duras, Bolaño, and others. WR, HU

EP&E: Social Theory Core

**\* EP&E 267a / SOCY 216a / WGSS 314a, Social Movements** Ron Eyerman

An introduction to sociological perspectives on social movements and collective action, exploring civil rights, student movements, global justice, nationalism, and radical fundamentalism. SO

EP&E: Social Theory Core

**\* EP&E 269a / EAST 408a / SOCY 395a, Wealth and Poverty in Modern China**

Deborah Davis

The underlying causes and consequences of the changing distribution of income, material assets, and political power in contemporary China. Substantive focus on inequality and stratification. Instruction in the use of online Chinese resources relevant to research. Optional weekly Chinese language discussions. Prerequisite: a previous course on China since 1949. SO

EP&E: Social Theory Core

**\* EP&E 270a, Lies and Deception** Staff

Introduction to the philosophical debate about the nature of lies and deception. Definitions of lying and deception, including whether all lies necessarily aim to deceive; moral justifications for lying and deceit and their counterarguments; ways in which the moral arguments against deception of others can apply to self-deception. Recommended preparation: EP&E 215 and a course in political philosophy. SO

**\* EP&E 271b / AFST 447b / ER&M 271b / PLSC 447b, The Rwandan Genocide in Comparative Context** David Simon

An examination of the 1994 Rwandan genocide: historical sources of the conflict, the motivations of the killers, actions and reactions of outside actors, efforts to reconstruct a post-genocide society, and continuation of the genocidal dynamic within the Great Lakes region. Consideration of other countries in similar situations, as well as other genocides in recent decades. SO

EP&E: Social Theory Core

\* **EP&E 273a / MMES 343a / RLST 291a / SOCY 343a, Sociology of Islam**

Jonathan Wyrzten

Social scientific studies of Islam; introduction to sociology of religion and its application to Islam; the utility of "Islam" and "Muslim" as analytical categories; debates about definitions of Islam and religion in anthropology and religious studies; comparative sociological studies both within Islam and contrasting Islam with other religions. SO

\* **EP&E 276a / PLSC 292a, Rethinking Sovereignty, Human Rights, and Globalization**

Seyla Benhabib

Discussion of the crises of sovereignty and the end of sovereignty. Postnationalist, cosmopolitan, and neoliberal criticisms of sovereignty. Traditional models of sovereignty compared with cosmopolitan alternatives; implications of these models for the definition and enforcement of rights. Readings include works by Hobbes, Kant, Rousseau, Austin, Schmitt, Kelsen, Habermas, Waldron, Pogge, Sassen, and Aleinikoff. SO

\* **EP&E 285b / PLSC 122b, Humanitarian Intervention** Jolyon Howorth

Analysis of Western intervention in humanitarian crises since the end of the Cold War. Case studies from Kurdistan, Somalia, Bosnia-Herzegovina, Kosovo, Ivory Coast, Libya, and Mali. Reasons for nonintervention in Rwanda, Darfur, and Syria. Ethics of the humanitarian dimension; politics of coalitions of the willing; the material dimension of interest; the effectiveness of humanitarian intervention in achieving its stated objectives. SO

EP&E: PoliticalSystems Core

\* **EP&E 286b / ECON 475b, Discrimination in Law, Theory, and Practice**

Gerald Jaynes

How law and economic theory define and conceptualize economic discrimination; whether economic models adequately describe behaviors of discriminators as documented in court cases and government hearings; the extent to which economic theory and econometric techniques aid our understanding of actual marketplace discrimination. Prerequisites: introductory microeconomics and at least one additional course in Economics, African American Studies, Ethnicity, Race, and Migration, or Women's, Gender, and Sexuality Studies.

EP&E: PoliticalSystems Core

\* **EP&E 287a / PLSC 288a, Liberty in Politics, Markets, and Society** Andrew Sabl

Key questions regarding liberty explored through critical examination of classic texts by Locke, Montesquieu, Smith, Tocqueville, and Mill. The definition, origins, and foundations of liberty; whether liberty in some realms might require the restriction of freedom in others. SO

EP&E: PoliticalSystems Core

\* **EP&E 290a / EAST 290a, Democracy, Development, and Security in the Korean Peninsula** Seok-Ju Cho

Politics and political economies in South and North Korea. Economic development, democratization, and political institutions of the two states; political and economic factors that have influenced the wide discrepancy between the two Koreas; issues in international relations, such as denuclearization, peacekeeping, and reunification. SO

**\* EP&E 291a / GLOBL 209a, Politics of Authoritarian Regimes** Staff

Introduction to the scientific study of authoritarian politics. The emergence and breakdown of authoritarian regimes; leadership changes; policy choices and institutions such regimes adopt. Analysis of public policy discourse on authoritarian politics; the potential for transition to democracy. SO

**\* EP&E 293b / EAST 357b / PLSC 390b, State and Society in Post-Mao China**

Jessica Weiss

State-society relations in the People's Republic of China. Popular protest and social mobilization, media commercialization and the Internet, and prospects for political reform and democratization. SO

**\* EP&E 294b / GLOBL 338b / PLSC 457b, Social Welfare and Nongovernmental Organizations**

Katharine Baldwin

The role of nonstate actors such as religious organizations, community associations, and international NGOs in the delivery of basic goods and services in developing countries. Welfare states in Europe and North America and reasons why states outside these regions have not developed similar institutions; causes of and logic behind various nonstate actors' involvement in social welfare provision; economic, institutional, and political effects of having nonstate actors provide social services and public goods. SO

**EP&E 295a / PLSC 344a, Game Theory and Political Science** Deborah Beim

Introduction to game theory—a method by which strategic interactions among individuals and groups in society are mathematically modeled—and its applications to political science. Concepts employed by game theorists, such as Nash equilibrium, subgame perfect equilibrium, and perfect Bayesian equilibrium. Problems of cooperation, time-consistency, signaling, and reputation formation. Political applications include candidate competition, policy making, political bargaining, and international conflict. No prerequisites other than high school algebra. Political Science majors who take this course may not count ECON 159 toward the major. QR, SO

**\* EP&E 299b / PLSC 332b, Philosophy of Science for the Study of Politics**

Ian Shapiro

An examination of the philosophy of science from the perspective of the study of politics. Particular attention to the ways in which assumptions about science influence models of political behavior, the methods adopted to study that behavior, and the relations between science and democracy. Readings include works by both classic and contemporary authors. SO

**\* EP&E 300b / ECON 452b / GLOBL 302b, Contemporary Issues in Energy Policy**

Ioannis Kessides

Overview of challenges in the global energy framework generated by concerns about energy security and climate change; public policies necessary for addressing these issues. Potential contributions and limitations of existing, improved or transitional, and advanced technologies. SO

EP&E: Advanced Seminar

[ EP&E 310, Refugee Law and Policy ]



\* **EP&E 312a / PLSC 297a, Moral Choices in Politics** Boris Kapustin

A study of how and why people make costly moral choices in politics. Figures studied include Thomas More, Abraham Lincoln, Nelson Mandela, Václav Havel, and Aung San Suu Kyi. SO

EP&E: Advanced Seminar

\* **EP&E 323b / PLSC 221b, U.S. Immigration Law and Policy** Alexandra Dufresne

Major themes and controversies in American immigration law and policy, including admission and deportation of noncitizens, protection of asylum-seekers and refugees, illegal immigration, strategies of immigration law enforcement, constitutional limits on executive power, the role of administrative agencies and federal courts, and civil rights of noncitizens before and after 9/11. Emphasis on legal reasoning and analysis. Recommended preparation: PLSC 113 and 233. SO

EP&E: Advanced Seminar

\* **EP&E 334a / PHIL 455a, Normative Ethics** Shelly Kagan

A systematic examination of normative ethics, the part of moral philosophy that attempts to articulate and defend the basic principles of morality. The course surveys and explores some of the main normative factors relevant in determining the moral status of a given act or policy (features that help make a given act right or wrong). Brief consideration of some of the main views about the foundations of normative ethics (the ultimate basis or ground for the various moral principles). Prerequisite: a course in moral philosophy. HU

EP&E: Advanced Seminar

\* **EP&E 353b / PLSC 305b, Critique of Political Violence** Boris Kapustin

Methods of conceptualizing political violence that are prevalent in contemporary political philosophical discourse. Use of theoretical-analytical tools to examine the modes violence assumes and the functions it performs in modern political life as well as the meanings and possibilities of nonviolence in politics. SO

EP&E: Advanced Seminar

\* **EP&E 380a / PLSC 313a, Bioethics, Politics, and Economics** Stephen Latham

Ethical, political, and economic aspects of a number of contemporary issues in biomedical ethics. Topics include abortion, assisted reproduction, end-of-life care, research on human subjects, and stem cell research. SO

\* **EP&E 410b / PLSC 304b, Business Ethics** Vikram Mansharamani

Current ethical problems facing business leaders. Visible and invisible factors that make ethical decisions complex and difficult to analyze. Anticipating ethical dilemmas; framing decisions and gathering information; the difficulties of taking appropriate, timely action.

EP&E: Advanced Seminar

\* **EP&E 435a / PLSC 324a, Luck and Justice** Christopher Lebron

The relations among luck, responsibility, and social justice. Questions surrounding kinds of luck, justification, rational agency, and blame. The problem of assigning responsibility for outcomes over which an individual has no direct control. SO

\* **EP&E 443b / PLSC 240b, Public Schools and Public Policy** John Starr

Exploration of policy options on controversial education issues. Case studies from both districts and states. Preference to students with training and experience in national, state, and local public policy. SO RP

EP&E: Advanced Seminar

\* **EP&E 447a / PLSC 412a, Global Journalism, National Identities** James Sleeper  
Changes in the relationship between journalism and nationalism as new technologies, capital flows, and human migrations alter public understandings of political legitimacy. The consequences of these shifts for national identity and liberal public spheres in the United States, Europe, and selected Middle Eastern and Asian nations. Implications for a global public sphere. SO

EP&E: Advanced Seminar

\* **EP&E 458b / AFAM 269b / PHIL 461b / PLSC 315b, Egalitarianism**

Christopher Lebron

The concept of equality in normative political theory explored through contemporary philosophical texts. Reasons why oppressed, marginalized, and systematically disadvantaged groups express their claims in terms of equality; racial inequality as a case study. SO

EP&E: Advanced Seminar

\* **EP&E 466a / PLSC 202a, Children's Law and Policy** Alexandra Dufresne

Major themes and controversies in children's law and policy in the United States. Topics include juvenile justice, child abuse and neglect, special education, and the rights of immigrant and refugee children. Development of skills in legal reasoning, analysis, and policy design. Priority to junior and senior majors in Ethics, Politics, and Economics and in Political Science. SO

EP&E: Advanced Seminar

\* **EP&E 469b / PLSC 336b, Toleration in Theory and Practice** Andrew Sabl

Toleration as a political practice that allows people with fundamentally different beliefs to live together; necessary limits, real or alleged, of that practice. Perspectives from the fields of history and political science and from moral, political, and legal theory. Origins and varieties of toleration; case studies in the United States and abroad, including hate speech, Amish exemptions from general laws, Islam and secularism, and national security as a basis for limits on religious freedom. SO

EP&E: Advanced Seminar

\* **EP&E 471a or b, Directed Reading and Research** Staff

For individual reading and research unrelated to the senior essay. Students must obtain the signature of the faculty member supervising their independent work on an Independent Study Form (available from the Ethics, Politics, and Economics registrar's office). This form must be submitted to the director of undergraduate studies at the time the student's class schedule is submitted.

\* **EP&E 472a / PLSC 349a, Ethnic Conflict** Nicholas Sambanis

Study of ethnic conflict, focusing on violent forms such as civil wars. Dominant explanations of ethnic conflict; historical case material, policy reports, and news articles from Bosnia, Rwanda, Iraq, Afghanistan, and Syria; analysis of data on ethnic conflict that spans more than fifty years; research from the fields of political science, economics, sociology, and anthropology. Recommended preparation: introductory courses in political science and economics. SO

**\* EP&E 480a / PHIL 465a, Recent Work in Ethical Theory** Stephen Darwall

A study of recently published works on ethics and its foundations. Issues include the grounds of normativity and rightness and the role of the virtues. HU

**\* EP&E 481a or b / PLSC 442a or b / SAST 341a or b, Development in South Asia**  
Staff

Introduction to issues surrounding political and economic development in South Asia. Successes and failures of modernization, including the influence of intellectual trends and their derivative policy prescriptions. Foundational perspectives on development and the policies they yielded; empirical treatments of the experiences of South Asian countries in the postcolonial era. SO

**\* EP&E 491a or b, The Senior Essay** Staff

A one-term senior essay. The essay should fall within the student's area of concentration. If no appropriate seminar is offered in which the essay might be written, the student, in consultation with the director of undergraduate studies, should choose an appropriate member of the faculty to supervise the senior essay. Students must obtain the signature of the faculty member supervising their independent work on an Independent Study Form (available from the Ethics, Politics, and Economics registrar's office). This form must be submitted to the director of undergraduate studies at the time the student's class schedule is submitted.

**\* EP&E 492a and EP&E 493b, The Yearlong Senior Essay** Staff

A two-term senior essay. The essay should fall within the student's area of concentration. The student, in consultation with the director of undergraduate studies, should choose an appropriate member of the faculty to supervise the senior essay. Students must obtain the signature of the faculty member supervising their independent work on an Independent Study Form (available from the Ethics, Politics, and Economics registrar's office). This form must be submitted to the director of undergraduate studies at the time the student's class schedule is submitted.

**OTHER COURSES RELATED TO ETHICS, POLITICS, AND ECONOMICS****PHIL 175a, Introduction to Ethics** Shelly Kagan

What makes one act right and another wrong? What am I morally required to do for others? What is the basis of morality? These are some of the questions raised in moral philosophy. Examination of two of the most important answers, the theories of Mill and Kant, with brief consideration of the views of Hume and Hobbes. Discussion of the question: Why be moral? HU

EP&E: Intro Ethics

**PLSC 114b, Introduction to Political Philosophy** Bryan Garsten

Fundamental issues in contemporary politics investigated through reflection on classic texts in the history of political thought. Emphasis on topics linked to modern constitutional democracies, including executive power, representation, and political parties. Readings from Plato, Machiavelli, Hobbes, Locke, Rousseau, Madison and Hamilton, Lincoln, and Tocqueville, in addition to recent articles on contemporary issues. SO

EP&E: Intro Political Phil

**PLSC 118a, The Moral Foundations of Politics** Ian Shapiro

An introduction to contemporary discussions about the foundations of political argument. Emphasis on the relations between political theory and policy debate (e.g.,

social welfare provision and affirmative action). Readings from Bentham, Mill, Marx, Burke, Rawls, Nozick, and others. SO  
EP&E: Intro Political Phil

## Ethnicity, Race, and Migration

Director of undergraduate studies: Alicia Schmidt Camacho, Rm. 204, 35 Broadway, 432-5116, erm@yale.edu; erm.yale.edu

### FACULTY ASSOCIATED WITH THE PROGRAM OF ETHNICITY, RACE, AND MIGRATION

**Professors** Ned Blackhawk (*History, American Studies*), Hazel Carby (*African American Studies, American Studies*), Michael Denning (*American Studies, English*), John Mack Faragher (*History, American Studies*), Inderpal Grewal (*American Studies, Women's, Gender, & Sexuality Studies*), Dolores Hayden (*Architecture, American Studies*), Jonathan Holloway (*History, African American Studies*), Matthew Jacobson (*American Studies, African American Studies, History*), Gilbert Joseph (*History*), Kenneth Kidd (*School of Medicine*), Benedict Kiernan (*History*), Jennifer Klein (*History*), Mary Lui (*American Studies, History*), Stephen Pitti (*History, American Studies*), Alicia Schmidt Camacho (*American Studies*), Jing Tsu (*East Asian Languages & Literatures*), Michael Veal (*Music*), Laura Wexler (*American Studies, Women's, Gender, & Sexuality Studies*)

**Associate Professors** Jafari Allen (*Anthropology, African American Studies*), Zareena Grewal (*American Studies*)

**Assistant Professors** Rene Almeling (*Sociology*), Laura Barraclough (*American Studies*), Albert Laguna (*American Studies, Ethnicity, Race, & Migration*), Vida Maralani (*Sociology*), Justin Neuman (*English*), Dixia Ramirez (*American Studies, Ethnicity, Race, & Migration*), Birgit Brander Rasmussen (*American Studies*)

**Senior Lecturers** Oluseye Adesola (*African Studies*), Geetanjali Singh Chanda (*Women's, Gender, & Sexuality Studies*)

**Lecturers** Jasmina Besirevic-Regan (*Sociology*), Alexandra Dufresne (*Political Science*), David Simon (*Political Science*)

The program in Ethnicity, Race, and Migration enables students to engage in an interdisciplinary, comparative study of forces that have created a multicultural, multiethnic, and multiracial world. The major emphasizes familiarity with the intellectual traditions and debates surrounding the concepts of indigeneity, ethnicity, nationality, and race; grounding in both the history of migration and its contemporary manifestations; and knowledge of and direct engagement with the cultures, structures, and peoples formed by these migrations.

Prospective majors should consult the director of undergraduate studies early in their academic careers to discuss an individual plan of study. Enrollment in the major requires permission of the director of undergraduate studies prior to the beginning of the fall term of the junior year.

**Requirements of the major** Students must complete twelve term courses in Ethnicity, Race, and Migration, including the senior requirement. These twelve must include ER&M 200, an introductory course on the issues and disciplines involved in the study

of ethnicity, race, and migration. Students interested in the major should take this course early in their studies, preferably during the freshman or sophomore year in preparation for more advanced work in the junior seminar. In the junior year, all majors are required to take ER&M 300, a seminar that introduces majors to scholarship in ethnic studies, postcolonial studies, and cultural studies.

**Distributional requirements** In order to acquire a comparative sense of ethnicity, race, and migration, students are expected to take at least two courses in each of two distinct geographic areas. To gain familiarity with global movements of people within and across national borders, majors must take at least one course that examines historical or contemporary migrations. Students must also demonstrate evidence of interdisciplinary work related to ethnicity, race, and migration in at least two departments or academic fields.

**Area of concentration** In consultation with the director of undergraduate studies, each student defines an area of concentration consisting of five term courses, not including the senior essay or project. Advanced work in the foreign language related to a student's area of concentration is advised. Courses applied toward the area of concentration may also be used to fulfill the major's distributional requirements.

As a multidisciplinary program, Ethnicity, Race, and Migration draws on the resources of other departments and programs in the University. Students are encouraged to examine the offerings of other departments in both the humanities and the social sciences, interdisciplinary programs of study housed in the MacMillan Center and elsewhere, and residential college seminars for additional relevant courses. The stated area of concentration of each student determines the relevance and acceptability of other courses. Students are also encouraged to engage in community-based learning opportunities.

**Senior requirement** The senior requirement has two components. In the fall term, all majors take the senior colloquium (ER&M 491) on theoretical and methodological issues. Students may choose to complete the requirement by writing a senior essay in the senior project seminar (ER&M 492) during the spring term. Alternatively, students may take an upper-level ER&M seminar and write a senior essay of thirty to thirty-five pages in addition to completing all course requirements. This seminar may be taken during either the fall or spring term. Majors planning to undertake an independent senior project must submit a proposal signed and approved by a faculty adviser to the director of undergraduate studies during the fall term.

**Term abroad** Because of the major's emphasis on international and transnational work, students are encouraged to undertake a term abroad. They should consult with the director of undergraduate studies to identify courses from study abroad programs that may count toward the major.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 term courses (incl senior req)

**Specific courses required** ER&M 200, 300

**Distribution of courses** 5 courses in area of concentration; at least 2 courses in each of 2 geographic areas; at least 1 course on historical or contemporary migrations; at least 2 interdisciplinary courses from different departments or fields

**Senior requirement** Senior colloq (ER&M 491); senior essay or project in upper-level sem or in ER&M 492

## Required Courses

**ER&M 200a, Introduction to Ethnicity, Race, and Migration** Alicia Camacho  
Historical roots of contemporary ethnic and racial formations and competing theories of ethnicity, race, and migration. Cultural constructions and social practices of race, ethnicity, and migration in the United States and around the world. HU, SO

\* **ER&M 300b, Comparative Ethnic Studies** Stephen Pitti  
Introduction to the methods and practice of comparative ethnic studies. Examination of racial formation in the United States within a transnational framework. Legacies of colonialism, slavery, and racial exclusion; racial formation in schools, prisons, and citizenship law; cultural politics of music and performance; social movements; and postcolonial critique. SO

## Electives within the Major

\* **AFAM 060a / AMST 060a / HIST 016a, Significance of American Slavery**  
Edward Rugemer

The history of American slavery, its destruction during the nineteenth century, and its significance today. Topics include the origins of slavery, the development of racism, the transatlantic slave trade, the experience of enslavement, resistance to slavery, the abolitionist movement, the process of emancipation, and the perpetuation of slavery and other forms of unfree labor in the twenty-first century. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

**AFAM 194b / AMST 194b / ENGL 194b, African American Arts Today**  
Elizabeth Alexander

The renaissance in African American culture from 1980 to the present. Great works of poetry, fiction, creative nonfiction, drama, film, music, dance, painting, photography, and hip-hop by living African American artists. Critical vocabularies and approaches with which to think about questions of genre; writing knowledgeably and persuasively about art across multiple genres and in historical context. Artists include Anna Deavere Smith, Suzan-Lori Parks, Toni Morrison, Edwidge Danticat, Colson Whitehead, Hilton Als, Rita Dove, Terrance Hayes, Bill T. Jones, Kerry James Marshall, Lorna Simpson, Jason Moran, and Jay-Z. Lectures feature public conversations with several of the artists studied. HU

\* **AFAM 349b / AMST 326b / WGSS 388b, Civil Rights and Women's Liberation**  
Crystal Feimster

The dynamic relationship between the civil rights movement and the women's liberation movement from 1940 to the present. When and how the two movements overlapped, intersected, and diverged. The variety of ways in which African Americans and women campaigned for equal rights. Topics include World War II, freedom summer, black power, the Equal Rights Amendment, feminism, abortion, affirmative action, and gay rights. HU

\* **AFAM 383b / AFST 476b / FREN 376b, The Two Congos: Literature and Culture in the Heart of Africa** Christopher Miller

An interdisciplinary approach to two nations that share a name, a river, and elements of culture but that are divided by colonial heritage (one Belgian, one French). Emphasis on literature, with references to history, film, anthropology, art, politics, music, and sports. Views from outside the two countries (*Heart of Darkness*, *Tintin*, V.S. Naipaul) and inside (H. Lopes, V. Y. Mudimbe, A. Mabanckou, S. Mukasonga). The 1974 Ali-Foreman "Rumble in the Jungle" boxing match; Rwandan genocide in film and literature. Reading knowledge of French required. HU

\* **AFAM 408a / AMST 460a / ENGL 443a, African American Poets of the Modern Era** Robert Stepto

The African American practice of poetry between 1900 and 1960, especially of sonnets, ballads, sermonic, and blues poems. Poets include Paul Laurence Dunbar, Langston Hughes, Sterling Brown, Gwendolyn Brooks, Margaret Walker, and Robert Hayden. Class sessions at the Beinecke Library for inspection and discussion of original editions, manuscripts, letters, and other archival material. HU

\* **AMST 307b, Sports, Civil Rights, and American Leadership** Joseph Spooner

Relations among sports, civil rights movements, and the evolution of American leadership values in the twentieth century. The American sports hero and the struggle for equality of race, gender, and sexual orientation; the cultural effects of major sports phenomena on ideas of leadership and social change. Attention to intellectual and cultural history, literature, and film. Case studies based on key sporting figures and events.

\* **AMST 348a, Space, Place, and Landscape** Laura Barraclough

Survey of core concepts in cultural geography and spatial theory. Ways in which the organization, use, and representation of physical spaces produce power dynamics related to colonialism, race, gender, class, and migrant status. Multiple meanings of home; the politics of place names; effects of tourism; the aesthetics and politics of map making; spatial strategies of conquest. Includes field projects in New Haven. SO

\* **AMST 483a, Urban Public Spaces** Laura Barraclough

The production, representation, use, and transformation of urban public spaces, with a focus on the contemporary United States. Relations to evolving practices of citizenship, the workings of democracy, and dynamics of power. Meanings of public space for community and everyday life; power and resistance; art, theater, and performance; the work of community organizations. Includes field projects in New Haven. SO

**ANTH 237a, Smuggling, Trafficking, and the Criminal Act** Narges Erami

Theories and ethnographies of marginal, hidden, secret, and invisible economies. How governments deal with illicit and criminal behavior that trespasses national boundaries. Focus on transnational smuggling rings for which the difference between legal and illegal commercial activities is blurred. Additional topics include human trafficking, prostitution, counterfeiting, drugs, and pirated music. SO  
Anthropology: Sociocultural

**ANTH 254a, Japan: Culture, Society, Modernity** William Kelly

Introduction to Japanese society and culture. The historical development of Japanese society; family, work, and education in contemporary Japan; Japanese aesthetics; and psychological, sociological, and cultural interpretations of Japanese behavior. WR, SO

Anthropology: Sociocultural

\* **ANTH 366a / AMST 435a, Anthropology of Inequality in America** Chloe Taft  
Sociocultural dimensions of social inequality in the contemporary United States. Ways in which the socioeconomic processes that produce inequality are inextricably embedded in worlds of cultural meaning; how those meanings are constructed and embodied in everyday practice. Perspectives from anthropology, sociology, economics, history, and popular media. SO  
Anthropology: Sociocultural

\* **ANTH 386a, Humanitarian Interventions: Ethics, Politics, and Health**  
Catherine Panter-Brick

Analysis of humanitarian interventions from a variety of social science disciplinary perspectives. Issues related to policy, legal protection, health care, morality, and governance in relation to the moral imperative to save lives in conditions of extreme adversity. Promotion of dialogue between social scientists and humanitarian practitioners. SO

Anthropology: Sociocultural

\* **ANTH 438b, Culture, Power, Oil** Douglas Rogers

The production, circulation, and consumption of petroleum as they relate to globalization, empire, cultural performance, natural resource extraction, and the nature of the state. Case studies include the United States, Saudi Arabia, Nigeria, Venezuela, and the former Soviet Union. SO

Anthropology: Sociocultural

\* **ENGL 335a / AFAM 338a / LITR 280a, Caribbean Poetry** Anthony Reed

Survey of major twentieth-century Caribbean poets such as Derek Walcott, Kamau Brathwaite, and Aimé Césaire. WR, HU  
English: Junior Seminar

\* **EP&E 246a / AFST 420a / LAST 406a / PLSC 430a, The Politics of Development Assistance** David Simon

Study of development assistance, a dominant feature of the political economies of some of the world's poorest countries. The motivations and politics of aid from donors' perspectives; the political and economic impact of aid on developing countries. Proposals to make aid a more effective instrument of development. SO

EP&E: PoliticalSystems Core

\* **EP&E 323b / PLSC 221b, U.S. Immigration Law and Policy** Alexandra Dufresne  
Major themes and controversies in American immigration law and policy, including admission and deportation of noncitizens, protection of asylum-seekers and refugees, illegal immigration, strategies of immigration law enforcement, constitutional limits on executive power, the role of administrative agencies and federal courts, and civil rights of noncitizens before and after 9/11. Emphasis on legal reasoning and analysis. Recommended preparation: PLSC 113 and 233. SO

EP&E: Advanced Seminar

\* **ER&M 017a / AMST 017a / HUMS 077a, Travel Literature of the Americas**

Dixa Ramirez

Evolving visions of the so-called New World from 1492 to the present. Readings from fictional and nonfictional accounts of travel to or throughout the Americas. Visual examples of travel narratives, including tourism ads; some attention to scholarly



criticism. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **ER&M 129a / HIST 129Ja, Topics in California History** Genevieve Carpio  
Twentieth-century California history, with an emphasis on Latino/a history. Themes include car culture, ethnic quarantines, tourism, and immigration enforcement at the U.S.-Mexico border. Use of traditional historical methods and new media. WR, HU

**ER&M 210b / AFAM 140b / AMST 211b / ENGL 293b / WGSS 211b, Race and Gender in American Literature** Birgit Rasmussen

The role of literature in constructing representations of America as an idea, a nation, a colonial settlement, and a participant in world affairs. What kind of place America is and who belongs there; the consequences of America's history for its national literature. Emphasis on the ways texts represent and contest social concepts of race and gender difference. WR, HU

**ER&M 219a / HIST 219a / JDST 200a / MMES 149a / RLST 148a, History of the Jews and Their Diasporas to Early Modern Times** Ivan Marcus

A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings. Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP

**ER&M 236a / ENGL 344a / EP&E 265a, Global Fictions** Justin Neuman

Narrative literature from the late nineteenth century to the present that explores and reflects the dialectics of globalization. Vectors of globalization examined include energy systems, commodity capitalism, war, and sexuality. Works by Verne, Kafka, Forster, Duras, Bolaño, and others. WR, HU

**ER&M 264a / SOCY 134a / WGSS 110a, Sex and Gender in Society** Rene Almeling

Introduction to the social processes through which people are categorized in terms of sex and gender, and how these social processes shape individual experiences of the world. Sex and gender in relation to race/ethnicity, class, sexuality, nationality, education, work, family, reproduction, and health. SO

\* **ER&M 271b / AFST 447b / EP&E 271b / PLSC 447b, The Rwandan Genocide in Comparative Context** David Simon

An examination of the 1994 Rwandan genocide: historical sources of the conflict, the motivations of the killers, actions and reactions of outside actors, efforts to reconstruct a post-genocide society, and continuation of the genocidal dynamic within the Great Lakes region. Consideration of other countries in similar situations, as well as other genocides in recent decades. SO

**ER&M 278b / AFAM 178b / AFST 188b / HSAR 378b, From West Africa to the Black Americas: The Black Atlantic Visual Tradition** Robert Thompson

Art, music, and dance in the history of key classical civilizations south of the Sahara—Mali, Asante, Dahomey, Yorùbá, Ejagham, Kongo—and their impact on New World art and music, especially rock, blues, North American black painting of the past ten years, and black artists of Cuba, Haiti, and Brazil. HU

\* **ER&M 280a / GMAN 380a / MUSI 380a, Music in Nazi Germany**

Gundula Kreuzer

The interrelations between music and politics under the extreme conditions of a totalitarian regime. How the National Socialists sought to police all aspects of Germany's musical life between 1933 and 1945 and why they often failed. Topics include aesthetic, political, and administrative prerequisites for the Nazis' efforts; consequences of Nazism for musical culture during the Third Reich and beyond; and the vulnerability of music to ideological appropriation.

\* **ER&M 312b / AMST 315b, Colonial Visions and Contemporary Revisions**

Birgit Rasmussen

American literature from the colonial period paired with contemporary texts to examine how contemporary writers use, critique, revise, or speak back to colonial narratives. Contemporary authors include Eduardo Galeano, Toni Morrison, and Arthur Miller, who revisit histories of conquest, enslavement, and settler colonialism. HU RP

**ER&M 313b / AFST 180b, Nigeria and Its Diaspora** Oluseye Adesola

Nigerians in the modern diaspora, both those who endured forced migration and those who migrated voluntarily. Specific reference to the Igbos and the Yorùbás. The preservation and maintenance of Nigerian culture, history, dance, literature, traditional education, theater, politics, art, music, film, religion, and folklore, especially in African American and Nigerian American contexts. SO

\* **ER&M 314a / AFAM 324a / AMST 337a, Urban Latina/o Cultures** Dixia Ramirez

Latina/o urbanism as expressed in literature and culture. Focus on the twentieth and twenty-first centuries, with background on the formation of Latina/o communities in the nineteenth century. Sources include film and the visual arts. HU

\* **ER&M 315b / AFAM 336b / AMST 336b, Haitian and Dominican Literature and Culture** Dixia Ramirez

The literature and culture of Haiti, the Dominican Republic, and their diasporas in the United States and Canada since 1804. Focus on texts that explore relations between the two nations, with some attention to each country's individual literary and cultural traditions. Conventional literary texts such as novels and poetry, as well as political documents, orally transmitted texts, and imagery. HU

**ER&M 317a / PLSC 124a, The Politics of Migration** Margaret Peters

The politics of migration in both receiving and sending states during the past two hundred years. Focus on current debates over immigration in the United States. Topics include public opinion, interest group politics, the role of institutions, policy formation, and human rights. SO

\* **ER&M 323b / AMST 322b / WGSS 371b, Modern Families, Identities, and Cultures in Asia and the United States** Geetanjali Chanda

A cross-cultural dialogue focusing on family, gender, and identity. Exploration of how specific Asian countries and people approach issues of religion, dress, education, and food as identity markers; U.S. perceptions and reactions to similar issues. WR, HU

\* **ER&M 327a / MMES 311a / WGSS 327a, Constructing the Self: From Autobiography to Facebook** Geetanjali Chanda

Autobiography in its evolving form as literary genre, historical archive, and individual and community narrative in a changing geographical context. Women's life stories from Afghanistan, China, Cambodia, Indonesia, India, Iran, Egypt, Jordan, and

Vietnam illustrate the dialectic relationship between the global and the local. What the reading and writing of autobiographies reveal about oneself and one's place in society; autobiography as a horizontal community formation. WR, HU

\* **ER&M 328a / SAST 458a / WGSS 328a, Popular Culture and Postcolonial India**  
Geetanjali Chanda

A study of films and literature of South Asians living, working, and directing in Canada, the United Kingdom, and the United States. Questions of commercial populism, authenticity, and postcolonial identity. WR

**ER&M 341a / HIST 358a / LAST 150a, History of Mexico since Independence**  
Gilbert Joseph

Modern Mexico from the wars of independence in the early nineteenth century to the present. Social, cultural, and economic trends and their relationship to political movements; particular emphasis on the Revolution of 1910 and the long shadow it has cast, and on patterns of relations with the United States. HU

\* **ER&M 342a / HIST 372Ja / LAST 372a, Revolutionary Change and Cold War in Latin America** Gilbert Joseph

Analysis of revolutionary movements in Latin America against the backdrop of the Cold War. Critical examination of popular images and orthodox interpretations. An interdisciplinary study of the process of revolutionary change and cold war at the grassroots level. WR, HU

\* **ER&M 362a / GLBL 384a / SOCY 363a, Genocide and Ethnic Conflict**  
Jasmina Besirevic Regan

Exploration of the explosion of genocide and violent ethnic conflict in the past seventy years, including contributory historical and political elements. Consideration of ways to prevent or resolve such conflicts. Focus on questions of identity, religion, class, and nationhood as related to violence and conflict. An analytical framework developed from four case studies: the Holocaust, Cambodia, the former Yugoslavia, and Rwanda. SO

\* **ER&M 370b, Indians and the Spanish Borderlands** Staff

The experiences of Native Americans during centuries of relations with North America's first imperial power, Spain. The history and long-term legacies of Spanish colonialism from Florida to California. WR, HU

\* **ER&M 384b / AMST 383b, U.S. Border and Immigration Policy** Laura Barraclough  
U.S. border and immigration policies at the national, state, and local levels from the colonial period to the present. The historical evolution of border and immigration policy; contemporary debates; the effects of shifting policy on immigrants of varying legal statuses. SO RP

\* **ER&M 413a / AFAM 411a / AMST 426a / WGSS 411a, Fictions of Imaginary and Imminent Futures** Hazel Carby

Ways in which creative artists can imagine and reimagine definitions of the human, through hybridity, crossing the boundaries of species being, contesting ideas of racialized bodies, expanding the possibilities of genders and sexualities, and questioning the relationship between biology, technology, and the body. Focus on an international range of literature, novels, and short stories in the genre of science and speculative fiction, as well as various forms of futurism in visual and sonic culture. HU

**\* ER&M 415a / AMST 467a, Investigating the Present** Alicia Camacho

An interdisciplinary approach to the processes of social documentation, as practiced in the fields of cultural and ethnic studies. The challenges of representing ongoing social processes with authority and integrity; writing as a social act; methods for developing a contemporary archive. Readings from the works of authors whose narratives cross the boundary between scholarship and literature. HU

**\* ER&M 419a / SOCY 319a, Ethnography of the African American Community**

Elijah Anderson

An ethnographic study of the African American community. Analysis of ethnographic and historical literature, with attention to substantive, conceptual, and methodological issues. Topics include the significance of slavery, the racial ghetto, structural poverty, the middle class, the color line, racial etiquette, and social identity. SO

**HIST 119b / AFAM 172b, The Civil War and Reconstruction Era, 1845–1877**

David Blight

The causes, course, and consequences of the American Civil War. A search for the multiple meanings of a transformative event, including national, sectional, racial, constitutional, social, gender, intellectual, and individual dimensions. HU

**HIST 264b, Eastern Europe since 1914** Timothy Snyder

Eastern Europe from the collapse of the old imperial order to the enlargement of the European Union. Main themes include world war, nationalism, fascism, and communism. Special attention to the structural weaknesses of interwar nation-states and postwar communist regimes. Nazi and Soviet occupation as an age of extremes. The collapse of communism. Communism after 1989 and the dissolution of Yugoslavia in the 1990s as parallel European trajectories. HU

**HIST 303b, Japan's Modern Revolution** Daniel Botsman

A survey of Japan's transformation over the course of the nineteenth century from an isolated, traditional society on the edge of northeast Asia to a modern imperial power. Aspects of political, social, and cultural history. HU

**HIST 310a / SAST 221a, History of Modern South Asia** Julia Stephens

Survey of the Indian subcontinent's history from colonial rule, through nationalist resistance, to postcolonial history. The establishment of British dominion; colonial transformation of Indian politics, society, economy, and culture; nationalism before and after Gandhi; the partition of India; and recent developments in South Asia. HU

**HIST 323b, Southeast Asia since 1900** Benedict Kiernan

Comparative colonialism, nationalism, revolution, and independence in modern Southeast Asia. Topics include Indonesia and the Dutch, Indochina under French rule, the United States in the Philippines and Vietnam, Buddhism in Burma and Thailand, communist and peasant movements, and the Cambodian revolution and its regional repercussions. HU

**HIST 332a, African Encounters with Colonialism** Daniel Magaziner

How African societies and peoples encountered, engaged, and endured the colonial and postcolonial world, from the arrival of Kiswahili-speaking traders at the shores of Lake Victoria in the 1840s through the rise and fall of European colonialism and the resulting forms of neocolonialism. Transformations and continuities in African religious life; gendered sociability; popular culture. HU

**HIST 335b / AFST 335b, A History of South Africa** Daniel Magaziner

An introduction to the history of southern Africa, especially South Africa. Indigenous communities; early colonial contact; the legacies of colonial rule; postcolonial mismanagement; the vagaries of the environment; the mineral revolution; segregationist regimes; persistent inequality and crime since the end of apartheid; the specter of AIDS; postcolonial challenges in Zimbabwe, Angola, and Mozambique.

HU

**\* HIST 362Ja, Cold War in the Third World** Jeremy Friedman

The collapse of colonial empires and the emergence of Asia, Africa, and Latin America during the Cold War. Attempts to develop political and economic systems while negotiating factors such as revolution, socialism, religion, and geopolitics. Conceptual discourses within and without the developing world surrounding issues such as independence, nationalism, racial identity, violence, social and political order, and economic justice and growth. WR

**HIST 363b / LAST 364b, Latin America since Independence**

Marcela Echeverri Munoz

An introduction to Latin American history and its global implications, from nineteenth-century independence processes and creation of the region's nations to the twenty-first century. Focus on ways in which the flow of ideas, technology, and people has transformed Latin American politics. Topics include nationalism, race, ethnicity, revolution, development, and democracy. WR, HU

**\* HIST 377Ja / LAST 377a, Freedom and Abolition in Latin America**

Marcela Echeverri Munoz

The history of freedom in Latin America, with a focus on issues surrounding slavery and abolition. The rise of slavery and slave societies across the region, including context within the founding of European empires in the Americas. Ways in which the lives of freed slaves in Latin America represented a practical freedom that preceded the emergence of Enlightenment abolitionism in the nineteenth century. Relations between black politics, revolution, liberalism, and opposition to slavery. WR, HU

History: Preindustrial

**\* HIST 388Ja / AFST 486a, Slavery and the Slave Trade in Africa** Robert Harms

The slave trade from the African perspective. Analysis of why slavery developed in Africa and how it operated. The long-term social, political, and economic effects of the Atlantic slave trade. WR, HU

History: Preindustrial

**HSAR 373b / AFAM 215b, African American Art, 1963 to the Present** Erica James

Modern African American artistic production explored in the context of American art and social history. Critical race theory and artistic discourse from the Spiral group in 1963, to the Black Arts Movement and the culture wars, to current readings in American and postblack art. The complicated relations between African American art and politics. Use of art objects from the Yale University Art Gallery. HU

**LITR 143b / FILM 240b, World Cinema** Dudley Andrew

Development of ways to engage films from around the globe productively. Close analysis of a dozen complex films, with historical contextualization of their production and cultural functions. Attention to the development of critical skills. Includes weekly screenings, each followed immediately by discussion. WR, HU

**LITR 338a / FILM 362a / FREN 384a / ITAL 384a / JDST 289a, Representing the Holocaust** Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Life Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

\* **LITR 417a / THST 426a, Maps and the Western Literary Imagination**  
Ayesha Ramachandran

The influence of mapping and changing notions of space on literary form, from the cartographic revolution of the sixteenth century to the modern spatial-digital revolution of GPS mapping. Spatial literacy in verbal and visual texts; maps in books and as books; literary uses of mapping practices; recent literary theory on the spatial turn. Works by More, Camões, Montaigne, Voltaire, Pynchon, Walcott, and Chamoiseau. Use of the map collections in Yale's Sterling Memorial and Beinecke libraries. HU

\* **PLSC 225a, Policing in America** Dean Esserman

Examination of major innovations in policing over the past three decades. The effects of these changes on crime control and public safety; the extent to which new approaches have been implemented in police departments; dilemmas these approaches have created for police management. Analysis of critical issues that persist in the profession, including race, the use of force, and police deviance. SO

\* **PLSC 240b / EP&E 443b, Public Schools and Public Policy** John Starr

Exploration of policy options on controversial education issues. Case studies from both districts and states. Preference to students with training and experience in national, state, and local public policy. SO RP

\* **PLSC 245a / AFAM 268a, Urban Politics and Policy** Cynthia Horan

Approaches to urban politics and political economy. Application of theories to contemporary policy issues such as policing, metropolitan disparities, and inner-city revitalization. SO

\* **PLSC 260a, Public Schools and Politics** John Starr

Investigation of how political decisions that affect public schools are made at local, state, and federal levels. Case studies from both districts and states. Preference to students with training and experience in national, state, and local politics. SO RP

\* **PLSC 280b / AFAM 270b, Poverty, Politics, and Policy in the American City**  
Cynthia Horan

Examination of how politics informs the formulation and implementation of policies to address urban poverty. Consideration of alternative explanations for poverty and alternative government strategies. Focus on efforts by local organizations and communities to improve their situations within the context of government actions. SO

**PLSC 359b / GLBL 269b, Violence and Civil Strife** Stathis Kalyvas

An examination of political violence with an emphasis on civil wars, presently the dominant form of war. SO

\* **PLSC 368b, Global Politics** Stathis Kalyvas

Major issues in current international politics, from political economy to international security, with a broad geographic focus. Emphasis on analytic and synthetic skills. Themes include the politics of economic crisis, global governance, state failure, and political and economic development. SO

\* **PLSC 436a / GLBL 361a, Violence: State and Society** Matthew Kocher

Examination of large-scale violence, generally within sovereign states. Why violence happens, why it takes place in some locations and not others, why it takes specific forms (insurgency, terrorism, civilian victimization), what explains its magnitude (the number of victims), and what explains targeting (the type or identity of victims). SO

\* **PORT 394a / LAST 394a / LITR 294a, World Cities and Narratives**

K. David Jackson

Study of world cities and selected narratives that describe, belong to, or represent them. Topics range from the rise of the urban novel in European capitals to the postcolonial fictional worlds of major Portuguese, Brazilian, and Spanish American cities. Conducted in English. WR, HU TR

\* **SOCY 232b / AFST 348b / MMES 291b, Islamic Social Movements**

Jonathan Wyrzten

Social movement and network theory used to analyze the emergence and evolution of Islamic movements from the early twentieth century to the present. Organization, mobilization, and framing of political, nonpolitical, militant, and nonmilitant movements; transnational dimensions of Islamic activism. Case studies include the Muslim Brotherhood, Hamas, Hizbollah, Al-Qaeda, Al-Adl wa-Ihsann, and Tablighi Jama'at. SO

\* **SOCY 314b / AFAM 273b / WGSS 316b, Inequality in America** Vida Maralani

Empirical, theoretical, and methodological issues involved in the study of inequalities in occupation, income, wealth, education, health, and neighborhoods. Intergenerational mobility, marriage and family processes, and inequalities of race, ethnicity, and gender. Questions include whether the United States is a land of opportunity and how different social groups fare and why. WR, SO

\* **SOCY 339b / AFST 373b / GLBL 362b / MMES 282b, Imperialism, Insurgency, and State Building in the Middle East and North Africa** Jonathan Wyrzten

The historical evolution of political order from Morocco to Central Asia in the past two centuries. Focus on relationships between imperialism, insurgency, and state building. Ottoman, European, and nationalist strategies for state building; modes of local resistance; recent transnational developments; American counterinsurgency and nation-building initiatives in the region. SO

## Individual Research and Senior Essay Courses

\* **ER&M 471a and ER&M 472b, Individual Reading and Research for Juniors and Seniors** Alicia Camacho

For students who wish to cover material not otherwise offered by the program. The course may be used for research or for directed reading. In either case a term paper or its equivalent is required. Students meet regularly with a faculty adviser. To apply for admission, students submit a prospectus signed by the faculty adviser to the director of undergraduate studies.

**\* ER&M 491a, The Senior Colloquium: Theoretical and Methodological Issues**

Stephen Pitti

A research seminar intended to move students toward the successful completion of their senior projects, combining discussions of methodological and theoretical issues with discussions of students' fields of research.

**\* ER&M 492b, The Senior Essay or Project** Alicia Camacho

Independent research on a one-term senior essay or project.

## Film Studies

Director of undergraduate studies: J. D. Connor, 559 LORIA, 432-8225,  
jd.connor@yale.edu; filmstudies.yale.edu

### FACULTY ASSOCIATED WITH THE PROGRAM OF FILM STUDIES

**Professors** \*Dudley Andrew (*Comparative Literature, Film Studies*), Hazel Carby (*African American Studies, American Studies*), \*Francesco Casetti (*Humanities, Film Studies*), \*Katerina Clark (*Comparative Literature, Slavic Languages & Literatures*), Michael Denning (*American Studies, English*), \*John Mack Faragher (*History*), \*Aaron Gerow (*East Asian Languages & Literatures, Film Studies*), Inderpal Grewal (*Women's, Gender, & Sexuality Studies*), Benjamin Harshav (*Comparative Literature*), Stathis Kalyvas (*Political Science*), \*Thomas Kavanagh (*French*), \*John MacKay (*Chair*) (*Film Studies, Slavic Languages & Literatures*), \*Millicent Marcus (*Italian*), Donald Margulies (*Adjunct*) (*English, Theater Studies*), Giuseppe Mazzotta (*Italian*), Kobena Mercer (*History of Art, African American Studies*), Christopher L. Miller (*African American Studies, French*), \*Charles Musser (*American Studies, Film Studies*), \*Brigitte Peucker (*German, Film Studies*), Joseph Roach (*English, Theater Studies*), \*Michael Roemer (*Adjunct*) (*Art, American Studies*), Alan Trachtenberg (*Emeritus*), \*Katie Trumpener (*Comparative Literature, English*), \*Laura Wexler (*American Studies, Women's, Gender, & Sexuality Studies*)

**Associate Professors** \*Murray Biggs (*Adjunct*) (*Theater Studies, English*), Moira Fradinger (*Comparative Literature*), Karen Nakamura (*Anthropology*), Brian Walsh (*English*)

**Assistant Professors** \*J. D. Connor (*History of Art*), Zareena Grewal (*Ethnicity, Race, & Migration*), R. John Williams (*English*)

**Senior Lecturers** \*John Crowley (*English*), \*Ron Gregg (*Film Studies*)

**Lecturers** \*Jonathan Andrews (*Art, Film Studies*), James Charney (*School of Medicine*), \*Michael Kerbel (*American Studies*), \*Marc Lapadula (*Film Studies*)

**Critic** \*Sandra Luckow (*Art*)

**Senior Lecturer II** Seungja Choi (*East Asian Languages & Literatures*)

**Senior Lectors** Krystyna Illakowicz (*Slavic Languages & Literatures*), Karen von Kunes (*Slavic Languages & Literatures*)

\*Member of the Film Studies Committee.

The major in Film Studies focuses on the history, theory, criticism, and artistic creation of cinema and other moving-image media. Courses examine cinema's role as a unique



modern art form and the contributions of moving-image media as cultural practices of enduring social significance. As an interdisciplinary program centered in the humanities, Film Studies offers students latitude in defining their course of study within the framework established by the Film Studies Committee. With this freedom comes the responsibility of carefully planning a coherent and well-focused program. Because of the special demands of Film Studies and the diversity of its offerings, potential majors are encouraged to consult the director of undergraduate studies early in their academic careers.

The Film Studies major consists of fourteen term courses, including the prerequisite. A maximum of one course taken Credit/D/Fail may count toward the major with permission of the director of undergraduate studies.

**Prerequisite** Students normally take FILM 150 in their freshman or sophomore year. This course is useful preparation, and in some cases a prerequisite, for many other courses in the major.

**Required courses** Students are required to take FILM 320, preferably during their sophomore year. They must also take a course in film theory, preferably by the end of their junior year, selected from FILM 312, 314, 333, or 345. In addition, students must devote two term courses, preferably upper-level courses, to the study of representative films from at least two different nations or cultures (for example, German expressionist cinema, Italian cinema, American comedy).

Students must take one term course on the creative process in film. Appropriate courses are listed under "Production Seminars," but other courses in art, theater studies, or creative writing may be substituted with the permission of the director of undergraduate studies.

**Area of concentration** With the help of the director of undergraduate studies in Film Studies, each student defines an area of concentration comprising six courses leading up to and including the senior requirement. The six courses should form a coherent program in which the study of film is integrated with a particular discipline (history of art, literature, philosophy, the social sciences) or area of investigation (film theory, production, race and gender, photography, national or regional cultures and their cinemas). The focus of the concentration might also be a given historical or theoretical problem drawn from two areas, such as German expressionism in film and in art or narrative theory in film and in the novel.

Students choosing a production-related concentration often start by completing ART 141, 142 by the end of their sophomore year, and continue with ART 341, 342 by the end of their junior year, to prepare for FILM 455, 456, or 483, 484 in their senior year. They must take at least seven critical studies courses in the major. FILM 150, 312, 320, 333, 345, and the two required courses on national cinemas may be counted among the seven. Critical studies courses are defined as those not listed under "Production Seminars." Students with a concentration in filmmaking should also take courses in screenwriting, and vice versa.

**Senior requirement** During the senior year, each student takes one or two senior-level seminars or the equivalent and submits a senior essay or senior project, which should represent a culmination of work in the major and in Yale College. For the student

writing a senior essay, several options are possible. First, the student may enroll in two terms of relevant senior-level seminars (usually courses numbered in the 400s) and write a substantial term paper of twenty-five pages, double-spaced, for one of these courses. Second, the student may do independent research on a yearlong senior essay (FILM 491, 492). This option is intended for students with clearly defined topics that do not relate closely to a senior-level seminar. During the first two weeks of the first term of senior year, a petition for permission to do independent research should be submitted to the director of undergraduate studies in the form of a brief prospectus, approved by the proposed faculty adviser to the essay. Such research receives two terms of credit; the product of a two-term research essay is a work of at least fifty pages. Third, the senior requirement may be completed by combining one single-term senior-level seminar with one term of an independent research project (FILM 491 or 492), resulting in a paper of thirty-five pages. Whichever option is chosen, the essay should be written on a topic informed by the student's area of concentration. In researching and writing the essay, the student should consult regularly with the seminar instructor, supplying preliminary drafts as appropriate, and may consult with other faculty members as well.

Students who wish to complete a senior project as an alternative to an essay petition the Film Studies Committee for approval of their project at the end of the junior year. Projects might include writing a screenplay or producing a video. Students electing such an alternative should note that the project must be undertaken and accomplished over two terms. A limited number of students making films or videos are admitted to either the Advanced Fiction Film Workshop (FILM 483, 484) or the Documentary Film Workshop (FILM 455, 456), and receive three credits for their projects (two credits for FILM 483, 484 or 455, 456, and one for FILM 493 or 494). Such a choice effectively commits students to one extra course in addition to the fourteen courses required for the major, because FILM 493 or 494 does not count toward the fourteen required courses when taken in conjunction with FILM 483, 484 or 455, 456. Students may undertake a production project outside the workshops if (1) the Film Studies Committee approves their petition, (2) they have found a primary adviser qualified and willing to provide the necessary supervision, and (3) they have identified the equipment necessary to execute the project. Such students may count FILM 493 and 494 toward the fourteen courses required for the major.

Majors graduating in December must submit their senior essays or senior projects to the director of undergraduate studies by December 5; those graduating in May, by April 24. A second reader assigned by the director of undergraduate studies participates in evaluating the essay or project. In order to graduate from Yale College, a student majoring in Film Studies must achieve a passing grade on the senior essay or senior project.

Admission to senior-level seminars is at the instructor's discretion, but the Film Studies program will ensure that every senior major gains admission to the required number of seminars.

**The intensive major** Students of substantial accomplishment and commitment to film studies are encouraged to pursue the intensive major. Students in the intensive major complete a senior project in production and also write a senior essay on an unrelated topic. The intensive major in Film Studies is intended for students who

are not pursuing two majors. Students must request approval from the Film Studies Committee at the end of their junior year by submitting a proposal that outlines their objectives and general area of study.

**All majors** Study of relevant foreign languages is urged for all Film Studies majors. Students considering graduate work should become proficient in French or another modern language. Those choosing to study film in relation to a foreign culture must have good listening and reading abilities in that language.

Film Studies draws on the resources of many other departments and programs in the University. Students are encouraged to examine the offerings of other departments in both the humanities and the social sciences, as well as residential college seminars, for additional relevant courses. The stated area of concentration for each student normally determines the relevance and acceptability of other courses.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** FILM 150

**Number of courses** 14 term courses, incl prereq and senior req

**Specific courses required** FILM 320; FILM 312, 314, 333, or 345

**Distribution of courses** 6 courses in area of concentration; 2 courses in different national cinemas; 1 production course; if concentration is production-related, at least 7 critical studies courses

**Senior requirement** 2 terms of senior-level sems, or 2 terms of senior essay (FILM 491, 492), or 1 term of each; or 2 terms of senior project in FILM 455, 456, or 483, 484, and either FILM 493 or 494, for a total of 15 term courses; or 2 terms of senior project in FILM 493, 494 with approved petition

**Intensive major** Both senior essay and senior project

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## Required Courses

**FILM 150a, Introduction to Film Studies** John MacKay

A survey of film studies concentrating on theory, analysis, and criticism. Students learn the critical and technical vocabulary of the subject and study important films in weekly screenings. Prerequisite for the major. WR, HU

**FILM 314a / HUMS 209a, Media Archeology** Francesco Casetti and Mallory Ahern

An archaeological approach to the history of media, with a focus on the prehistory of now-ubiquitous technologies. Contrasting elements at play in the making of new media, including economics, science, and social needs; what inventors and innovators deemed possible at various points in history; social factors that cause new media technology to succeed or fail, and ways in which media in turn shape society.

\* **FILM 320b / HSAR 490b, Close Analysis of Film** John Connor

Ways in which traditional genres and alternative film forms establish or subvert convention and expectation and express thematic and ideological concerns. The balancing of narrative containment and excess, as well as action and image. Use of body and voice, space and music. Examples include films by Antonioni, Zhang, Ozu, and Hitchcock. Prerequisite: FILM 150. HU

**FILM 345b / HSAR 327b, Film Theory, Criticism, and Culture** Joshua Glick  
Survey of the major theories, questions, and debates surrounding cinema from the inception of the medium in the late nineteenth century to the present. Readings from articles and essays written by intellectuals, filmmakers, artists, critics, social scientists, and scholars from across the globe whose ideas have shaped understandings of moving images and their impact on society. Recommended preparation: FILM 150. HU

## National Cinemas

**FILM 240b / LITR 143b, World Cinema** Dudley Andrew  
Development of ways to engage films from around the globe productively. Close analysis of a dozen complex films, with historical contextualization of their production and cultural functions. Attention to the development of critical skills. Includes weekly screenings, each followed immediately by discussion. WR, HU

\* **FILM 241b / PLSH 246b, Polish Communism and Postcommunism in Film**  
Krystyna Illakowicz

The Polish film school of the 1950s and the Polish New Wave of the 1960s. Pressures of politics, ideology, and censorship on cinema. Topics include gender roles in historical and contemporary narratives, identity, ethos of struggle, ethical dilemmas, and issues of power, status, and idealism. Films by Wajda, Munk, Polanski, Skolimowski, Kieslowski, Holland, and Kedzierzawska, as well as selected documentaries. Readings by Milosz, Andrzejewski, Mickiewicz, Maslowska, Haltoff, and others. Readings and discussion in English. HU

\* **FILM 262a / FREN 255a, French Cinema** Thomas Kavanagh  
A broad cross-section of French films from *Lumiè re* to the present, placed in their relevant cultural and aesthetic contexts. Focus on French cinema's defining tension with film production in Hollywood and the United States, the dominant presence on the world market. L5, HU

\* **FILM 317b / SAST 310b, Understanding Bollywood** Staff  
Critical introduction to popular cinema of South Asia, its history, culture, and politics. Topics include nationalism, partition, gender, secularism, development, globalization, and diaspora. HU

**FILM 335a / HSAR 326a, Classical Hollywood: Art and Industry** John Connor  
Classical Hollywood studios as factories of aesthetic achievement and cultural dominance. Challenges to studios, including technical (the coming of sound, color, and widescreen), industrial (the production code, antitrust litigation, and the blacklist), and cultural (the Depression, World War II, and the rise of television). Landmark films from *The Jazz Singer* and *Citizen Kane* to *Casablanca* and *Rebel without a Cause*. HU

\* **FILM 363b / LITR 360b, Radical Cinemas of Latin America** Moira Fradinger  
Introduction to Latin American cinema, with an emphasis on post-World War II films produced in Cuba, Argentina, Brazil, and Mexico. Examination of each film in its historical and aesthetic aspects, and in light of questions concerning national cinema and "third cinema." Examples from both pre-1945 and contemporary films. Conducted in English; knowledge of Spanish and Portuguese helpful but not required. HU

\* **FILM 389b / EALL 275b / LITR 365b, Crime in Japanese Film and Fiction**

Aaron Gerow

The depiction of crime in Japanese film and fiction, with a focus on the detective and gangster genres. Social, historical, and aesthetic implications, as well as differences from Euro-American and Asian crime films. HU

\* **FILM 427a / AMST 319a, American Documentary Films** Michael Roemer

The documentary film from Flaherty to cinéma-vérité and beyond. Films examined for aesthetic value as well as social and political relevance. Emphasis on individual films and filmmakers. Screenings in class. Enrollment limited to juniors and seniors majoring in American Studies or in Film Studies. HU RP

\* **FILM 438b / AMST 416b, U.S. Cinema from 1960 to the Mid-1970s**

Michael Kerbel

An examination of significant developments in American narrative cinema from 1960 to the mid-1970s through close analysis of representative films. The decline of the studio system; Hollywood's departures from traditional genres, themes, structures, and styles; the treatment of previously forbidden subjects; the influence of avant-garde, documentary, and international film; the director's ascendance; representations of race, ethnicity, gender, and sexuality; relations between films and American politics, society, and culture. HU RP

\* **FILM 457b / ITAL 303b / LITR 359b, Italian Film from Postwar to Postmodern**

Millicent Marcus

A study of important Italian films from World War II to the present. Consideration of works that typify major directors and trends. Topics include neorealism, self-reflexivity and metacinema, fascism and war, and postmodernism. Films by Fellini, Antonioni, Rossellini, De Sica, Visconti, Pasolini, Bertolucci, Wertmuller, Tornatore, and Moretti. Most films in Italian with English subtitles. HU

\* **FILM 461b / ENGL 384b / THST 416b, British Cinema** Katie Trumpener

Survey of the British film tradition, emphasizing overlap with literature, drama, and art; visual modernism; documentary's role in defining national identity; "heritage" filmmaking and alternative approaches to tradition; and auteur and actors' cinema.

HU RP

## Film Theory, Visual Media, and Special Topics

\* **FILM 092a / GMAN 050a / HUMS 053a, Spectatorship and Visual Culture**

Brigitte Peucker

The position of the Western spectator from the eighteenth through the twentieth centuries in a variety of paradigmatic situations. Spectatorship in the contexts of landscape, painting, the city, and film. Looking and the imagination; the relation of the represented to the real; vision and the senses; the nature and politics of looking. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

**FILM 244a / AMST 247a / HIST 147a / HLTH 170a / HSHM 202a, Media and Medicine in Modern America** John Warner and Gretchen Berland

Relationships between medicine, health, and the media in the United States from 1870 to the present. The changing role of the media in shaping conceptions of the body, creating new diseases, influencing health and health policy, crafting the image

of the medical profession, informing expectations of medicine and constructions of citizenship, and the medicalization of American life. HU

**FILM 290b, Places of Amusement in American Culture** Joshua Glick

Spaces of recreation, leisure, and consumption in the United States in the twentieth and twenty-first centuries, with a focus on Coney Island, Disneyland, Las Vegas, and the digital worlds of online gaming. Such spaces as barometers of American culture. Relations between politics and space, technology and society, and individual and collective identity. Includes field trips to the Wadsworth Atheneum in Hartford and to Coney Island.

\* **FILM 305a / LITR 361a, History and Theory of Animation** Aaron Gerow

Survey of the history and theory of animation. Examples from around the world, from various traditions, and from different periods. HU

\* **FILM 324a / AMST 402a / ANTH 302a / WGSS 380a, Gender and Sexuality in Media and Popular Culture** Laura Wexler

Investigation of visual media and popular culture in the United States and transnationally. Gender, race, class, and sexuality in relation to the production, circulation, consumption, and reception of media culture. Focus on theories of media and the visual. Significant lab component in which students use media technologies to make and illustrate theoretical arguments. HU

\* **FILM 346b / GMAN 225b / LITR 362b, Intermediality in Film** Brigitte Peucker

The relationship of film to theater and painting, with the suggestion that where two media are in evidence, there is usually a third. Topics include space, motion, color, theatricality, tableau vivant, ekphrasis, spectatorship, and new media. Readings feature art-historical and film-theoretical texts as well as essays pertinent to specific films. HU

**FILM 356a / ENGL 185a / HUMS 161a, Medieval Literature in Movies**

Alastair Minnis

A study of medieval narrative traditions and their appropriation in modern film. *Beowulf*, selections from Chaucer's *Canterbury Tales*, and Malory's *Morte D'Arthur* are compared with modern film and television adaptations. HU

\* **FILM 357a / GMAN 408a / LITR 304a, Books, Displays, and Systems Theory**

Henry Sussman

A status report on the book as a medium in an age of cybernetic technology and virtual reality. The contentious no-man's land between books and contemporary systems. HU  
RP

**FILM 362a / FREN 384a / ITAL 384a / JDST 289a / LITR 338a, Representing the Holocaust** Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Lifé Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

\* **FILM 372a / AMST 316a, Los Angeles Culture and the 1960s** Joshua Glick  
Representations of Los Angeles by the city's artists, journalists, filmmakers, poets, and musicians from the late 1950s through the early 1970s. LA's social geography, its overlapping minority communities, and its high-tech, popular-arts, information, and military industries. Focus on the relationships between different kinds of media and on the international resonance of culture created within Los Angeles. HU

\* **FILM 375b / AMST 375b / WGSS 375b, LGBTQ Cinema** Ronald Gregg  
An introduction to queer film history. Focus on LGBTQ representation in Hollywood and experimental film from its beginning to the present, placed in social and political context. Topics include the impact of censorship, codes used to connote homosexuality, and how gay and antigay politics have affected representation. HU

\* **FILM 381a, The Film Melodrama** Brigitte Peucker  
The Hollywood melodrama of the 1930s through the 1950s. Recent transformations of the genre in modernism, in other national cinemas, as antimelodrama, and in television. Ways in which melodramas address their audiences through mise-en-scene, theatricality, and stars. Shifting racial and gender roles in the genre; melodrama as a vehicle of cultural identity. HU

\* **FILM 423b / AMST 364b / EVST 366b, Documentary and the Environment**  
Charles Musser  
Survey of documentaries about environmental issues, with a focus on *Darwin's Nightmare* (2004), *An Inconvenient Truth* (2006), *Food, Inc.* (2009), *GasLand* (2010), and related films. Brief historical overview, from early films such as *The River* (1937) to the proliferation of environmental film festivals. HU RP

\* **FILM 444a / AMST 136a / WGSS 376a, Sexual Modernity and Censorship in American Film** Ronald Gregg  
Romantic comedy, censorship, and the representation of sexual modernity in Hollywood film from the 1920s to the 1960s. Tensions between the studios' censorship code and émigré filmmakers' strategies to subvert it. Focus on the romantic comedies of Ernst Lubitsch and Billy Wilder, with some attention to the films of Cecil B. DeMille and Howard Hawks. HU RP

\* **FILM 469a / AMST 306a, The Films of Martin Scorsese** Michael Kerbel  
Close analysis of Scorsese's films, with attention to his themes and styles and to ways in which his works have assimilated literary and cinematic influences, reflected their eras, and influenced other directors. Scorsese's work examined in the context of film history, and of U.S. culture and history, from the 1960s to the present. HU RP

## Production Seminars

\* **ART 141a, Introductory Film Writing and Directing** Michael Roemer  
Problems and aesthetics of film studied in practice as well as in theory. In addition to exploring movement, image, montage, point of view, and narrative structure, students photograph and edit their own short videotapes. Emphasis on the writing and production of short dramatic scenes. Materials fee: \$150. Priority to majors in Art and in Film Studies. Prerequisite for Film Studies majors: FILM 150. RP

\* **ART 142b, Introductory Documentary Filmmaking** Sandra Luckow  
The art and craft of documentary filmmaking. Basic technological and creative tools for capturing and editing moving images. The processes of research, planning,

interviewing, writing, and gathering of visual elements to tell a compelling story with integrity and responsibility toward the subject. The creation of nonfiction narratives. Issues include creative discipline, ethical questions, space, the recreation of time, and how to represent "the truth." Materials fee: \$150. RP

**ART 341a or b, Intermediate Film Writing and Directing** Staff

In the first half of the term, students write three-scene short films and learn the tools and techniques of staging, lighting, and capturing and editing the dramatic scene. In the second half of the term, students work collaboratively to produce their films. Focus on using the tools of cinema to tell meaningful dramatic stories. Materials fee: \$150. Enrollment limited to 8. Priority to majors in Art and in Film Studies. ART 141 or 142, and FILM 150 RP

**ART 342b, Intermediate Documentary Filmmaking** Sandra Luckow

Students explore the storytelling potential of the film medium by making documentary art. The class concentrates on finding and capturing intriguing, complex scenarios in the world and then adapting them to the film form. Questions of truth, objectivity, style, and the filmmaker's ethics are considered using examples of students' work. Exercises in storytelling principles. Materials fee: \$150. Limited enrollment. Priority to majors in Art and in Film Studies. Prerequisites: ART 141 or 142, and FILM 150. HU RP

**\* FILM 350a or b, Screenwriting** Marc Lapadula

A beginning course in screenplay writing. Foundations of the craft introduced through the reading of professional scripts and the analysis of classic films. A series of classroom exercises culminates in intensive scene work. Prerequisite: FILM 150. Not open to freshmen.

**\* FILM 395b, Intermediate Screenwriting** Marc Lapadula

A workshop in writing short screenplays. Frequent revisions of each student's script focus on uniting narrative, well-delineated characters, dramatic action, tone, and dialogue into a polished final screenplay. Prerequisite: FILM 350. Priority to Film Studies majors.

**\* FILM 455a and FILM 456b / AMST 463a and AMST 464b, Documentary Film Workshop** Charles Musser

A yearlong workshop designed primarily for majors in Film Studies or American Studies who are making documentaries as senior projects. Seniors in majors other than Film Studies and American Studies admitted as space permits. RP

**\* FILM 483a and FILM 484b / ART 442a and ART 443b, Advanced Film Writing and Directing** Jonathan Andrews

A yearlong workshop designed primarily for Art and Film Studies majors making senior projects. Each student writes and directs a short fiction film. The first term focuses on the screenplay, production schedule, storyboards, casting, budget, and locations. In the second term students rehearse, shoot, edit, and screen the film. Materials fee: \$150. Enrollment limited to 8. Priority to majors in Art and in Film Studies. Enrollment limited to 8. Priority to majors in Art and in Film Studies. Prerequisite: ART 341.

**\* FILM 487a and FILM 488b, Advanced Screenwriting** Marc Lapadula

Students write a feature-length screenplay. Emphasis on multiple drafts and revision. Admission in the fall term based on acceptance of a complete step-sheet outline for the



story to be written during the coming year. Primarily for Film Studies majors working on senior projects. Prerequisite: FILM 395 or permission of instructor.

## Individual Research and Senior Essay Course or Project

### \* **FILM 471a or b, Independent Directed Study** Staff

For students who wish to explore an aspect of film studies not covered by existing courses. The course may be used for research or directed readings and should include one lengthy essay or several short ones as well as regular meetings with the adviser. To apply, students should present a prospectus, a bibliography for the work proposed, and a letter of support from the adviser to the director of undergraduate studies. Term credit for independent research or reading may be granted and applied to any of the requisite areas upon application and approval by the director of undergraduate studies.

### \* **FILM 491a and FILM 492b, The Senior Essay** John Connor

An independent writing and research project. A prospectus signed by the student's adviser must be submitted to the director of undergraduate studies by the end of the second week of the term in which the essay project is to commence. A rough draft must be submitted to the adviser and the director of undergraduate studies approximately one month before the final draft is due. Essays are normally thirty-five pages long (one term) or fifty pages (two terms).

### \* **FILM 493a and FILM 494b, The Senior Project** John Connor

For students making a film or video, either fiction or nonfiction, as their senior project. Senior projects require the approval of the Film Studies Committee and are based on proposals submitted at the end of the junior year. An interim project review takes place at the end of the fall term, and permission to complete the senior project can be withdrawn if satisfactory progress has not been made. For guidelines, consult the director of undergraduate studies. Does not count toward the fourteen courses required for the major when taken in conjunction with FILM 455, 456 or FILM 483, 484.

## Forestry and Environmental Studies

Program adviser: John Wargo, 124 KRN, 432-5123, john.wargo@yale.edu

The School of Forestry & Environmental Studies is primarily a graduate and professional program designed to train leaders to solve worldwide environmental problems and to provide new understanding of local and global environments through interdisciplinary research in the natural and social sciences. The School offers numerous courses to undergraduates in Environmental Studies, and undergraduates from any major can take courses in the School. Those undergraduates with significant interest should contact the School's undergraduate program adviser to discuss a joint degree program that allows Yale College students to earn both a bachelor's degree from Yale College and an M.E.M. degree from the School of Forestry & Environmental Studies in five years. For more information on the joint program, see the School's Web site (<http://environment.yale.edu/academics/degrees/five-year>). Most graduate-level courses are open to qualified undergraduates. Listings and detailed descriptions of these courses are available in the bulletin of the School of Forestry & Environmental Studies (<http://www.yale.edu/printer/bulletin/htmlfiles/forestry>), and most also appear in

the online bulletin of the Graduate School of Arts and Sciences (<http://www.yale.edu/printer/bulletin/htmlfiles/grad>).

Information about the programs of the School of Forestry & Environmental Studies may be found on the School's Web site (<http://environment.yale.edu>). Most lectures and symposia are open to undergraduates.

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## Courses

\* **F&ES 020a / EVST 020a, Sustainable Development in Haiti** Gordon Geballe  
The principles and practice of sustainable development explored in the context of Haiti's rich history and culture, as well as its current environmental and economic impoverishment. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR

**F&ES 255b / EVST 255b / PLSC 215b, Environmental Politics and Law** John Wargo  
Exploration of the politics, policy, and law associated with attempts to manage environmental quality and natural resources. Themes of democracy, liberty, power, property, equality, causation, and risk. Case histories include air quality, water quality and quantity, pesticides and toxic substances, land use, agriculture and food, parks and protected areas, and energy. SO

\* **F&ES 260a / EVST 260a, Structure, Function, and Development of Vascular Plants**  
Graeme Berlyn  
Morphogenesis and adaptation of trees from seed formation and germination to maturity. Physiological and developmental processes associated with structural changes in response to environment are discussed from both a phylogenetic and an adaptive point of view. SC

\* **F&ES 261a / EVST 261a / G&G 261a, Minerals and Human Health** Ruth Blake  
Study of the interrelationships between Earth materials and processes and personal and public health. The transposition from the environment of the chemical elements essential for life. After one year of college-level chemistry or with permission of instructor; G&G 110 recommended. SC

\* **F&ES 285b / EVST 285b, Political Ecology: Nature, Culture, and Power**  
Amity Doolittle  
Study of the relationship between society and the environment. Global processes of environmental conservation, development, and conflicts over natural resource use; political-economic contexts of environmental change; ways in which understandings of nature are discursively bound up with notions of culture and identity. SO

\* **F&ES 290b / EVST 290b, Geographic Information Systems** Charles Tomlin  
A practical introduction to the nature and use of geographic information systems (GIS) in environmental science and management. Applied techniques for the acquisition, creation, storage, management, visualization, animation, transformation, analysis, and synthesis of cartographic data in digital form.

**F&ES 307a / EVST 307a, Organic Pollutants in the Environment** Shimon Anisfeld  
An overview of the pollution problems posed by toxic organic chemicals, including petroleum, pesticides, PCBs, dioxins, chlorinated solvents, and emerging contaminants. Processes governing the environmental fate of organic pollutants, e.g., evaporation,

bioconcentration, sorption, and biodegradation. Technologies for prevention and remediation of organic pollution. No background in organic chemistry required.

**F&ES 315a / E&EB 115a, Conservation Biology** Linda Puth

An introductory principles underpinning efforts to conserve Earth's biodiversity. Efforts to halt the rapid increase in disappearance of both plants and animals. Discussion of sociological and economic issues. SC

**F&ES 327a / ENVE 327a / G&G 327a, Atmospheric Chemistry** Nadine Unger

The chemical and physical processes that determine the composition of the atmosphere; implications for climate, ecosystems, and human welfare. Origin of the atmosphere; photolysis and reaction kinetics; atmospheric transport of trace species; stratospheric ozone chemistry; tropospheric hydrocarbon chemistry; oxidizing power, nitrogen, oxygen, sulfur, and carbon cycles; interactions between chemistry, climate, and biosphere; aerosols, smog, and acid rain. Prerequisites: CHEM 115 or 118, and MATH 120, or equivalents. ENAS 194 recommended. QR, SC

\* **F&ES 344b / EVST 344b, Aquatic Chemistry** Gaboury Benoit

A detailed examination of the principles governing chemical reactions in water. Emphasis on developing the ability to predict the aqueous chemistry of natural, engineered, and perturbed systems based on a knowledge of their biogeochemical setting. Calculation of quantitative solutions to chemical equilibria. Focus on inorganic chemistry. Topics include elementary thermodynamics, acid-base equilibria, alkalinity, speciation, solubility, mineral stability, redox chemistry, and surface complexation reactions. SC

\* **F&ES 384a / ANTH 382a / EVST 345a, Environmental Anthropology**

Carol Carpenter

History of the anthropological study of the environment: nature-culture dichotomy, ecology and social organization, methodological debates, politics of the environment, and knowing the environment. SO

\* **F&ES 422a / ANTH 409a / EVST 422a, Anthropology of Climate Change, Past and Present** Michael Dove

The history of thinking regarding climate and society. Climate theory from the classical era and the Enlightenment; modern anthropological literature on social and environmental change, climatic vulnerability and control, and climate knowledge and its circulation. SO

## French

Director of undergraduate studies: Christopher Semk, Rm. 326, 82–90 Wall St., 432-4902, christopher.semk@yale.edu; language program director: Françoise Schneider, Rm. 313B, 82–90 Wall St., 432-8855, francoise.schneider@yale.edu; french.yale.edu

### FACULTY OF THE DEPARTMENT OF FRENCH

**Professors** R. Howard Bloch, Edwin M. Duval, Marie-Hélène Girard (*Visiting*), Alice Kaplan (*Chair*), Thomas Kavanagh, Christopher L. Miller, Maurice Samuels (*Acting Chair* [F])

**Assistant Professors** Morgane Cadieu, Thomas C. Connolly, Christopher Semk, Yue Zhuo

**Senior Lecturer** Maryam Sanjabi

**Lecturers** Diane Charney, Alyson Waters

**Senior Lectors** Kathleen Burton, Ruth Koizim, Soumia Koundi, Matuku Ngame, Lauren Pinzka, Françoise Schneider, Constance Sherak, Candace Skorupa

**Lectors** Audrey Hoffmann, Vanessa Vysosias

The Department of French has two distinct but complementary missions: to provide instruction in the French language at all levels of competence, and to lead students to a broad appreciation and deep understanding of the literatures and cultures of France and other French-speaking countries.

The major in French is a liberal arts major, designed for those who wish to study one of the world's greatest and richest literatures in depth. The department offers courses devoted to authors, works, and literary and cultural movements that span ten centuries and four continents. The curriculum also includes interdisciplinary courses on relations between literature and other areas of study such as history, law, religion, politics, and the arts. Majors are encouraged to explore all periods and genres of literature in French, as well as a wide variety of critical approaches.

Excellent knowledge of a foreign language and a mature, informed appreciation of a foreign literature open doors to many professions. The French major provides ideal preparation for careers not only in academics but also in a wide range of fields from law and diplomacy to journalism and the arts. Recent graduates have gone on to selective law schools and graduate programs in French and comparative literature. Others work in primary and secondary education, business, government, and a variety of nongovernmental agencies and international organizations.

French can be taken either as a primary major or as one of two majors, in consultation with the director of undergraduate studies. Appropriate majors to combine with French might include, but are not limited to, African American Studies, African Studies, English, Film Studies, Global Affairs, History, History of Art, Humanities, Literature, Music, Philosophy, Political Science, Theater Studies, and Women's, Gender, and Sexuality Studies. Regulations concerning the completion of two majors can be found in Special Arrangements, Section K (p. 63), of the Academic Regulations.

**Study abroad** Students are encouraged to spend a term or a year abroad, for which appropriate course credit is granted. Summer study abroad may also, in some cases, receive course credit. Further information may be obtained from the Center for International and Professional Experience (<http://cipe.yalecollege.yale.edu>) and from Ruth Koizim ([ruth.koizim@yale.edu](mailto:ruth.koizim@yale.edu)), the study abroad adviser for the Department of French. The Kenneth Cornell Charitable Foundation provides some financial support for majors who undertake research projects related to their work in the major in France or a francophone country. Contact the director of undergraduate studies for details.

**The major for the Class of 2015** Students in the Class of 2015 may fulfill the requirements of the standard or intensive French major that were in place when they entered the major, as described in previous editions of this bulletin (<http://>

[www.yale.edu/printer/bulletin/archivepdf/files/YCPS](http://www.yale.edu/printer/bulletin/archivepdf/files/YCPS)). Alternatively, they may fulfill the requirements for the major as described below for the Class of 2016 and subsequent classes.

**Prerequisite for the Class of 2016 and subsequent classes** Candidates for the major should take FREN 150 or the equivalent during the freshman or sophomore year. Prospective majors are strongly encouraged to take at least one literature course numbered 170 or above before the end of the sophomore year.

**The standard major for the Class of 2016 and subsequent classes** The standard major consists of ten term courses numbered 160 or above, including a one-term senior essay (see below). One of these ten courses must be FREN 170 or the equivalent, which should be completed early in a candidate's studies; at least four must be Group B courses numbered 200 or above. Students may count no more than two courses in the FREN 180–199 range and no more than two courses conducted in English (Group C) toward the major. With prior approval of the director of undergraduate studies, a maximum of four term courses taught outside the Yale Department of French but bearing directly on the student's principal interest may be counted toward the major. Up to two of these may be taken in other departments at Yale, and up to four may be taken as part of a Year or Term Abroad or summer study abroad program. However, the combined number of courses from other departments and from study abroad may not exceed four. (The director of undergraduate studies may grant exceptions to this limit for students who spend two academic terms in an approved study abroad program.) Relevant freshman seminars may count toward the major, with permission of the director of undergraduate studies.

**The intensive major for the Class of 2016 and subsequent classes** The intensive major is designed for students who wish to undertake a more concentrated study of literature in French. It is recommended for students considering graduate study in French or in comparative literature. The intensive major consists of twelve term courses numbered 160 or above, including a one-term or two-term senior essay (see below). At least five courses must be from Group B and numbered 200 or above. The requirement of FREN 170 and the stipulations for courses in the 180–199 range, courses conducted in English, and courses taken outside the department are identical to those for the standard major.

**Senior requirement** All majors must write a senior essay showing evidence of careful reading and research and substantial independent thought. Essays may be written in either French or English and must be prepared under the direction of a ladder faculty member in the Department of French. Students planning to pursue advanced work in French after graduation are encouraged to write their senior essay in French.

Students writing a one-term essay enroll in FREN 491 in the senior year. A one-term essay may be written in either the fall or the spring term and should be approximately thirty pages in length. A preliminary statement indicating the general area to be addressed and the name of the adviser must be submitted to the director of undergraduate studies by September 12 (fall-term essay) or November 7 (spring-term essay). A one-page prospectus and bibliography are due September 19 (fall term) or January 23 (spring term). A rough draft must be submitted to the adviser by October

31 (fall term) or March 27 (spring term). Two copies of the final essay are due in the department by December 1 (fall term) or April 20 (spring term).

Students electing a two-term essay for the intensive major must select their subject and adviser by the end of the junior year and enroll in FREN 493 and 494 during the senior year. The essay should be approximately sixty pages in length. A preliminary statement indicating the general area to be addressed and the name of the adviser must be submitted to the director of undergraduate studies by September 12. A one-page prospectus and bibliography are due September 19. Students must submit an initial rough draft to their adviser by January 23 and a complete draft by March 27. Two copies of the final essay are due in the department by April 20.

**All majors** Students in the major are encouraged to take as many advanced courses as possible in all historical periods from the Middle Ages to the present. Candidates for the major should consult the director of undergraduate studies as early as the beginning of the sophomore year and no later than the fall term of the junior year. Schedules must be approved and signed by the director of undergraduate studies. Students planning to study abroad or to petition for completion of two majors should contact the director of undergraduate studies during the sophomore year. Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

**Special Divisional Major** The department will support the application of qualified students who wish to pursue an interdisciplinary course in French studies. Under the provisions of the Special Divisional Major, students may combine courses offered by the French department with subjects elected from other departments. Close consultation with departmental advisers is required; candidates for a Special Divisional Major should consult the director of undergraduate studies in French by the fall term of the junior year. For further information, see under Special Divisional Majors (p. 653).

**Group A courses** (FREN 110–159) This group consists of language courses that lead directly to courses counting toward the major. Preregistration is required for all Group A courses except FREN 125 and 145. For further details, students should see the language program director.

**Group B courses** (FREN 160–449, not including Group C courses) This group contains more advanced courses that are taught in French and count toward the major. FREN 160 and 170 are gateway courses that prepare students for courses numbered FREN 200 and above. Courses in the FREN 180–199 range are advanced language courses. Courses numbered 200–449 are advanced courses in literature and culture. The 200–299 range contains courses devoted to broad, general fields defined by century or genre; the 300–449 range contains courses devoted to specific topics within or across those general fields.

**Group C courses** This group comprises courses taught in English; readings may be in French or English. Two term courses from this group may be counted for credit toward the major.

**Placement** Proper placement is essential for productive language study. All students who have not yet taken French at Yale are expected to take the online departmental placement examination prior to the beginning of the academic year. Students who study abroad during the summer with a non-Yale program must take the placement

examination to qualify for credit for their study and to be placed in the appropriate more advanced course.

Only the following students are exempt from taking the online placement examination:

1. Students who have no previous knowledge of French whatsoever. These students must still preregister on line for FREN 110.
2. Students who received a score of 5 on the Advanced Placement examination in French, a score of 6 or 7 on the higher-level International Baccalaureate examination, or a grade of A or B on the GCE A-level examination. These students should discuss their proper course placement with the director of undergraduate studies, who will be present during the advising session held by the department at the beginning of the fall term. Visit the departmental Web site (<http://french.yale.edu/academics/placement-and-registration>) for details.

Please note that the online departmental placement examination is given only once a year, prior to the beginning of the academic year. Students who wish to begin taking French in the spring must take the examination before the fall term. Details about placement and preregistration will be posted on the departmental Web site (<http://french.yale.edu/academics/placement-and-registration>).

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** FREN 150 or equivalent

**Number of courses** *Standard major*—10 term courses numbered 160 or above; *Intensive major*—12 term courses numbered 160 or above

**Specific course required** FREN 170 or equivalent

**Distribution of courses** *Standard major*—at least 4 courses in Group B numbered 200 or above; no more than 2 courses numbered FREN 180–199; no more than 2 courses conducted in English; *Intensive major*—same, plus 1 addtl Group B course numbered 200 or above

**Substitution permitted** With prior approval of DUS, up to 4 term courses outside French dept, as specified

**Senior requirement** *Standard major*—one-term senior essay in French or English (FREN 491); *Intensive major*—one-term (FREN 491) or two-term (FREN 493, 494) senior essay in French or English

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### Group A Courses

\* **FREN 110a, Elementary and Intermediate French I** Staff

Intensive training and practice in all the language skills, with an initial emphasis on listening and speaking. Emphasis on communicative proficiency, self-expression, and cultural insights. Extensive use of audio and video material. Conducted entirely in French. Mandatory weekly tests given on Mondays at 30-minute intervals from 5 to 8:30 p.m. To be followed by FREN 120. For students with no previous experience of French. Daily classroom attendance is required. Online preregistration required; see [french.yale.edu](http://french.yale.edu) for details. Credit only on completion of FREN 120. L1 RP

1½ Course cr

**\* FREN 120b, Elementary and Intermediate French II** Staff

Continuation of FREN 110. Conducted entirely in French. Only after FREN 110. Online preregistration required; see french.yale.edu for details. To be followed by FREN 130.

L2 RP 1½ Course cr

**\* FREN 121a or b, Intermediate French** Staff

Designed for initiated beginners, this course develops all the language skills with an emphasis on listening and speaking. Activities include role playing, self-expression, and discussion of cultural and literary texts. Emphasis on grammar review and acquisition of vocabulary. Frequent audio and video exercises. Conducted entirely in French. Daily classroom attendance is required. Placement according to placement test score. Online preregistration required; see french.yale.edu for details. L2 RP 1½ Course cr

**\* FREN 125a, Intensive Elementary French** Constance Sherak

An accelerated course that covers in one term the material taught in FREN 110 and 120. Practice in all language skills, with emphasis on communicative proficiency. Admits to FREN 145. Conducted entirely in French. For students of superior linguistic ability. No preregistration required. L1, L2 RP 2 Course cr

**\* FREN 130a or b, Intermediate and Advanced French I** Staff

The first half of a two-term sequence designed to develop students' proficiency in the four language skill areas. Prepares students for further work in literary, language, and cultural studies, as well as for nonacademic use of French. Oral communication skills, writing practice, vocabulary expansion, and a comprehensive review of fundamental grammatical structures are integrated with the study of short stories, novels, and films. Admits to FREN 140. Conducted entirely in French. After FREN 120, 121, or a satisfactory placement test score. Online preregistration required; see french.yale.edu for details. L3 RP 1½ Course cr

**\* FREN 140a or b, Intermediate and Advanced French II** Staff

The second half of a two-term sequence designed to develop students' proficiency in the four language skill areas. Introduction of more complex grammatical structures. Films and other authentic media accompany literary readings from throughout the francophone world, culminating with the reading of a longer novel and in-class presentation of student research projects. Admits to FREN 150. Conducted entirely in French. After FREN 130 or a satisfactory placement test score. Online preregistration required; see french.yale.edu for details. L4 RP 1½ Course cr

**\* FREN 145b, Intensive Intermediate and Advanced French** Candace Skorupa

An accelerated course that covers in one term the material taught in FREN 130 and 140. Emphasis on speaking, writing, and the conversion of grammatical knowledge into reading competence. Admits to FREN 150. For students of superior linguistic ability. Conducted entirely in French. After FREN 120, 121, or 125. No preregistration required.

L3, L4 RP 2 Course cr

**\* FREN 150a or b, Advanced Language Practice** Staff

An advanced language course intended to improve students' comprehension of spoken and written French as well as their speaking and writing skills. Modern fiction and nonfiction texts familiarize students with idiomatic French. Special attention to grammar review and vocabulary acquisition. Conducted entirely in French. After FREN 140, 145, or a satisfactory placement test score. May not be taken after FREN 151. Online preregistration required; see french.yale.edu for details. L5 RP



## Group B Courses

Group B courses are conducted entirely in French. Courses numbered from 160 to 199 are open to students who have passed FREN 150 or the equivalent, and to others with consent of the department. Courses numbered from 200 to 449 are open to students who have passed FREN 170, or with permission of the instructor. Students who have taken a course at the 200 level or higher may not ordinarily take a 100-level course for credit, with the exception of advanced language courses numbered 185 or higher. Students may take 200-, 300-, and 400-level courses in any order. Courses in the 200–299 range are devoted to general fields; courses in the 300–449 range are devoted to specific topics.

### GATEWAY COURSES

\* **FREN 160a or b, Advanced Culture and Conversation** Staff

Intensive oral practice designed to further skills in listening comprehension, speaking, and reading through the use of videos, films, fiction, and articles. Emphasis on contemporary French and francophone cultures. Conducted entirely in French. Prerequisites: FREN 150, 151, or a satisfactory placement test score, or with permission of the course director. May be taken concurrently with or after FREN 170. L5 RP

\* **FREN 170a or b, Introduction to the Study of Literature in French** Staff

Introduction to close reading and analysis of literary texts written in French. Works by authors such as Marie de France, Molière, Balzac, Hugo, Baudelaire, Duras, Proust, and Genet. May not be taken after FREN 171. L5, HU

### ADVANCED LANGUAGE COURSES

\* **FREN 195a, Advanced Writing Workshop** Audrey Hoffmann

An advanced writing course for students who wish to work intensively on perfecting their written French. Frequent compositions of varying lengths, including creative writing, *rédactions* (compositions on concrete topics), and *dissertations* (critical essays). Recommended for prospective majors. Conducted entirely in French. After FREN 150 or higher, or a satisfactory placement test score. May be taken after courses in the 200–449 range. L5

\* **FREN 198b, Applied Advanced French Grammar** Constance Sherak

In-depth study of grammar and discourse strategies. Advanced grammar exercises, linguistic analysis of literary selections, and English-to-French translation. Intended to improve students' written command of French and to prepare them for upper-level courses; recommended for prospective majors. After FREN 150 or higher, or a satisfactory placement test score. May be taken after courses in the 200–449 range. L5

### GENERAL FIELDS

\* **FREN 200b, Literary Analysis and Theory** Yue Zhuo

Close readings of short literary masterpieces of the modern period, supplemented by critical readings that introduce various theoretical approaches. Primary authors include Flaubert, Maupassant, Baudelaire, Proust, Sartre, Duras, and Quignard. May not be taken after FREN 175. L5, HU

\* **FREN 217b, The French Renaissance** Edwin Duval

A survey of the literature of the French Renaissance, focusing on major authors, works, and literary movements in their historical and cultural contexts. Works include

Rabelais's *Gargantua*, Marguerite de Navarre's *Heptaméron*, Ronsard's *Amours*, Du Bellay's *Regrets*, and Montaigne's *Essais*. L5, HU

**\* FREN 219a, Seventeenth-Century French Literature** Christopher Semk

An introduction to the principal literary genres of seventeenth-century France in their historical context. Genres include comic and tragic theater (Molière, Corneille, Racine), religious oratory (Bossuet), the early psychological novel (*La Princesse de Clèves*), the maxim (La Rochefoucauld), and the fable (La Fontaine). L5, HU

**\* FREN 232a, French Fiction since 1800** Yue Zhuo

Close reading of major French novels and novellas written from 1800 through the 1980s. Emphasis on the use of narrative voice and on stylistic innovations. Authors include Chateaubriand, Constant, Balzac, Proust, Sartre, Beauvoir, Queneau, Duras, and Toussaint. May not be taken after FREN 240. L5, HU

**\* FREN 255a / FILM 262a, French Cinema** Thomas Kavanagh

A broad cross-section of French films from *Lumière* to the present, placed in their relevant cultural and aesthetic contexts. Focus on French cinema's defining tension with film production in Hollywood and the United States, the dominant presence on the world market. L5, HU

**FREN 270a, Mad Poets of the Nineteenth and Twentieth Century** Thomas Connolly

Nineteenth- and twentieth-century French poetry explored through the lives and works of poets whose ways of behaving, creating, and perceiving the world might be described as insane. Authors include Nerval, Baudelaire, Rimbaud, Verlaine, Mallarmé, Lautréamont, Apollinaire, Jacob, Breton, and Artaud. Lectures in English; readings available both in French and in English translation. Discussion sections conducted in French or English. WR, HU

**SPECIAL TOPICS**

**\* FREN 306a, Trains in French Literature and Culture** Staff

The aesthetics of trains in French and Francophone literature, film, visual arts, and comics. New representations of memory, history, and free will produced by the introduction of trains into literary narratives. Authors include Zola, Breton, Cendrars, Butor, Tardieu, Sembène, and Mabanckou. L5, HU

**\* FREN 366a / HSAR 251a / HUMS 167a, Writers and Artists in Paris, 1780–1914**  
Marie-Hélène Girard

Ways in which the transformation of Paris shaped the representation of artists who lived and worked in the French capital from the end of the Old Regime until the eve of World War I. The emergence of Paris as a cultural marker; the role played by the image of the bohemian or the *artiste maudit*. Authors and artists include David, Balzac, Delacroix, Baudelaire, Manet, Mallarmé, impressionist painters, and Picasso. L5, HU

**\* FREN 388b / HUMS 162b, Feminine Voices in French Literature** R. Howard Bloch

An exploration of women's voices in French literature from the Middle Ages to the mid-twentieth century. The specificity of the feminine voice, the plurality of feminine voices, love and sexuality, and social and professional identity. Authors include Marie de France, Marguerite de Navarre, George Sand, Maryse Condé, and Marguerite Duras. Readings and discussion in English. WR, HU

\* **FREN 416a, Contemporary Tales of Social Mobility** Staff

Mobility in the French social landscape and representations of class in contemporary French fiction. The question of social change through gender, sexuality, and race; the representation of work and the workplace; the interaction between social class and literary style. Works by Ernaux, Genet, Eribon, Louis, and Marivaux. L5, HU

\* **FREN 425b, North African Poetry in French** Thomas Connolly

Introduction to North African poetry composed in French during the twentieth and twenty-first centuries. Works explored within the broader context of metropolitan French and Arabic poetry; juxtaposition with other modes of expression including painting, dance, music, the Internet, and film. The literary, aesthetic, political, religious, and philosophical significance of poetic discourse.

## Special Tutorial and Senior Courses

\* **FREN 470a and FREN 471b, Special Tutorial for Juniors and Seniors**

Christopher Semk

Special projects set up by the student in an area of individual interest with the help of a faculty adviser and the director of undergraduate studies. Intended to enable the student to cover material not offered by the department. The project must terminate with at least a term paper or its equivalent and must have the approval of the director of undergraduate studies. Only one term may be offered toward the major, but two terms may be offered toward the bachelor's degree. For additional information, consult the director of undergraduate studies.

\* **FREN 491a or b, The Senior Essay** Christopher Semk

A one-term research project completed under the direction of a ladder faculty member in the Department of French and resulting in a substantial paper in French or English. For additional information, consult the director of undergraduate studies.

\* **FREN 493a and FREN 494b, The Senior Essay in the Intensive Major**

Christopher Semk

A yearlong research project completed under the direction of a ladder faculty member in the Department of French and resulting in a paper of considerable length, in French or English. For additional information, consult the director of undergraduate studies.

## Group C Courses

Courses in Group C are conducted in English; readings may be in French or English. Group C courses numbered above 100 are open to all students in Yale College.

**FREN 240b / HUMS 201b / LITR 214b, The Modern French Novel**

Alice Kaplan and Maurice Samuels

A survey of major French novels, considering style and story, literary and intellectual movements, and historical contexts. Writers include Balzac, Flaubert, Proust, Camus, and Sartre. Readings in translation. One section conducted in French. HU TR

\* **FREN 305a / ENGL 157a / HUMS 159a, Medieval Biography** Ardis Butterfield

The sources, aims, and diversity of biographical forms in medieval literature. Analysis of the medieval world through the study of autobiography, hagiography, political martyrology, and literary biography; the challenges of viewing a historical

period primarily through a single life. Includes a research trip to New York City. Recommended preparation: reading knowledge of French. HU TR

\* **FREN 342b / HUMS 250b / LITR 235b, French Literary Movements from Romanticism to Decadence** Yue Zhuo

A study of key texts, ideas, and events that shaped literary history in the nineteenth and early twentieth centuries, from romanticism, realism, and naturalism to Symbolism and Decadence. Literary works by Chateaubriand, Mme de Staël, Constant, Mérimée, Balzac, Baudelaire, Zola, Rimbaud, Mallarmé, Maupassant, Huysmans, and Proust.

HU TR

\* **FREN 345a, The Prose Poem** Thomas Connolly

An examination of the *poè me en prose*, from its beginnings as a response to the inadequacy of French verse forms through its emergence as an independent genre. L5, HU

\* **FREN 355a / LITR 234a, Camus and the Postwar Era** Alice Kaplan

The literary and political career of French-Algerian writer Albert Camus (1913–60). His major novels and essays read both from a stylistic point of view and in the context of World War II, the Algerian War, and debates over terrorism, the death penalty, and humanitarianism. HU TR

\* **FREN 376b / AFAM 383b / AFST 476b, The Two Congos: Literature and Culture in the Heart of Africa** Christopher Miller

An interdisciplinary approach to two nations that share a name, a river, and elements of culture but that are divided by colonial heritage (one Belgian, one French). Emphasis on literature, with references to history, film, anthropology, art, politics, music, and sports. Views from outside the two countries (*Heart of Darkness*, *Tintin*, V.S. Naipaul) and inside (H. Lopes, V. Y. Mudimbe, A. Mabanckou, S. Mukasonga). The 1974 Ali-Foreman "Rumble in the Jungle" boxing match; Rwandan genocide in film and literature. Reading knowledge of French required. HU

**FREN 384a / FILM 362a / ITAL 384a / JDST 289a / LITR 338a, Representing the Holocaust** Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Life Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

## Reading Course

\* **FREN 109a or b, French for Reading** Staff

Fundamental grammar structures and basic vocabulary are acquired through the reading of texts in various fields (primarily humanities and social sciences, and others as determined by student interest). Intended for students who either need a reading knowledge of French for research purposes or are preparing for French reading examinations and who have had no (or minimal) prior study of French. No preregistration required. Conducted in English. Does not satisfy the language requirement.

## Freshman Seminar Program

The Freshman Seminar program offers a diverse array of courses open only to freshmen and designed with freshmen in mind. Enrollment in seminars is limited to fifteen or eighteen students, depending on the nature of the course. Most seminars meet twice each week and do not, unless otherwise noted, presume any prior experience in the field. Students must apply and preregister for freshman seminars before the beginning of each term. To ensure that all applicants share an equal chance at enrolling in a seminar, students are admitted by lottery from among those who apply. Students who do not preregister may be considered for placement at the instructor's discretion if space is available. Information regarding application procedures may be found on the program's Web site (<http://yalecollege.yale.edu/academics/special-academic-programs/residential-college-seminar-program>).

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### COURSES

\* **AFAM 010a / AMST 018a / ENGL 014a, Twentieth-Century African American**

Poetry Elizabeth Alexander

African American poetry from Paul Laurence Dunbar to the present, with special attention to the contemporary Black poetry renaissance. Works explored in the contexts of locale, history, and literary and cultural movements. Research conducted in the Beinecke Library's archives and in other archival collections at Yale. Includes attendance at poetry readings on campus, classroom visits by practicing poets in the contemporary canon, and a field trip to New York City. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU RP

\* **AFAM 060a / AMST 060a / HIST 016a, Significance of American Slavery**

Edward Rugemer

The history of American slavery, its destruction during the nineteenth century, and its significance today. Topics include the origins of slavery, the development of racism, the transatlantic slave trade, the experience of enslavement, resistance to slavery, the abolitionist movement, the process of emancipation, and the perpetuation of slavery and other forms of unfree labor in the twenty-first century. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **AMST 002b / HIST 028b, American Consumer Culture in the Twentieth Century**

Jean-Christophe Agnew

An interdisciplinary introduction to twentieth-century American consumer culture, exploring the rise (and fall) of mass consumption and its impact on the experience of family, faith, citizenship, community, gender, race, ethnicity, and politics. The changing moral valuations of consumption; the effect of consumerism on ritual life; the Americanization of immigrants and the marketing of race and ethnicity; consumer culture's reciprocal relations with literature and the arts; the politics of consumer resistance; suburbanization; the consumer model of citizenship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **AMST 017a / ER&M 017a / HUMS 077a, Travel Literature of the Americas**

Dixa Ramirez

Evolving visions of the so-called New World from 1492 to the present. Readings from fictional and nonfictional accounts of travel to or throughout the Americas. Visual

examples of travel narratives, including tourism ads; some attention to scholarly criticism. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **AMST 019a / HIST 018a, Commodities as U.S. History** Matthew Jacobson  
American social, cultural, and political history introduced through study of the production, distribution, and consumption of common commodities. Topics include political economy, slavery, industrialization, labor, the rise of the corporation, the growth of the administrative and regulatory state, geopolitics, foreign policy, and cultural change. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. RP

\* **ANTH 011b, Reproductive Technologies** Marcia Inhorn  
Introduction to scholarship on the anthropology of reproduction. Focus on reproductive technologies such as contraceptives, prenatal diagnostics, childbirth technologies, abortion, assisted reproduction, surrogacy, and embryonic stem cells. The globalization of reproductive technologies, including social, cultural, legal, and ethical responses. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO  
Anthropology: Sociocultural

\* **ANTH 012b, Exploring Sport, Society, and Culture** William Kelly  
Introduction to critical sport studies. Exploration of the nature of sports, the emergence of modern sports, and implications of sports for health, technology, ethics, gender, sexuality, class, race, nationalism, and globalization. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR  
Anthropology: Sociocultural

\* **ANTH 030b / ARCG 030b / LAST 030b, Inca Culture and Society** Richard Burger  
History of the Inca empire of the Central Andes, including the empire's impact on the nations and cultures it conquered. Overview of Inca religion, economy, political organization, technology, and society. Ways in which different schools of research have approached and interpreted the Incas over the last century, including the influence of nationalism and other sources of bias on contemporary scholarship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO  
Anthropology: Archaeology

\* **ANTH 040b, The Evolution of Human Uniqueness** David Watts  
Current ideas in anthropology about what facilitated the evolutionary success of *Homo sapiens* and what distinguishes humans from other primates. The fossil and archaeological records for human evolution and the evolution of social behavior; research on nonhuman primate behavior and cognitive abilities, with an emphasis on chimpanzees; insights and limitations of comparative primate research. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO  
Anthropology: Biological

\* **APHY 050b / PHYS 050b, Science of Modern Technology** Daniel Prober  
Examination of the science behind selected advances in modern technology. Focus on the scientific and contextual basis of each advance. Topics are developed by the participants with the instructor and with guest lecturers, and may include nanotechnology, quantum computation and cryptography, optical systems for

communication and medical diagnostics, transistors, satellite imaging and global positioning systems, large-scale immunization, and DNA made to order. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

SC RP

\* **ART 002b, Paper** Elana Herzog

Paper as a material for making art. How paper is made; myriad ways that it is used in the collections of Yale's galleries and libraries. Creation of paper objects to explore the formal properties of sculpture, including volume, mass, line, and structure. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

RP

\* **ART 004a, Words and Pictures** Dushan Petrovich

Introduction to visual narration, the combination of words and pictures to tell a story. Narrative point of view, counternarrative and counterculture, visual satire, personal history, depictions of space and time, and strategies and politics of representation. Sources include illuminated manuscripts, biblical paintings, picture-stories, comic strips, and graphic novels. HU RP

\* **ART 005a, Interactive Concrete Poetry** Laurel Schwulst

Exploration of concrete poetry, a genre that uses semantic, visual, and phonetic elements of language as raw materials to arrange words in space. Survey of concrete poetry as an international historic art movement from the 1950s through the 1970s. Students create their own poems that respond to contemporary ideas of digital space. Introduction to basic code languages such as HTML and CSS. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. RP

\* **ART 006a, Art of the Printed Word** Richard Rose

Introduction to the art and historical development of letterpress printing and to the evolution of private presses. Survey of hand printing; practical study of press operations using antique platen presses and the cylinder proof press. Material qualities of printed matter, connections between content and typographic form, and word/image relationships. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **ASTR 030a, Search for Extraterrestrial Life** Michael Faison

Introduction to the search for extraterrestrial life. Review of current knowledge on the origins and evolution of life on Earth; applications to the search for life elsewhere in the universe. Discussion of what makes a planet habitable, how common these worlds are in the universe, and how we might search for them. Survey of past, current, and future searches for extraterrestrial intelligence. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, SC

\* **ASTR 040b, Expanding Ideas of Time and Space** Louise Edwards

Introduction to cosmology through critical exploration of everyday notions of space and time. Topics include the natures of nothing, time, space, and light; the shape of the universe; special and general relativity; dark and light matter; and dark energy. Observations and ideas that support astronomers' current model of the universe as an expanding and accelerating four-dimensional space-time. SC

\* **CLCV 002b / HUMS 095b, The Romans: A Cultural Introduction**

Kirk Freudenburg

An introduction to ancient Roman culture, with special focus on the lives of common citizens, non-elites, foreigners, freedmen, and slaves. Topics include family life, the ideology of empire, religious life, spectacles of power, dining, entertainments, bathing, travel, satire, and the law. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **ENGL 010b, Jane Austen** Stefanie Markovits

Close study of Austen's novels, with special attention to the critique of social and literary convention. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

English: Pre-1900 Lit

\* **ENGL 012a / AMST 016a / HUMS 052a, Literary Cities: New York, Chicago, San Francisco** Wai Chee Dimock

An introduction to American literature, told through the vibrant lives, ethnic diversities, and innovative genres revolving around three urban centers. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

English: American Lit

\* **ENGL 013b, Forms of Communication and Intimacy** Jill Campbell

New forms of electronic communication and their effects on social relationships and individuals' sense of self. Advantages and limitations of these forms in relation to means of communication and intimacy not dependent on electronic mediation. Correspondence by post, in-person conversation and nonverbal communication, social gatherings centered on food, erotic intimacy, group sociability, and silence. Analytical and creative writing assignments. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **ENGL 016b, Technomodernism** Justin Neuman

The relationship between technology and Anglophone literature from 1893 to 1922. Focus on machines of war, communication, and transportation. Canonical modernists such as Eliot, Joyce, Stein, Kafka, Woolf, and Forster; artistic movements, including imagism, expressionism, futurism, cubism, and surrealism. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **ENGL 033b / AMST 346a, American Literature in the World** Wai Chee Dimock

American literature as a gateway to the rest of the world. Key texts from the eighteenth century to the twenty-first, including works by Olaudah Equiano, Thomas Jefferson, Gertrude Stein, James Baldwin, Monique Truong, Ruth Ozeki, Jhumpa Lahiri, Barbara Kingsolver, Agha Shahid Ali, Cristina Garcia, Junot Diaz, and Dave Eggers. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

WR, HU

English: American Lit

\* **F&ES 020a / EVST 020a, Sustainable Development in Haiti** Gordon Geballe

The principles and practice of sustainable development explored in the context of Haiti's rich history and culture, as well as its current environmental and economic impoverishment. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR



\* **G&G 010a / EVST 010a, Earth, Resources, Energy, and the Environment**

David Evans

Humankind's interactions with, and place within, the natural world. Plate tectonics and natural disasters, biological evolution and mass extinction, human evolution, population growth and ecology, industrial resources, groundwater and pollution, fossil fuels and energy transitions, the carbon cycle and greenhouse gases, paleoclimates, current global warming, alternative energies, and a planetary perspective on the Earth as a singular oasis in space. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SC

\* **GMAN 050a / FILM 092a / HUMS 053a, Spectatorship and Visual Culture**

Brigitte Peucker

The position of the Western spectator from the eighteenth through the twentieth centuries in a variety of paradigmatic situations. Spectatorship in the contexts of landscape, painting, the city, and film. Looking and the imagination; the relation of the represented to the real; vision and the senses; the nature and politics of looking. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **HIST 007a / AMST 014a, History of U.S.–Latin American Relations**

Jenifer Van Vleck and Taylor Jardno

Cultural history of the complicated relationship between the United States and Latin American and Caribbean countries, from Haitian independence in 1798 to the present. Themes include imperialism, political economy, tourism, migration, and ideologies of gender, race, and nation. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 022a, What History Teaches** John Gaddis

An introduction to the discipline of history. History viewed as an art, a science, and something in between; differences between fact, interpretation, and consensus; history as a predictor of future events. Focus on issues such as the interdependence of variables, causation and verification, the role of individuals, and to what extent historical inquiry can or should be a moral enterprise. WR, HU

\* **HIST 031b, Political Islam** Julia Stephens

A historical introduction to Islamic law and debates in Islamic political thought from the Prophet to the Arab Spring. Different interpretations of Islamic law, the formation of Muslim empires, European colonialism, nationalist movements, jihad, and the role of religion in contemporary politics in Pakistan, Egypt, Malaysia, Iran, Europe, and the United States. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 038b, The Mongols in China** Valerie Hansen

Non-Chinese peoples in China who preceded Chinggis Khan's unification of the nomads in 1206. The rise of non-Chinese dynasties beginning in the early tenth century; reasons for their success; the legacy of the Mongols from the fall of their empire in China to the early twentieth century. Extensive use of primary sources. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

History: Preindustrial

\* **HIST 039b / SAST 020b, Mumbai: Life in a Megacity** Rohit De

Mumbai as a case study for the transformations brought by urbanization and modernity in Asia. Focus on how Mumbai's residents and its planners navigated the challenges of living in a rapidly growing cosmopolitan city and reflected it in their art and ideas. Themes include capitalism, globalization, British empire, religious pluralism, radical politics, organized crime, and Bollywood. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 041a, The Americas in the Age of Revolutions** Marcela Echeverri Munoz

The connections, contrasts, and legacies of revolutions in the British, French, and Spanish Atlantic empires in the eighteenth and nineteenth centuries. Interactions between liberalism, black politics and antislavery, indigenous autonomy and citizenship, and revolutions in the Atlantic world between the 1760s and 1880s. Topics include the foundations of the Atlantic empires, strands of anticolonialism across the Americas, social aspects of the revolutionary movements, abolitionism and emancipation processes, and relations between the emergent American nations. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 042a, Oil and Empire** Rosie Bsheer

The political and social history of oil since the late nineteenth century, including global trends and processes. Oil's impact on the rise and fall of empires and the fates of nation-states; its role in war and its impact on social and cultural life. Focus on the Middle East, with some attention to Venezuela, Indonesia, and the Niger Delta. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HLTH 081a, Current Issues in Medicine and Public Health** Robert Bazell

Analysis of issues in public health and medicine that get extensive media attention and provoke policy debates. Topics include vaccination, the value of cancer screening and genetic testing, determinants of a healthy lifestyle, the U.S. role in global health, and the cost of health care. Enrollment limited to freshmen with a score of 4 or 5 on the Advanced Placement examination in Biology or the equivalent. Preregistration required; see under Freshman Seminar Program.

\* **HUMS 076a / HSHM 007a, Epidemics in Global Perspective** William Summers

Interaction of epidemic diseases and society. The response of government, medicine, and the public to the threat or actual presence of widespread contagious diseases. The notion of major epidemics as one of the key contingencies of history, critically examined through contemporary medical, political, and literary accounts. The changing responses of societies and governments to epidemics as well as the reasons for those responses. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU, SO

\* **HUMS 078a, Shakespeare and Music** Judith Malafronte

The use of music in Shakespeare's plays, from the original stagings and seventeenth-century adaptations to modern productions. Consideration of operatic versions of the plays from the nineteenth, twentieth, and twenty-first centuries. Includes a field trip to New York City. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **HUMS 092b / RLST 012b, Divine Law in Historical Perspective** Christine Hayes

The relationship between the concepts of religion and law in classical Jewish and Christian thought. Law as a religious expression, a concession to human weakness, or a debasement of the divine-human relationship; reasons for obeying religious and secular law; the relation of law and morality; the impact of historical theological debates over the law's spirit vs. its letter on contemporary, secular legal arguments concerning the value of law. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

**LITR 017a, Western Drama and Theater from 1400 to the Present** Jan Hagens

Close reading of exemplary dramas in the Western tradition from the late medieval period to the present, with some attention to critical texts about the history of Western drama. Changing conceptions of what a play is and does; drama's developing theatrical context; underlying world views. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **MB&B 050a, Topics in Cancer Biology** Sandy Chang

Introduction to cancer as a genetic disease, with a focus on major discoveries in cancer biology that offer mechanistic insights into the disease process. A brief history of cancer; influence of the genomic revolution on cancer diagnostics; molecular defects underlying specific cancers; current and future cancer therapeutics. Patient case studies highlight specific molecular pathways and treatment strategies. Enrollment limited to freshmen with a strong background in biology and/or chemistry, typically demonstrated by a score of 4 or 5 on Advanced Placement examinations. Preregistration required; see under Freshman Seminar Program. SC

\* **MCDB 040b, The Science and Politics of Cancer** Robert Bazell

Fundamentals of cell biology, Darwinian evolution, immunology, and genetics that underlie cancer; the history of cancer science and treatment; historical and current policy issues. Prerequisite: a score of 5 on the Advanced Placement test in Biology or equivalent. Enrollment limited to freshmen; preregistration required. May not be taken after CSSY 290. SC

\* **MCDB 050a, Immunology and Microbes** Paula Kavathas

Introduction to the immune system and its interaction with specific microbes. Attention both to microbes that cause illness, such as influenza, HIV, and HPV, and to microbes that live in harmony with humans, collectively called the microbiome. Readings include novels and historical works on diseases such as polio and AIDS. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SC RP

\* **MGRK 001b / CLCV 008b / HUMS 074b / LITR 091b / RSEE 008b, Western Visions of Greece** George Syrimis

Literary, philosophical, political, and aesthetic categories used by Western cultures since the Enlightenment to construct the concepts "Hellenic" and "ancient Greece." The refiguring of ancient Greek civilization as an ideal cultural template, symbolic origin, and philosophical reflection for both European philhellenes and contemporary Greeks. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **MGRK 002a / HUMS 051a / RLST 016a, Religion and Literature: Irreverent Texts**

George Syrimis and Hindy Najman

The complex relationship between religion and literature from the nineteenth century to the present. Focus on the Greco-Roman and Judeo-Christian traditions. Modernity and tradition, the legitimacy of ritual, the relationship between church and state, and the reception of antiquity. The emergence of modern discourses of gender and sexuality in light of religious practice and dogma. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **MUSI 009a, Jazz and Architecture** Michael Veal

A conceptual and structural comparison between modern jazz and modern architecture after World War II, focusing on recent experimental currents in each discipline. Effects of digital technology on both sonic and architectural practices. Form, structure, and material used in free jazz; processes in contemporary architecture that can be compared with those in modern jazz. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **MUSI 010b / HUMS 050b, Music and Diplomacy** Rebekah Ahrendt

The history of music in cultural diplomacy, with a focus on theoretical frameworks that grew up around musical practices as a result of music's diplomatic functions. Scores, instruments, and performers mobilized in the service of diplomacy; the influence of past practices on contemporary policy; state-sponsored musical tours; diplomatic patronage; universal vs. national music, including the use of such labels to further diplomatic goals. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **MUSI 012a, One Thousand Years of Love Songs** Anna Zayaruznaya

History of the love song in Western culture from the twelfth-century troubadours to contemporary popular hits. Music and the shifting social constructions of desire over the past millennium. The song repertory's engagement with ideas and movements such as courtly love, humanism, romanticism, sexual libertinism, and the LGBT rights movement. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU RP

\* **MUSI 030b, Faith and Doubt in Western Music** Henry Parkes

An exploration of spirituality, ideology, and philosophical worldviews in the great works of Western classical music. Religious and philosophical backgrounds of famous composers; the role of spirituality as a stimulus for creativity; the manner in which belief has shaped the reception of composers and works; the degree to which musical works communicate spiritual ideas or philosophies. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **NELC 001b / ARCG 001b, Egypt and Northeast Africa: A Multidisciplinary Approach** John Darnell

Examination of approximately 10,000 years of Nile Valley cultural history, with an introduction to the historical and archaeological study of Egypt and Nubia. Consideration of the Nile Valley as the meeting place of the cultures and societies of northeast Africa. Various written and visual sources are used, including the collections of the Peabody Museum and the Yale Art Gallery. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

WR, HU

\* **PHIL 084b, Philosophy and Psychology of Emotion** David Charles

Introduction to the interdisciplinary study of emotions, with a focus on philosophical works from antiquity to the present and on modern psychological and neuroscientific perspectives. The definition of emotions and their relation to reason, experience, and mood. The possibility of a general theory of the emotions. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **RLST 015b, Gods and Heroes in Indian Religions** Phyllis Granoff

The basic doctrines and practices of India's three classical religions, Buddhism, Jainism, and Hinduism, explored through close reading of texts in translation. Lives of the founders, great monks, nuns, and lay followers of Buddhism and Jainism; myths of the major Hindu gods; heroines and goddesses in the three traditions. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **SCIE 030a and SCIE 031b, Current Topics in Science** Douglas Kankel

A series of modules in lecture and discussion format addressing scientific issues arising in current affairs. Topics are selected for their scientific interest and contemporary relevance, and may include global warming, human cloning, and the existence of extrasolar planets. Credit for SCIE 030 only on completion of SCIE 031; one course credit is awarded for successful completion of the year's work. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SC  
½ Course cr per term

\* **SOCY 086a, Chinese Society since Mao** Deborah Davis

An overview of the major social institutions in contemporary China, with a focus on the changing relationship between individual and society. Use of print and visual sources to explore the social consequences of China's recent retreat from socialism and its rapid integration into the global economy. May count toward the Sociology major as an intermediate course. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO

\* **SPAN 060a, Freshman Colloquium: Literary Studies in Spanish** Susan Byrne

Introduction to the study of literature in general and to some of the most important texts in Hispanic literature. Selected texts in Spanish include short stories, essays, lyric, and theater. Open to students who have placed into L5 courses. Counts toward the requirements of the Spanish major with permission of the director of undergraduate studies. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. L5, HU

\* **WGSS 032b, History of Sexuality** Maria Trumpler

Exploration of scientific and medical writings on sexuality over the past century. Focus on the tension between nature and culture in shaping theories, the construction of heterosexuality and homosexuality, the role of scientific studies in moral discourse, and the rise of sexology as a scientific discipline. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

## Geology and Geophysics

Director of undergraduate studies: David Evans, 210 KGL, 432-3127,  
david.evans@yale.edu; earth.yale.edu

## FACULTY OF THE DEPARTMENT OF GEOLOGY AND GEOPHYSICS

**Professors** Jay Ague, David Bercovici (*Chair*), Ruth Blake, Mark Brandon, Derek Briggs, Peter Crane, David Evans, Alexey Fedorov, Debra Fischer, Jacques Gauthier, Thomas Graedel, Shun-ichiro Karato, Jun Korenaga, Mark Pagani, Jeffrey Park, Danny Rye, Brian Skinner, Ronald Smith, Elisabeth Vrba, John Wettlaufer

**Assistant Professors** Hagit Affek, William Boos, Kanani Lee, Maureen Long, Trude Storelvmo, Mary-Louise Timmermans, Nadine Unger, Zhengrong Wang

**Lecturers** Michael Oristaglio, Frank Robinson, Lawrence Schwartz, Catherine Skinner, Ellen Thomas

The Geology and Geophysics program prepares students for the application of scientific principles and methods to the understanding of Earth, the environment, and life on a regional and a planetary scale. Subjects range from the history of Earth and life to present-day environmental processes, integrating the study of Earth's deep interior, tectonic plates, oceans, atmosphere, climate, land surface, natural resources, and biota. The emphasis of the curriculum is on employing basic principles from the core sciences (physics, chemistry, biology) to further an understanding of Earth's past and present, and addressing issues relating to its future. Students gain a broad background in the natural sciences, and also select a specific track to focus their work on planetary or environmental phenomena of particular interest. The B.S. tracks emphasize hands-on research experience in fieldwork, in laboratories, or in computer modeling. While some graduates continue on to research, consulting, or industrial careers in Earth, environmental, and planetary sciences, the major's broad scientific training prepares students for a wide variety of other paths, including medicine, law, public policy, and teaching.

**B.S. degree program** Majors in the B.S. program in Geology and Geophysics choose from four tracks: atmosphere, ocean, and climate; environmental and energy geoscience; paleontology and geobiology; and solid Earth science. The tracks are suggested pathways to professional careers and major areas of research in geology and geophysics. Students may change tracks during their course of study with guidance from the director of undergraduate studies.

1. The atmosphere, ocean, and climate track provides a comprehensive understanding of the theory, observation, and prediction of the atmosphere-ocean-climate system. Topics range from past climate changes, including the ice ages, to present-day storms and weather, to forecasting climate change and global warming. The prerequisites are college-level chemistry (CHEM 112, 113; 114, 115; or 118), physics (PHYS 180, 181 and PHYS 165L, 166L), computing (ENAS 130 or equivalent), and mathematics through differential equations (MATH 120 or ENAS 151, and ENAS 194). The major requirements consist of at least eleven term courses, for ten and one-half course credits, beyond the prerequisites, including either the senior essay or the senior thesis. To begin study of Earth processes, majors take an introductory course in G&G, with any accompanying laboratory, selected from G&G 100; 110 or 115, and 111L; 120; or 125 and 126L. A higher-level course in G&G can be substituted with the permission of the director of undergraduate studies. Six core courses, totaling five and one-half course credits, introduce students to Earth's climate system (G&G 140 and 141L), meteorology (G&G 322), physical

oceanography (G&G 335), fluid mechanics (MENG 361), and statistics or linear algebra (STAT 230 or 238 or MATH 222). Three electives are chosen from topics in the environment and in processes that govern the atmosphere, ocean, and land surface; physics; and statistics. A list of suggested electives is available from the office of the director of undergraduate studies or on the departmental Web site (<http://earth.yale.edu/academics/undergraduate-program>). At least one elective must be from G&G.

2. The environmental and energy geoscience track provides a scientific understanding of the natural and anthropogenic processes that shape the Earth-atmosphere-biosphere system, including energy and material flows among its components. It emphasizes comparative studies of past and current Earth processes to inform models of humankind's role within the environment's future. The prerequisites are broad and flexible and include college-level chemistry (CHEM 112, 113; 114, 115; or 118) and mathematics through multivariate calculus (MATH 120 or ENAS 151). Depending on their area of focus, students may choose a prerequisite in physics (PHYS 170, 171; 180, 181; or 200, 201), or they may choose cellular biology (BIOL 101 and 102, or MCDB 120) and evolutionary biology (BIOL 103 and 104, or E&EB 122, or G&G 125 and 126L). The major requirements consist of at least eleven term courses, for eleven course credits, beyond the prerequisites, including either the senior essay or the senior thesis. To begin study of the Earth system, majors take two introductory courses in G&G, with any accompanying laboratories, selected from G&G 100; 110 or 115, and 111L; 120; or 140 and 141L (G&G 125 and 126L may count toward this requirement if not selected as the evolutionary biology prerequisite). Higher-level courses in G&G can be substituted with the permission of the director of undergraduate studies. Four core courses are chosen from topics in general resource use and sustainability (G&G 205), the microbiology of surface and near-surface environments (G&G 255), fossil fuels and energy transitions (G&G 274), renewable energies (G&G 275), geochemical principles (G&G 301), climate physics (G&G 322), and satellite-based image analysis (G&G 362). Four electives chosen from Geology and Geophysics, Environmental Studies (p. 302), Ecology and Evolutionary Biology (p. 239), engineering, or related fields provide a broad approach to scientific study of the environment. A list of suggested electives is available from the office of the director of undergraduate studies or on the departmental Web site (<http://earth.yale.edu/academics/undergraduate-program>). Electives may be chosen from the core courses, and at least two must be from G&G.
3. The paleontology and geobiology track focuses on the fossil record of life and evolution, geochemical imprints of life, and interactions between life and Earth. Topics range from morphology, function, relationships, and biogeography of the fossils themselves, through the contexts of fossil finds in terms of stratigraphy, sediment geochemistry, paleoecology, paleoclimate, and geomorphology, to analysis of the larger causes of paleontological, geobiological, and evolutionary patterns. Integrative approaches are emphasized that link fossil evidence with the physical and chemical evolution of Earth. The prerequisites are college-level biology (BIOL 101–104; or MCDB 120 and E&EB 122) and chemistry (CHEM 112, 113; 114, 115; or 118), and mathematics through multivariate calculus (MATH 120 or ENAS 151). The major requirements consist of at least thirteen term courses, for twelve course credits, beyond the prerequisites, including either the senior essay

- or the senior thesis. Students take G&G 110 or 115, and 111L, to gain geological and environmental context, and they are introduced to the fossil record and evolution in G&G 125 and 126L; higher-level courses in G&G can be substituted with the permission of the director of undergraduate studies. Four core courses give majors a comprehensive background in sedimentary rocks and rock correlation (G&G 230 or equivalent), the study of evolution (G&G 250), microbiology in past and present environments (G&G 255), and statistical data analysis as applied to the life sciences (STAT 101). Four electives selected from Geology and Geophysics, Ecology and Evolutionary Biology (p. 239), Molecular, Cellular, and Developmental Biology (p. 521), and related fields offer students flexibility in pursuing their specific interests. A list of suggested electives is available from the office of the director of undergraduate studies or on the departmental Web site (<http://earth.yale.edu/academics/undergraduate-program>). At least one elective must be from G&G.
4. The solid Earth science track emphasizes an integrated geological, geochemical, and geophysical approach to the study of processes operating within Earth and their manifestation on the surface. It includes the structure, dynamics, and kinetics of Earth's interior and their impacts on our environment both in the long term (e.g., the evolution of the land surface) and in the short term (e.g., the causes for natural disasters such as earthquakes, tsunamis, and volcanic eruptions). Students acquire a fundamental understanding of the solid Earth system, both as it exists today and as it has evolved over geologic time scales. The prerequisites are college-level chemistry (CHEM 112, 113; 114, 115; or 118) and physics (PHYS 170, 171; 180, 181; or 200, 201), and mathematics through multivariate calculus (MATH 120 or ENAS 151). The major requirements consist of at least eleven courses, for eleven course credits, beyond the prerequisites, including either the senior essay or the senior thesis. To begin study of the Earth system, majors take two introductory courses in G&G, with any accompanying laboratories, selected from G&G 100; 110 or 115, and 111L; 120; 125 and 126L; or 140 and 141L. Higher-level courses in G&G can be substituted with the permission of the director of undergraduate studies. The core of the track consists of four courses chosen from topics in mantle dynamics, earthquakes, and volcanoes (G&G 201), mountain building and global tectonics (G&G 212), rocks and minerals (G&G 220), sedimentary rocks and processes (G&G 230 or equivalent), and geochemical principles (G&G 301). Students also select four electives in geology, geochemistry, geophysics, or related topics. A list of suggested electives is available from the office of the director of undergraduate studies or on the departmental Web site (<http://earth.yale.edu/academics/undergraduate-program>). Electives may be chosen from core courses, and at least two must be from G&G.

**B.A. degree program** The B.A. degree in Geology and Natural Resources requires fewer upper-level courses than the B.S. degree. It may be more appropriate for students who wish to major in two separate Yale programs, who study geoscience in preparation for a career in law, business, government, or environmental fields, or who decide to pursue a science major only after the freshman year. The prerequisites include mathematics (MATH 115), biology (BIOL 101 and 102, or MCDB 120, or G&G 255), and chemistry (CHEM 103; 112, 113; 114, 115; or 118). The major requirements consist of at least nine term courses beyond the prerequisites. These include two courses in G&G numbered 100–150, with any accompanying laboratories; courses in natural resources



(G&G 205) and geochemistry (G&G 301); and five additional courses at the 200 level or higher in Geology and Geophysics or related fields, approved by the director of undergraduate studies and including either the senior essay or the senior thesis. Course selections can be guided by any of the B.S. tracks described above.

**Senior requirement** Seniors in both degree programs must prepare either a senior essay based on one term of library, laboratory, or field research (G&G 492) or, with the consent of the faculty, a two-term senior thesis (G&G 490, 491), which involves innovative field, laboratory, or theoretical research. Students electing to do a senior thesis must first select a topic and obtain the consent of a faculty member to act as an adviser. They must then petition the faculty through the director of undergraduate studies for approval of the thesis proposal. The petition should be submitted by the end of the junior year. If the two-term senior thesis is elected, G&G 491 may count as an elective toward the major. A copy of each senior thesis or senior essay is made available on the departmental Web site (<http://earth.yale.edu>).

Geology and Geophysics majors may not employ the Credit/D/Fail option for their prerequisites or for courses in the major. With permission of the director of undergraduate studies, acceleration credits awarded on entrance for high scores on national or international examinations (e.g., AP subject tests) may be used to satisfy prerequisites, even if the student does not choose to accelerate. Higher-level courses may, with the permission of the director of undergraduate studies, be substituted for prerequisites and for specific required courses. Qualified juniors and seniors are encouraged to enroll in graduate courses, with the permission of the instructor and of the directors of graduate and undergraduate studies. Descriptions of graduate courses are available at the office of the director of undergraduate studies.

**Practical experience** In addition to prerequisites and required courses in Geology and Geophysics, candidates for the B.A. and B.S. degrees are strongly encouraged to gain practical experience in the Earth sciences. This can be done in two ways: (1) by attending a summer field course at another academic institution, or (2) by participating in summer research opportunities offered by the Department of Geology and Geophysics, by other academic institutions, or by certain government agencies and private industries. Consult the director of undergraduate studies or see the departmental Web site (<http://earth.yale.edu>) for further information.

**Physics and Geosciences major** The Department of Geology and Geophysics also offers a combined major with the Department of Physics. For more information, see under Physics and Geosciences (p. 573).

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** *B.A.* – MATH 115; BIOL 101 and 102, or MCDB 120, or G&G 255; CHEM 103, or 112, 113, or 114, 115, or 118; *B.S.* – *All tracks* – CHEM 112, 113, or 114, 115, or 118; MATH 120 or ENAS 151; *Atmosphere, ocean, and climate track* – ENAS 130 or equivalent; ENAS 194; PHYS 180, 181, 165L, 166L; *Environmental and energy geoscience track* – physics (PHYS 170, 171, or 180, 181, or 200, 201) or biology (BIOL 101 and 102, or MCDB 120; and BIOL 103 and 104, or E&EB 122, or G&G 125 and 126L); *Paleontology and geobiology track* – BIOL 101–104, or MCDB 120 and E&EB 122; *Solid Earth science track* – PHYS 170, 171, or 180, 181, or 200, 201

**Number of courses** *B.A.* – at least 9 courses beyond prereqs for letter grades (incl senior req); *B.S. – Atmosphere, ocean, and climate track* – at least 11 courses, for 10½ credits, beyond prereqs for letter grades (incl senior req); *Environmental and energy geoscience and solid Earth science tracks* – at least 11 courses beyond prereqs for letter grades (incl senior req); *Paleontology and geobiology track* – at least 13 courses, for 12 credits, beyond prereqs for letter grades (incl senior req)

**Specific courses required** *B.A.* – G&G 205, 301; *B.S. – Atmosphere, ocean, and climate track* – G&G 140, 141L, 322, 335; MENG 361; STAT 230 or 238 or MATH 222; *Environmental and energy geoscience track* – 4 from G&G 205, 255, 274, 275, 301, 322, 362; *Paleontology and geobiology track* – G&G 110 or 115, 111L, 125, 126L, 230 or equivalent, 250, 255, STAT 101; *Solid Earth science track* – 4 from G&G 201, 212, 220, 230 or equivalent, 301

**Distribution of courses** *B.A.* – 2 intro courses in G&G, with labs, as specified; 5 addtl courses at 200 level or higher in G&G or related fields; *B.S. – Atmosphere, ocean, and climate track* – 1 intro course in G&G, with lab, as specified; 3 electives as specified; *Environmental and energy geoscience and solid Earth science tracks* – 2 intro courses in G&G, with labs, as specified; 4 electives as specified; *Paleontology and geobiology track* – 4 electives as specified

**Substitution permitted** *All programs* – with DUS permission, higher-level courses for prereqs or required courses

**Senior requirement** *All programs* – senior essay (G&G 492) or, with permission of faculty, two-term senior thesis (G&G 490, 491)

## Courses

### \* G&G 010a / EVST 010a, Earth, Resources, Energy, and the Environment

David Evans

Humankind's interactions with, and place within, the natural world. Plate tectonics and natural disasters, biological evolution and mass extinction, human evolution, population growth and ecology, industrial resources, groundwater and pollution, fossil fuels and energy transitions, the carbon cycle and greenhouse gases, paleoclimates, current global warming, alternative energies, and a planetary perspective on the Earth as a singular oasis in space. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SC

### \* G&G 105a / APHY 100a / ENAS 100a / EVST 100a / PHYS 100a, Energy Technology and Society

Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non-science majors with strong backgrounds in math and science. Enrollment limited to 24. For application instructions, visit the course site on Classes\*v2 (<http://classesv2.yale.edu>). QR, SC

### G&G 110a, Dynamic Earth

Danny Rye

An introduction to the processes that shape Earth's environment through the interactions of rocks, soils, the atmosphere, and the hydrosphere. Field trips and practical sessions in the properties of natural materials. Topics include evolution of landscapes; hydrologic and tectonic cycles; extreme geologic events such as earthquakes, floods, volcanism, and landslides; society's economic dependence on

natural materials such as soils, minerals, and fossil fuels; and human influences on the natural environment. SC

**G&G 111La, Dynamic Earth Laboratory and Field Methods** David Evans

Practical exercises in the laboratory and in the field to complement G&G 110 or 115. Identification of minerals and rocks; construction of geologic maps and cross sections to determine Earth-system processes and histories. Includes a field trip to the northern Appalachians during the October recess. After or concurrently with G&G 110, or after G&G 115. SC ½ Course cr

\* **G&G 115b / EVST 200b, Earth System Science** Jeffrey Park

A survey of geoscience. Interaction of lithosphere, hydrosphere, atmosphere, and Earth's deep interior; natural controls on environment and climate in past, present, and future; rocks, minerals, glaciers, earthquakes, and volcanoes; natural hazards and natural resources. (Formerly G&G 200) SC

\* **G&G 125b / E&EB 125b, History of Life** Pincelli Hull

Examination of fossil and geologic evidence pertaining to the origin, evolution, and history of life on Earth. Emphasis on major events in the history of life, on what the fossil record reveals about the evolutionary process, on the diversity of ancient and living organisms, and on the evolutionary impact of Earth's changing environment. SC

**G&G 140a / EVST 201a, Atmosphere, Ocean, and Environmental Change**

Ronald Smith

Physical processes that control Earth's atmosphere, ocean, and climate. Quantitative methods for constructing energy and water budgets. Topics include clouds, rain, severe storms, regional climate, the ozone layer, air pollution, ocean currents and productivity, the seasons, El Niño, the history of Earth's climate, global warming, energy, and water resources. Must be taken concurrently with EVST 202L. QR, SC

\* **G&G 141La / EVST 202La, Laboratory for Atmosphere, Ocean, and Environmental Change** Ronald Smith

Laboratory and field exercises to accompany EVST 201. Must be taken concurrently with EVST 201. SC ½ Course cr

\* **G&G 205b, Natural Resources and Their Sustainability** Jay Ague

The formation and distribution of renewable and nonrenewable energy, mineral, and water resources. Topics include the consequences of extraction and use; depletion and the availability of substitutes; and economic and geopolitical issues. Recommended preparation: introductory chemistry and geology. SC

\* **G&G 212b, Global Tectonics** David Evans

The architecture of continents and oceans; detailed geology of lithospheric plate margins and mountain chains. Examples of plate-interaction histories from the ancient geological record emphasize the interdisciplinary approaches used to determine interlinked Earth-system processes involving the mantle, crust, hydrosphere, atmosphere, and biosphere. The course features a field trip during spring break. Prerequisite: one course in G&G (preferably 100, 110, or 115), or permission of instructor. Enrollment limited to 15. SC

\* **G&G 215a, Global Warming: The Carbon Cycle** Hagit Affek

Discussion of classic and recent papers that describe the development of the scientific understanding of the fate of carbon in the atmosphere and its influence on the climate

system. Links between greenhouse gases and climate in the modern day and near future, as well as what can be learned from the geological past. Prerequisite: high school chemistry or physics.

**G&G 220b, Petrology and Mineralogy** Danny Rye

Comprehensive study of the structures, chemistry, and physical properties of minerals. Interpretation of mineral associations and textures in terms of processes acting in the formation of igneous and metamorphic rocks. Study of the interplay between plate tectonics and the genesis of igneous and metamorphic rocks. After one year of college-level chemistry; G&G 110 recommended. SC

**G&G 235a, Geomorphology and Surface Processes** Mark Brandon

Introduction to geologic processes that shape the Earth's surface, including erosion and deposition caused by rivers, glaciers, wind, and waves. Interaction between these surface processes and the Earth's climate system. QR, SC

**\* G&G 240b, Forensic Geoscience** Maureen Long

Approaches and technologies developed for geoscience that have been adapted and applied in criminal, environmental, historical, and archaeological investigations. Methods related to seismology, geophysics, geomorphology, geochemistry, and radiometric dating. Case studies include nuclear treaty verification, detection of unexploded ordnance and clandestine graves, military history, soil and groundwater contamination, archaeological controversies, art and antiquities fraud, and narcotics provenance. SC

**G&G 247b / AMTH 247b / MATH 247b, Partial Differential Equations** Igor Frenkel

Introduction to partial differential equations, wave equation, Laplace's equation, heat equation, method of characteristics, calculus of variations, series and transform methods, and numerical methods. Prerequisites: MATH 222 or 225, MATH 246, and ENAS 194, or equivalents. QR

**[ G&G 255, Environmental Geomicrobiology ]**

**\* G&G 261a / EVST 261a / F&ES 261a, Minerals and Human Health** Ruth Blake

Study of the interrelationships between Earth materials and processes and personal and public health. The transposition from the environment of the chemical elements essential for life. After one year of college-level chemistry or with permission of instructor; G&G 110 recommended. SC

**\* G&G 274a, Fossil Fuels and Energy Transitions** Michael Oristaglio

The origins, geologic settings, exploration, distribution, and extraction of fossil fuels as finite Earth resources. Energy use today; transitions to future renewable resources. Topical issues include peak oil, deep-water exploration, carbon sequestration, and shale gas. Prerequisites: high school chemistry, mathematics, and Earth science. Recommended preparation: G&G 110 or 205. SC

**\* G&G 275b, Renewable Energy** Ronald Smith

Introduction to renewable energy, including physical principles, existing and emerging technologies, and interaction with the environment. Energy demand; transmission and storage; generation by hydroelectric, wind, solar, biofuel, and geothermal sources, as well as waves and tidal generation. Includes field trips to conventional, hydroelectric, and wind power facilities in Connecticut. Prerequisites: high school physics, chemistry,

and mathematics; college-level science, engineering, and mathematics recommended.  
SC

**G&G 280a, Organic Geochemistry** Mark Pagani

Introduction to organic geochemistry and its applications in environmental reconstruction. Basic concepts of molecular chemistry and biochemistry, compound-specific carbon and hydrogen isotope distributions, and ancient temperature and carbon dioxide reconstruction. Prerequisite: CHEM 114 or equivalent. SC

[ **G&G 290, Earthquakes and Volcanoes** ]

[ **G&G 308, The Global Carbon Cycle** ]

**G&G 310a, Isotope Geochemistry** Zhengrong Wang

Fundamental principles of stable and radiogenic isotope geochemistry. Emphasis on applications to specific geologic problems, including petrogenesis, geochronology, geothermometry, surface processes, hydrology, and biogeochemistry. Prerequisites: CHEM 115, MATH 120, and PHYS 171 or equivalents, or with permission of instructor.  
QR, SC RP

**G&G 312b, Structure and Deformation of the Lithosphere** Mark Brandon

An introduction to the origin and structure of the lithosphere and continental and oceanic crust. Topics include what controls the solid versus fluid behavior of rocks during deformation, and what controls the character and motion of tectonic plates. Laboratory exercises and field trips. QR, SC

**G&G 319a, Introduction to the Physics and Chemistry of Earth Materials**

Shun-ichiro Karato

Basic principles that control the physical and chemical properties of Earth materials. Thermodynamics, equation of state, phase transformations, elastic properties and phase diagrams. After CHEM 115, MATH 120, and PHYS 181, or equivalents. QR, SC

\* **G&G 322a, Physics of Weather and Climate** William Boos

The climatic system; survey of atmospheric behavior and climatic change; meteorological measurements and analysis; formulation of physical principles governing weather and climate with selected applications to small- and large-scale phenomena. After PHYS 181 and MATH 120 or equivalents. QR, SC

**G&G 323b, Climate Dynamics** Alexey Fedorov

An introduction to climate dynamics. Special emphasis on phenomena controlled by large-scale interactions between the ocean and atmosphere, from El Niño to decadal climate variability. Topics include conceptual models of climate, general circulation of the atmosphere, ocean wind-driven and thermohaline circulation, abrupt climate changes, climate models by means of GCMs, and climate predictability. After PHYS 181, MATH 120 or equivalent, and one course in meteorology or physical oceanography; or with permission of instructor. QR, SC

**G&G 327a / ENVE 327a / F&ES 327a, Atmospheric Chemistry** Nadine Unger

The chemical and physical processes that determine the composition of the atmosphere; implications for climate, ecosystems, and human welfare. Origin of the atmosphere; photolysis and reaction kinetics; atmospheric transport of trace species; stratospheric ozone chemistry; tropospheric hydrocarbon chemistry; oxidizing power, nitrogen, oxygen, sulfur, and carbon cycles; interactions between chemistry, climate, and

biosphere; aerosols, smog, and acid rain. Prerequisites: CHEM 115 or 118, and MATH 120, or equivalents. ENAS 194 recommended. QR, SC

**G&G 335a, Physical Oceanography** Alexey Fedorov

An introduction to ocean dynamics and physical processes controlling large-scale ocean circulation, the Gulf Stream, wind-driven waves, tsunamis, tides, coastal upwelling, and other phenomena. Modern observational, theoretical, and numerical techniques used to study the ocean. The ocean's role in climate and global climate change. After PHYS 181 and MATH 120 or equivalents, or with permission of instructor. QR, SC

\* **G&G 362b / ARCG 362b / EVST 362b, Observing Earth from Space** Xuhui Lee

A practical introduction to satellite image analysis of Earth's surface. Topics include the spectrum of electromagnetic radiation, satellite-borne radiometers, data transmission and storage, computer image analysis, the merging of satellite imagery with GIS and applications to weather and climate, oceanography, surficial geology, ecology and epidemiology, forestry, agriculture, archaeology, and watershed management. Prerequisites: college-level physics or chemistry, two courses in geology and natural science of the environment or equivalents, and computer literacy. QR, SC

**G&G 428a / AMTH 428a / E&EB 428a / PHYS 428a, Science of Complex Systems**

Jun Korenaga

Introduction to the quantitative analysis of systems with many degrees of freedom. Fundamental components in the science of complex systems, including how to simulate complex systems, how to analyze model behaviors, and how to validate models using observations. Topics include cellular automata, bifurcation theory, deterministic chaos, self-organized criticality, renormalization, and inverse theory. Prerequisite: PHYS 301, MATH 247, or equivalent. QR, SC

**G&G 450b, Deformation of Earth Materials** Shun-ichiro Karato

Basic physics and chemistry of Earth materials, with emphasis on kinetic and transport properties. Geochemical and geophysical processes in Earth's crust and mantle and their influence on the dynamics and evolution of this planet. Topics include plastic flow, diffusion, electrical conductivity, and chemical reaction. Prerequisites: CHEM 115, MATH 120, and PHYS 181, or equivalents. QR, SC

**G&G 456a, Introduction to Seismology** Maureen Long

Earthquakes and seismic waves, P and S waves, surface waves and free oscillations. Remote sensing of Earth's deep interior and faulting mechanisms. Prerequisites: MATH 120, 222, and PHYS 181, or equivalents. QR, SC

[ **G&G 470, Cloud Physics and Dynamics** ]

\* **G&G 487a or b, Individual Study in Geology and Geophysics** David Evans

Individual study for qualified undergraduates under faculty supervision. To register for this course, each student must submit a written plan of study, approved by the adviser, to the director of undergraduate studies. May be taken more than once for credit. ½ Course cr

\* **G&G 488a and G&G 489b, Research in Geology and Geophysics** David Evans

Individual study for qualified juniors and seniors under faculty supervision. To register for this course, each student must submit a written plan of study, approved by the adviser, to the director of undergraduate studies.

**\* G&G 490a and G&G 491b, Research and Senior Thesis** David Evans

Two terms of independent library, laboratory, field, or modeling-based research under faculty supervision. To register for this course, each student must submit a written plan of study, approved by a faculty adviser, to the director of undergraduate studies by the end of the junior year. The plan requires approval of the full G&G faculty.

**\* G&G 492a or b, The Senior Essay** David Evans

One term of independent library, laboratory, field, or modeling-based research under faculty supervision. To register for this course, each student must submit a written plan of study, approved by a faculty adviser, to the director of undergraduate studies at the beginning of the term in which the essay is to be written.

## German Studies

Students in the Class of 2017 and subsequent classes who are considering a major in German Studies should refer to the program described under Germanic Languages and Literatures (p. 373). Students in the Class of 2016 and previous classes may complete the German Studies major as described in previous editions of this bulletin, or, with permission of the director of undergraduate studies, they may fulfill the requirements of the current German Studies major as described under Germanic Languages and Literatures (p. 373).

## Germanic Languages and Literatures

Director of undergraduate studies: Brigitte Peucker, 308 WLH, 432-0785, [brigitte.peucker@yale.edu](mailto:brigitte.peucker@yale.edu); language program director: Theresa Schenker, 325 WLH, 432-0783, [theresa.schenker@yale.edu](mailto:theresa.schenker@yale.edu); [german.yale.edu](http://german.yale.edu)

### FACULTY OF THE DEPARTMENT OF GERMANIC LANGUAGES AND LITERATURES

**Professors** Rüdiger Campe (*Chair*), Carol Jacobs, Rainer Nägele, Brigitte Peucker, Henry Sussman (*Visiting*)

**Associate Professors** Paul North, Kirk Wetters

**Lecturer** William Whobrey

**Senior Lector II** Marion Gehlker

**Senior Lectors** Theresa Schenker, Howard Stern

**Affiliated Faculty** Jeffrey Alexander (*Sociology*), Seyla Benhabib (*Political Science*), David Cameron (*Political Science*), Paul Franks (*Philosophy, Judaic Studies*), Karsten Harries (*Philosophy*), Patrick McCreless (*Music*), Steven Smith (*Political Science*), J. Adam Tooze (*History*), Katie Trumpener (*Comparative Literature, English*), Jay Winter (*History*), Christopher Wood (*History of Art*)

The major in German Studies covers a broad tradition of more than five centuries in Switzerland, Austria, Germany, and neighboring lands. Students gain deep competence in the German language while also reading great literature, analyzing distinctive artworks in many media, deducing intensive theories, and exploring political, linguistic,

and cultural history. The German faculty works closely with undergraduates to develop their special areas of interest within these rich currents of German culture.

Majors in German Studies gain a solid grounding in German language through courses that emphasize listening, speaking, reading, and writing in interaction with authentic cultural materials. The curriculum also introduces students to the basic questions and methods of literary criticism, with a focus on rigorous reading practices for a wide range of works from different genres, disciplines, and historical moments.

German Studies courses are diverse in their topics and highly relevant to other fields of study today. Pioneers in philosophy, political theory, sociology, psychology, history, classical philology, the visual arts, architecture, and music wrote and thought in German, as did founders of the modern natural and practical sciences. Majors discover Kant, Goethe, Beethoven, Einstein, Freud, Kafka, Arendt, and many other thinkers and writers who laid the groundwork for modernity and still hold keys to understanding it.

Germany is the third-largest economy in the world, and German is spoken by over 80 million people worldwide. Students with a foundation in the language, literature, history, and intellectual revolutions of Germany are prepared to enter a wide variety of vocations. Majors have gone on to postgraduate study in Germany and the United States, and many have entered top-tier law schools and graduate programs. Recent graduates work in fields as diverse as environmental policy, journalism, arts management, consulting, and engineering, as well as in governmental and nongovernmental organizations and businesses.

**Prerequisites** Prerequisite to the major are first- and second-year German or the equivalent.

**The major** The major in German Studies consists of ten term courses, including three advanced language courses, four courses in an area of concentration, and the senior essay. Students in the Class of 2016 or previous classes majoring in German or German Studies may complete the requirements of the major in place when they entered it, as described in previous editions of this bulletin, or, with approval of the director of undergraduate studies, they may complete the requirements of the German Studies major as described below.

All majors must complete one GMAN course numbered in the 150s, one in the 160s, and one in the 170s, plus four additional advanced courses taught in German or in translation. Four courses in an area of concentration must be numbered above GMAN 170. With permission of the director of undergraduate studies, two courses related to German literature from other departments may be substituted for two required courses.

**Areas of concentration** Each German Studies major selects an area of concentration from five possible choices: (1) literature, (2) media and media theory, (3) history and politics, (4) critical thought, and (5) aesthetics and the arts. The *literature* concentration gives students access to worlds of thought and action. Students learn to read critically poetry, novels, plays, short stories, aphorisms, songs, and other genres. Courses fulfilling the literature concentration include at least one course each in nineteenth- and twentieth-century literature and two advanced courses taught in German. The concentration in *media and media theory* explores a vibrant tradition of experimentation in new cultural forms and media in the nineteenth and twentieth centuries. Students



investigate photography, radio, film, television, and computer media alongside landmark works in media theory. The *history and politics* concentration focuses on world-altering historical events and thought-altering theories of history from the Germanic tradition. Students become familiar with explosive political and social events, including the emancipation of the Jews and the Holocaust, the world wars, unification and reunification, and concepts and models for development in economy, social welfare, law, and environmental policies. The concentration in *critical thought* focuses on traditions of theoretical reflection on society, history, art, and language. Students become familiar with authors such as Kant, Hegel, Marx, Nietzsche, Freud, Benjamin, and Habermas. The *aesthetics and the arts* concentration surveys the rich Germanic traditions in the visual and musical arts, as well as the philosophical study of art beginning in eighteenth-century Germany.

**Senior essay** Seniors in the standard German Studies major enroll in GMAN 492, a guided senior essay tutorial course. Students meet biweekly with the director of undergraduate studies and staff, and work under the direction of a faculty adviser. The culmination of the tutorial is an essay of approximately thirty pages that gives evidence of careful reading and substantial independent thought. The essay may be written in either English or German, although only native speakers are encouraged to write an essay in German. Seniors typically write the essay during the fall term. A preliminary statement indicating the general area to be addressed and the choice of adviser should be submitted to the director of undergraduate studies by September 5, 2014; a three-page prospectus and a bibliography are due by September 26. A rough draft must be submitted to the adviser by November 7. The completed essay, due on December 8, is judged by the faculty adviser and a second reader.

**Intensive Major** Requirements for the intensive major are the same as for the standard major, except that the intensive major replaces one advanced seminar with a second term of the senior essay. In the fall term seniors in the intensive major enroll in GMAN 492 and begin work on their project under the guidance and supervision of a faculty adviser. A significant portion of the research for the essay should involve materials in German. The essay may be written in either English or German, although only native speakers are encouraged to write an essay in German. A detailed prospectus, no longer than three pages, and a bibliography must be submitted to the director of undergraduate studies by October 20, 2014. The student must submit a draft of at least fifteen pages of the essay by December 5 to receive credit for the first term of the course. The second term, GMAN 493, is devoted to completing the essay, which should be substantial (between fifty and sixty pages); the completed essay must be submitted by April 11, 2015. The senior essay is judged by the faculty adviser and a second reader.

**Group A courses** Courses in Group A (GMAN 110–169) include elementary, intermediate, and advanced language courses.

**Group B courses** Courses in Group B (GMAN 170 and above) are advanced courses and count toward the major. Readings are in German, and the language of instruction is usually German.

**Group C courses** Courses in Group C are conducted in English with texts in translation.

Courses in the Graduate School are open to undergraduates with permission of the instructor and of the directors of undergraduate and graduate studies. Course descriptions may be obtained on the German Web site (<http://german.yale.edu>) or from the office of the director of graduate studies.

Candidates for the major in German Studies should consult the director of undergraduate studies.

**Study abroad** Students are strongly encouraged to study in Germany for a summer, or for one or two terms on the Year or Term Abroad program. Appropriate course credit toward the major is granted for work in approved programs in Germany. Study abroad is valuable not only for achieving comfortable fluency in German, but also for gaining firsthand knowledge of the German cultural context. The department offers diverse opportunities for study abroad and a scholarship program for summer courses at German universities. Members of the faculty advise and consult with any students wishing to plan study in Germany. Students who have been approved to study abroad and who receive financial aid from Yale are eligible for aid while abroad. For information about the Year or Term Abroad program, see section K, Special Arrangements (p. 63), in the Academic Regulations. Students who study abroad for a semester may count up to 2 courses toward the major, subject to approval by the director of undergraduate studies. Students who study abroad for an academic year may count up to 4 courses toward the major, subject to approval by the director of undergraduate studies.

**Placement** An online placement examination will be accessible July 1 through August 15, 2014. See the departmental Web site (<http://german.yale.edu/academics/undergraduate-program/language-program/placement-test>) for details. Students wishing to take the placement exam in January should sign up with the language director by December 5, 2014. Students may also consult with the director of undergraduate studies or the language director for advice about placement and about language study. Regardless of previous German study, students without a score of 5 on the German Advanced Placement test must take the departmental placement exam in order to enroll in any course above GMAN 110 or 125.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** First- and second-year German or equivalent.

**Number of courses** 10 (incl senior req)

**Distribution of courses** 1 GMAN course in the 150s, 1 in the 160s, and 1 in the 170s; 4 courses in area of concentration numbered above GMAN 170; 4 addtl advanced courses taught in German or in translation; *Literature concentration* – at least 1 course each in 19th- and 20th-century literature; 2 advanced courses taught in German

**Substitution permitted** With DUS approval, courses taken on Year or Term Abroad for other courses in major and up to two courses related to German literature from other departments

**Senior requirement** Senior essay tutorial (GMAN 492)

**Intensive major** Two-term senior essay (GMAN 492 and 493)

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## Group A Courses

### \* **GMAN 110a or b, Elementary German I** Staff

A beginning course in spoken and written German that combines oral practice and cultural awareness with a solid foundation in grammar and vocabulary. Listening comprehension through online audio exercises and in-class video clips. Topics include family and school life, German-speaking countries, short literary readings by Hesse, Goethe, and Wondratschek, popular music, and the feature film *Lola rennt*. Tutors are available for extra help or for advanced practice. To be followed by GMAN 120. Enrollment limited to 14 per section. Credit only on completion of GMAN 120. L1 RP 1½ Course cr

### **GMAN 120a or b, Elementary German II** Staff

Continuation of GMAN 110. Topics include German history, the environment, multicultural Germany, Austria, and Switzerland, popular music, a soap opera, and the feature film *Das schreckliche Mädchen*. Listening comprehension through online audio exercises and in-class video clips. Students read poems by Goethe and Jandl and short stories by Bichsel, Brecht, and Kafka. Tutors are available for extra help or for advanced practice. To be followed by GMAN 130. Enrollment limited to 14 per section. L2 RP 1½ Course cr

### **GMAN 125a, Intensive German I** Howard Stern

Intensive training in speaking, reading, writing, and comprehending the language. Focus on the mastery of formal grammar. For beginning students of superior linguistic ability. L1, L2 RP 2 Course cr

### **GMAN 130a or b, Intermediate German I** Staff

Builds on and expands knowledge acquired in GMAN 120. A content-based class that helps students improve their oral and written linguistic skills and their cultural awareness through texts and audiovisual materials relating to German literature, culture, history, and politics. Topics include German universities, Berlin or Frankfurt, Germany before and after the Berlin Wall, and interpersonal relationships. Course materials include online listening comprehension exercises, poems and short stories by Kafka, Brecht, Kästner, Schneider, and Kaschnitz, popular and classical music, and feature films. Tutors are available for extra help or for advanced practice. After GMAN 120 or according to placement examination. Followed by GMAN 140. Enrollment limited to 14 per section. L3 RP 1½ Course cr

### **GMAN 140a or b, Intermediate German II** Staff

Continuation of GMAN 130. Topics include multicultural Germany, globalization, pacifism, and music and politics. Readings include fiction and nonfiction texts by Celan, Kaminer, and Einstein and a full-length novel. Tutors are available for extra help or for advanced practice. After GMAN 130 or according to placement examination. Normally followed by GMAN 150 or, with permission of the director of undergraduate studies, by GMAN 171. Enrollment limited to 14 per section. L4 RP 1½ Course cr

### **GMAN 145b, Intensive German II** Howard Stern

Continuation of GMAN 125. Focus on speaking, writing, and the conversion of grammatical knowledge into reading competence for literary and scholarly purposes. Prerequisite: GMAN 125. L3, L4 RP 2 Course cr

\* **GMAN 150a or b, Advanced German I** Staff

An advanced language course intended to improve students' proficiency in aural and reading comprehension, as well as in speaking and writing. Discussion of literary texts by major German authors. Emphasis on vocabulary expansion with specialized grammatical review and a focus on stylistic development in students' writing. Recommended for students planning to use the language practically and as preparation for higher-level courses in both language and literature. After GMAN 140 or 145. For entering students with a score of 5 on the German Advanced Placement test, or according to results of the placement examination. L5

**GMAN 160b, German Culture, History, and Politics in Text and Film**

Theresa Schenker

An advanced language course focused on improving upper-level language skills through the discussion of selected aspects of post-1945 German culture, politics, and history in literary and nonliterary texts and film. Includes oral and written assignments with an emphasis on vocabulary building and increased cultural awareness. After GMAN 140, 145, or 150. L5

\* **GMAN 162a, Contemporary German Culture** Theresa Schenker

Analysis and discussion of current social and cultural trends. Topics drawn from newspapers, films, TV series, cabaret, short literary texts, and talks. Focus on oral and written production to improve upper-level linguistic skills. Prerequisite: GMAN 150, or with permission of instructor. May not be taken for credit after GMAN 168. L5, HU

## Group B Courses

\* **GMAN 172a, Introduction to German Theater** Nadine Schwakopf

An advanced language course that addresses key authors and works of the German theatrical tradition. Refinement of skills in reading comprehension, writing, and speaking. Authors include Lessing, Goethe, Schiller, Kleist, Büchner, Hebbel, Wedekind, Brecht, and Müller. L5, HU

\* **GMAN 173b, Introduction to German Lyric Poetry** Rainer Nägele

The German lyric tradition, including classic works by Goethe, Schiller, Hölderlin, Eichendorff, Heine, Mörike, Droste-Hülshoff, Rilke, George, Brecht, Trakl, Celan, Bachmann, and Jandl. Attention to the German *Lied* (art song). Development of advanced reading, writing, speaking, and translation skills. Prerequisite: GMAN 150 or equivalent. L5, HU

\* **GMAN 313a / LITR 319a, Eccentric Realism** Rainer Nägele

Reexamination of accepted concepts of "the real" through close readings of German nineteenth-century realist short stories and novellas by Keller, Stifter, and C. F. Meyer. Prerequisite: GMAN 150 or equivalent. HU

\* **GMAN 339b, The Nibelungenlied** William Whobrey

Close reading of the medieval *Nibelungenlied*, including selections in the original Middle High German. The manuscript tradition; other treatments of the text's heroic material; continuation of the epic in the *Klage*; reception of the text from the Middle Ages to the present. Prerequisite: reading knowledge of German. HU

## Group C Courses

Unless otherwise indicated, courses in this group are conducted in English with both readings and discussion in English. The courses are open to all students in Yale College.

\* **GMAN 050a / FILM 092a / HUMS 053a, Spectatorship and Visual Culture**

Brigitte Peucker

The position of the Western spectator from the eighteenth through the twentieth centuries in a variety of paradigmatic situations. Spectatorship in the contexts of landscape, painting, the city, and film. Looking and the imagination; the relation of the represented to the real; vision and the senses; the nature and politics of looking. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **GMAN 191b / LITR 334b, Problems of Lyric** Howard Stern

Masterpieces of European and American lyric studied in relation to the various determinants of poetry: grammar and logic, meter and rhyme, self-consciousness and performativity, myth and theme. Poets include Brecht, Rilke, Goethe, Frost, and Elizabeth Bishop. Reading knowledge of German or French useful but not required.

HU

**GMAN 209b / HIST 231b, War in Germany, 1648–2010** John Tooze

The rise and fall of modern militarism in Germany. Individual battles, soldiers, and weapons discussed within a broader context of the justification and regulation of state violence. Germany as a European battlefield, and as a nation that has perhaps come closest to drawing a final, concluding line under its military history. HU

\* **GMAN 210b / HUMS 322b, The Frankfurt School** Kirk Wetters

Major works of the Frankfurt school of social research explored in the context of twentieth-century social, psychological, political, literary, and aesthetic thought. HU

\* **GMAN 211a / HUMS 311a / PHIL 412a, Marx, Nietzsche, Freud** Rüdiger Campe

The revolutionary ways in which Marx, Nietzsche, and Freud redefined the ends of freedom. Key works of the three authors on agency in politics, economics, epistemology, social life, and sexuality. Agency as individual or collective, as autonomous or heteronomous, and as a case of liberation or subversion. Additional readings from Kant, Hegel, Kierkegaard, and Weber. HU

\* **GMAN 225b / FILM 346b / LITR 362b, Intermediality in Film** Brigitte Peucker

The relationship of film to theater and painting, with the suggestion that where two media are in evidence, there is usually a third. Topics include space, motion, color, theatricality, tableau vivant, ekphrasis, spectatorship, and new media. Readings feature art-historical and film-theoretical texts as well as essays pertinent to specific films. HU

\* **GMAN 226a / LITR 470a, Faust** Jan Hagens

The development of the Faust motif through time, from the legend's origins in the Renaissance-Reformation period to twentieth-century variations. Readings from the English adaptation of the original German chapbook, Marlowe's *Doctor Faustus*, Goethe's *Faust (Part I)*, and Thomas Mann's *Doctor Faustus*; screenings of films with a Faustian theme. HU

**GMAN 234a / LITR 244a, German Fairy Tales** Henry Sussman

The influence of German fairy tales on the genre of fiction and on the emergence of psychology, psychoanalysis, and folklore. The fairy tale's relation to romanticism; the importance of childhood sensibility to the fields of education, psychology, criticism, and cybernetics; the expansion of children's literature into new mass media. HU

**\* GMAN 240b / LITR 226b, German Modernism** Henry Sussman

Introduction to the radical innovations of modernism as it was forged, received, and revised in German-speaking Europe from c. 1880 to 1945. Literary experiments in dissonance and multifaceted suggestion; strategies in criticism and elucidation demanded by modernist works. Some attention to parallels in painting and music. Readings in English translation. Priority to German Studies majors. HU RP

**\* GMAN 247b / HUMS 227b / LITR 201b, Goethe's Wilhelm Meister** Kirk Wetters

A detailed study of Goethe's two Wilhelm Meister novels. *Wilhelm Meister's Apprenticeship* as the first novel of the nineteenth century and the prototypical novel of education (Bildungsroman); *Wilhelm Meister's Journeyman Years* as an unconventional sequel in which Goethe shows his unwillingness to repeat the model of his earlier breakthrough work. Readings and discussion in English. HU

**\* GMAN 268a / HUMS 262a / LITR 457a, W. G. Sebald** Carol Jacobs

Close readings of the major works of W. G. Sebald along with texts of other authors who played a direct role in these writings, including Thomas Browne, Grimmshausen, Kafka, and Heschel. Texts in relation to theory of literature in terms of memory, representation, identity, ethical imperatives, and intertextual and intermedia relations. HU

**\* GMAN 308a / LITR 439a, Rilke and Yeats** Carol Jacobs

Close readings of individual works by Rainer Maria Rilke and William Butler Yeats, with an eye to the theoretical implications of their writings. HU TR

**\* GMAN 327b / HUMS 287b, Around Kafka** Henry Sussman

Franz Kafka's writings viewed as a site for the radical questioning and dislocation of Western systems, institutions, and mores of the early twentieth century. Attention to the shorter fiction, the novels, the letters, and their strategic interrelations; examination of the fields of knowledge, ideological presumptions, and aesthetic and cultural experiments that Kafka touched, and to some degree deranged, with his writing. Group C courses are conducted in English with both readings and discussion in English, and are open to all students in Yale College. HU TR

**\* GMAN 380a / ER&M 280a / MUSI 380a, Music in Nazi Germany**

Gundula Kreuzer

The interrelations between music and politics under the extreme conditions of a totalitarian regime. How the National Socialists sought to police all aspects of Germany's musical life between 1933 and 1945 and why they often failed. Topics include aesthetic, political, and administrative prerequisites for the Nazis' efforts; consequences of Nazism for musical culture during the Third Reich and beyond; and the vulnerability of music to ideological appropriation.

\* **GMAN 408a / FILM 357a / LITR 304a, Books, Displays, and Systems Theory**

Henry Sussman

A status report on the book as a medium in an age of cybernetic technology and virtual reality. The contentious no-man's land between books and contemporary systems. HU

RP

## Reading Courses

\* **GMAN 100a and GMAN 101b, German for Reading** Staff

Students learn the skills with which to read German-language texts of any difficulty with some fluency. Study of syntax and grammar; practice in close reading and translation of fiction and expository prose in the humanities and sciences. Conducted in English. Does not satisfy the language distributional requirement.

## Senior Courses

\* **GMAN 478a or b, Directed Readings or Individual Research in Germanic Languages and Literatures** Staff

Individual study under faculty supervision. Applicants must submit a prospectus and bibliography approved by the faculty adviser to the director of undergraduate studies. The student meets with the adviser at least one hour each week and takes a final examination or writes a term paper. No credit granted without prior approval of the director of undergraduate studies.

\* **GMAN 492a and GMAN 493b, The Senior Essay Tutorial** Brigitte Peucker

Preparation of an original essay under the direction of a faculty adviser.

## Global Affairs

Director of undergraduate studies: Susan Hyde, 101 Horchow Hall, 432-3418;  
jackson.yale.edu/ba-degree

### FACULTY ASSOCIATED WITH THE PROGRAM OF GLOBAL AFFAIRS

**Professors** Julia Adams (*Sociology*), Elizabeth Bradley (*Public Health*), John Gaddis (*History*), Jeffrey Garten (*School of Management*), Jacob Hacker (*Political Science*), Oona Hathaway (*Law School*), Stathis Kalyvas (*Political Science*), Paul Kennedy (*History*), James Levinsohn (*Director*) (*School of Management*), Ellen Lust (*Political Science*), Catherine Panter-Brick (*Anthropology*), W. Michael Reisman (*Law School*), Susan Rose-Ackerman (*Political Science, Law School*), Peter Schott (*School of Management*), Ian Shapiro (*Political Science*), J. Adam Tooze (*History*), Aleh Tsyvinski (*Economics*), Christopher Udry (*Economics*), Steven Wilkinson (*Political Science*), Francis Wilson (*Visiting*), Elisabeth Wood (*Political Science*), Ernesto Zedillo (*Center for the Study of Globalization*)

**Associate Professors** Costas Arkolakis (*Economics*), Patrick Cohrs (*History*), Ana De La O (*Political Science*), Susan Hyde (*Political Science*), Kaveh Khoshnood (*Public Health*), Jason Lyall (*Political Science*), Mushfiq Mobarak (*School of Management*), Nancy Qian (*Economics*)

**Assistant Professors** David Atkin (*Economics*), Kate Baldwin (*Political Science*), Pia Rebello Britto (*Child Study Center*), Lorenzo Caliendo (*School of Management*), Alexandre Debs (*Political Science*), Lloyd Grieger (*Sociology*), Daniel Keniston

(*Economics*), Adria Lawrence (*Political Science*), Nuno Monteiro (*Political Science*), Thania Sanchez (*Political Science*), Tariq Thachil (*Political Science*), Jessica Weiss (*Political Science*), Jonathan Wyrzten (*Sociology*)

**Senior Lecturers** Charles Hill (*MacMillan Center*), Justin Thomas

**Lecturers** Jasmina Besirevic-Regan (*Sociology*), Michael Boozer (*Economics*), Leslie Curry (*Public Health*), Robert Hecht, Robert Hopkins, Matthew Kocher (*Political Science*), Jean Krasno, Douglas McKee (*Economics*), Michael Skonieczny (*Public Health*), Sean Smith, Bonnie Weir (*Political Science*), Edward Wittenstein

**Senior Fellows** David Brooks, Johnnie Carson, Howard Dean, Thomas Graham, Michele Malvesti, Stanley McChrystal, John Negroponte, Stephen Roach, Emma Sky

The Global Affairs major, administered by the Jackson Institute for Global Affairs, prepares Yale students for global citizenship and leadership by enhancing their understanding of the world around them. Students in this interdisciplinary major develop expertise in contemporary global affairs that is strongly grounded in the social sciences.

Most Global Affairs courses are open to both majors and nonmajors. If a Global Affairs course requires an application, the application will be posted on the Jackson Institute Web site (<http://jackson.yale.edu/courses-2>).

Students in the Global Affairs major concentrate their course work in one of two tracks. The international development track focuses on economic development and poverty, including global public health, in all but the world's wealthiest countries. The international security track focuses on international relations, foreign policy, and diplomacy and includes topics relevant to national and human security. All majors are required to take a core course in each track and complete at least five additional courses in a single track.

**Prerequisites** There are no prerequisites for the Global Affairs major. However, students interested in applying to the major are encouraged to complete the introductory economics courses and work toward the foreign language requirement early in their course planning.

**Requirements of the major** Twelve term courses are required for the major in addition to a foreign language requirement. Introductory courses in microeconomics (ECON 108, 110, or 115) and macroeconomics (ECON 111 or 116) are required for both tracks. All majors must take the core courses GLBL 225 and GLBL 275, and they must complete GLBL 121 prior to taking GLBL 225. Majors also take one research design course approved by the director of undergraduate studies.

Majors in the international development track take intermediate microeconomics (ECON 121 or 125) and four electives in their area of concentration. Those in the international security track take five electives in their area of concentration. Electives must be chosen from an approved group of courses in Global Affairs, History (p. 399), Political Science (p. 575), Economics (p. 247), and other social science departments. For information about which courses qualify as electives within each track, see the Jackson Institute Web site (<http://jackson.yale.edu/global-affairs-major>) and the course listings in this bulletin.



**Language requirement** Global Affairs majors are required to take a course designated L5 in a modern language other than English by the time of their graduation. In exceptional cases, a demonstration of proficiency will meet the requirement.

**Senior requirement** In the fall term of the senior year, majors must complete a capstone project in GLBL 499. For the project, small groups of students are each assigned to a policy task force in which majors apply their academic training in the social sciences to a specific problem relevant to global affairs. Each task force presents its findings and recommendations to a real-world client such as a government agency, a nongovernmental organization or nonprofit group, or a private-sector organization in the United States or abroad.

**Application to the major** Students apply to the Global Affairs major in the fall of the sophomore year. The number of students accepted into the major is limited, and selection is competitive. For application information, visit the Jackson Institute Web site (<http://jackson.yale.edu/admission>). Students interested in receiving the call for applications to the major should sign up for the Jackson Institute's electronic mailing list.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be applied to the requirements of the major, with the exception that a grade of Credit in an L5 language course may be used to demonstrate proficiency in a foreign language.

**Study abroad** Global Affairs majors who study abroad should consult the director of student affairs to devise a course of study prior to the term abroad.

**Internships** Students in the major are encouraged to take a summer internship in the field of global affairs after their junior year. The Jackson Institute's Career Services Office can help students find appropriate internships.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 (incl senior req; excluding lang req)

**Specific courses required** *Both tracks*—ECON 108, 110, or 115; ECON 111 or 116; GLBL 121, 225, 275; *International development track*—ECON 121 or 125

**Distribution of courses** *Both tracks*—1 course in research design; *International development track*—4 approved electives; *International security track*—5 approved electives

**Language requirement** Advanced ability (L5) in 1 modern lang other than English

**Senior requirement** Senior capstone project in GLBL 499

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## Courses

**GLBL 101a, Gateway to Global Affairs** Michele Malvesti

Introduction to critical thinking about current international issues. Guest lecturers lead a series of modules, each on a global affairs topic in their area of expertise. Students learn to frame policy questions and write policy memos while examining competing points of view. Topics vary from year to year. 50

Global Affairs: Security

Global Affairs: Development

**GLBL 121a or b, Applied Quantitative Analysis** Justin Thomas

Mathematical fundamentals that underlie analytical approaches in public policy and the social sciences. Development of mathematical skills in areas such as linear functions, single and multiple variable differentiation, exponential functions, and optimization. Statistical approaches include descriptive statistics, principles of sampling, hypothesis tests, simple linear regression, multiple regression, and models for analyzing categorical outcomes. QR

**\* GLBL 186b / AFST 389b / MMES 181b / PLSC 389b, Middle East Exceptionalism**

Adria Lawrence

The Middle East and North Africa in comparative perspective. Evaluation of claims that the region's states are exceptionally violent, authoritarian, or religious. Themes include gender, Islam, nation and state formation, oil wealth, terrorism, and war. SO  
Global Affairs: Research

**\* GLBL 189a / HLTH 325a / LAST 416a, Methods and Ethics in Global Health Research** Leslie Curry

Introduction to research methods in global health that recognize the influence of political, economic, social, and cultural factors. Quantitative, qualitative, and mixed-method approaches; ethical aspects of conducting research in resource-constrained settings; the process of obtaining human subjects' approval. Students develop proposals for short-term global health research projects conducted in resource-constrained settings. SO RP  
Global Affairs: Research

**\* GLBL 209a / EP&E 291a, Politics of Authoritarian Regimes** Staff

Introduction to the scientific study of authoritarian politics. The emergence and breakdown of authoritarian regimes; leadership changes; policy choices and institutions such regimes adopt. Analysis of public policy discourse on authoritarian politics; the potential for transition to democracy. SO  
Global Affairs: Development

**GLBL 221a / ANTH 257a / HLTH 260a, Biocultural and Ecological Perspectives on Global Health** Catherine Panter-Brick

Overview of the biological, social, individual, and structural determinants of health in the Western and non-Western world. Health, well-being, health care systems, and health-seeking behaviors situated in their broader ecological, biomedical, social, economic, political, and moral contexts. Critical perspectives on local and global approaches to understanding health problems and health interventions. SO  
Global Affairs: Development

**\* GLBL 225b, Approaches to International Development** Daniel Keniston

The unique set of challenges faced by households in developing countries, and the economic theories that have been developed to understand them. Health, education, and discrimination against women in the household; income generation, savings, and credit; institutions, foreign aid, and conflict. Recent econometric techniques applied to investigate the underlying causes of poverty and the effectiveness of development programs. Enrollment limited to sophomores, juniors, and seniors. Prerequisite: GLBL 121. QR, SO

**GLBL 234b / ECON 184b, International Economics** Peter Schott

Introduction to conceptual tools useful for understanding the strategic choices made by countries, firms, and unions in a globalized world. After two terms of introductory economics. SO

Global Affairs: Development

**GLBL 237a / ECON 185a, Debates in Macroeconomics**

Stephen Roach and Aleh Tsyvinski

Introduction to current theoretical and practical debates in macroeconomics. In-class debates between the instructors on topics such as economic crises, fiscal and monetary policy, inflation, debt, and financial regulations. Prerequisites: introductory microeconomics and macroeconomics. SO

Global Affairs: Development

**\* GLBL 238a / ECON 408a, International Trade Policy** Giovanni Maggi

Analysis of issues concerning international trade policy and agreements, including recent academic research. Welfare analysis of trade policy; the political economy of trade policy; international trade agreements. Attention to both theoretical methods and empirical research. Prerequisites: intermediate microeconomics and ECON 184. SO

Global Affairs: Development

**GLBL 247b / PLSC 128b, Development under Fire** Jason Lyall

The recent emergence of foreign assistance as a tool of counterinsurgency and post-conflict reconciliation. Evaluation of the effects of aid in settings such as Afghanistan, Iraq, Colombia, and the Philippines. Examination of both theory and practice of conducting development work in the shadow of violence. Strengths and weaknesses of different evaluation methods, including randomized control trials (RCTs) and survey experiments. SO

Global Affairs: Development

Global Affairs: Security

**GLBL 260a / PLSC 130a, Nuclear Politics** Alexandre Debs

The pursuit, use, and non-use of nuclear weapons from the Manhattan Project to the present. The effect of the international system, regional dynamics, alliance politics, and domestic politics in the decision to pursue or forgo nuclear weapons. The role of nuclear weapons in international relations, the history of the Cold War, and recent challenges in stemming nuclear proliferation. SO

Global Affairs: Security

**GLBL 263b / PLSC 439b, Challenges of Young Democracies** Ana De La O Torres

Challenges faced by young democracies, such as organizing free and fair elections, controlling government corruption, building an accountable system of governance, sustaining development, and curtailing conflict and violence. Factors that lead to the consolidation of democratic politics or to stagnation and a return to nondemocratic political systems. SO

Global Affairs: Security

**GLBL 264b / HIST 191b, The United States and the World, 1776–1920** Patrick Cohrs

The transformation of the modern international system, and America's role in this system, from the eighteenth century to the Paris peace conference. Causes of international conflicts from the revolutionary wars of the 1700s to World War I, the Vienna and Versailles peace settlements, the Monroe Doctrine, imperialism in

international politics, America's emergence as a world power, and Wilson's pursuit of a "peace to end all wars." Focus on the influence of ideas and learning processes on international history. HU

Global Affairs: Security

**GLBL 269b / PLSC 359b, Violence and Civil Strife** Stathis Kalyvas

An examination of political violence with an emphasis on civil wars, presently the dominant form of war. SO

Global Affairs: Security

**\* GLBL 275a or b, Approaches to International Security** Staff

Central topics and major approaches in the contemporary academic study of international security. Focus on the use of violence among and within states by both state and nonstate actors. Analysis of the potential and the shortcomings of current theoretical and empirical work. Not open to freshmen. Priority to Global Affairs majors.

SO

**GLBL 281a / HIST 221a, Military History of the West since 1500** Paul Kennedy

A study of the military history of the West since 1500, with emphasis on the relationship between armies and navies on the one hand, and technology, economics, geography, and the rise of the modern nation-state on the other. The coming of airpower in its varied manifestations. Also meets requirements for the Air Force and Naval ROTC programs. HU

Global Affairs: Security

**\* GLBL 302b / ECON 452b / EP&E 300b, Contemporary Issues in Energy Policy**

Ioannis Kessides

Overview of challenges in the global energy framework generated by concerns about energy security and climate change; public policies necessary for addressing these issues. Potential contributions and limitations of existing, improved or transitional, and advanced technologies. SO

Global Affairs: Development

**\* GLBL 306a, Social Enterprise in Developing Economies II** Robert Hopkins

Summer research developed into a case-study project on a topic related to the use of social enterprise in regional economic development. Prerequisite: GLBL 305.

Global Affairs: Development

**\* GLBL 307b / ECON 467b, Economic Evolution of the Latin American and Caribbean Countries** Ernesto Zedillo

Economic evolution and prospects of the Latin American and Caribbean (LAC) countries. Topics include the period from independence to the 1930s; import substitution and industrialization to the early 1980s; the debt crisis and the "lost decade"; reform and disappointment in the late 1980s and the 1990s; exploration of selected episodes in particular countries; and speculations about the future.

Prerequisites: intermediate microeconomics and macroeconomics. SO

Global Affairs: Development

**\* GLBL 310b / ECON 407b, International Finance** Konstantinos Arkolakis

A study of how consumers and firms are affected by the globalization of the world economy. Topics include trade costs, the current account, exchange rate pass-through, international macroeconomic co-movement, multinational production, and gains from globalization. Prerequisite: intermediate macroeconomics or equivalent. SO

## Global Affairs: Development

\* **GLBL 312b / EAST 454b / ECON 474b, Economic and Policy Lessons from Japan**  
Stephen Roach

An evaluation of Japan's protracted economic problems and of their potential implications for other economies, including the United States, Europe, and China. Currency pressures, policy blunders, Abenomics, bubbles, and the global economic crisis of 2008; dangers to the global economy from a protracted postcrisis recovery period. Focus on policy remedies to avert similar problems in other countries.

Prerequisite: a course in macroeconomics. SO

Global Affairs: Development

\* **GLBL 316b / ECON 462b / EP&E 228b / LAST 410b, The Economics of Human Capital in Latin America** Douglas McKee

Economic issues related to a population's education, skills, and health; focus on contemporary Latin American societies. Determinants of health and education; evaluation of human capital development policies; the role of human capital in a variety of economic contexts, including the labor market, immigration, child investment, intrahousehold bargaining, inequality, and poverty. Prerequisites: intermediate microeconomics and econometrics. SO

Global Affairs: Development

**GLBL 318a / EAST 338a / ECON 338a, The Next China** Stephen Roach

Economic development in China since the late 1970s. Emphasis on factors pushing China toward a transition from its modern export- and investment-led development model to a pro-consumption model. The possibility of a resulting identity crisis, underscored by China's need to embrace political reform and by the West's longstanding misperceptions of China. Prerequisite: introductory macroeconomics. SO

Global Affairs: Development

\* **GLBL 320a, Conflict, Resilience, and Health** Catherine Panter-Brick

Review of the many intersections of health, resilience, and conflict – including military, ethnic, religious, and interpersonal conflict. Evidence for the impact of conflict on both physical and emotional well-being; examination of the psychological, social, and governmental dimensions of resilience. SO

Global Affairs: Development

\* **GLBL 330a / ECON 465a / EP&E 224a, Debating Globalization** Ernesto Zedillo  
Facets of contemporary economic globalization, including trade, investment, and migration. Challenges and threats of globalization: inclusion and inequality, emerging global players, global governance, climate change, and nuclear weapons proliferation. Prerequisite: background in international economics and data analysis. Preference to seniors majoring in Economics or EP&E. SO RP

Global Affairs: Development

\* **GLBL 334a, Poverty and Inequality in South Africa** Staff

Factors that have shaped the South African economy. Methods for overcoming poverty and inequality in South Africa. Ways in which strategies informed by South Africa's history can be applied to other economies that are currently undergoing industrialization.

\* **GLBL 336b / EP&E 243b / LAST 423b / PLSC 423b, Political Economy of Poverty Alleviation** Ana De La O Torres

Overview of classic and contemporary approaches to the question of why some countries have done better than others at reducing poverty. Emphasis on the role of politics. so

Global Affairs: Development

\* **GLBL 338b / EP&E 294b / PLSC 457b, Social Welfare and Nongovernmental Organizations** Katharine Baldwin

The role of nonstate actors such as religious organizations, community associations, and international NGOs in the delivery of basic goods and services in developing countries. Welfare states in Europe and North America and reasons why states outside these regions have not developed similar institutions; causes of and logic behind various nonstate actors' involvement in social welfare provision; economic, institutional, and political effects of having nonstate actors provide social services and public goods. so

Global Affairs: Development

\* **GLBL 345a, Humility** David Brooks

Traditions of modesty and humility in character building and political leadership. Contemporary understandings of character and character building. The premise that human beings are blessed with many talents but are also burdened by sinfulness, ignorance, and weakness. The concept of humility in works by and about Homer, Moses, Augustine, Montaigne, Burke, Niebuhr, Martin Luther King, Jr., and others.

HU

Global Affairs: Security

Global Affairs: Development

\* **GLBL 361a / PLSC 436a, Violence: State and Society** Matthew Kocher

Examination of large-scale violence, generally within sovereign states. Why violence happens, why it takes place in some locations and not others, why it takes specific forms (insurgency, terrorism, civilian victimization), what explains its magnitude (the number of victims), and what explains targeting (the type or identity of victims). so

Global Affairs: Security

\* **GLBL 362b / AFST 373b / MMES 282b / SOCY 339b, Imperialism, Insurgency, and State Building in the Middle East and North Africa** Jonathan Wyrzten

The historical evolution of political order from Morocco to Central Asia in the past two centuries. Focus on relationships between imperialism, insurgency, and state building. Ottoman, European, and nationalist strategies for state building; modes of local resistance; recent transnational developments; American counterinsurgency and nation-building initiatives in the region. so

Global Affairs: Security

\* **GLBL 369a, Transatlantic Relations since 1989** Jolyon Howorth

The shifting relations between the United States and the European Union since the end of the Cold War. Root causes of convergence and divergence; political and security relations; economic and trade relations; sociocultural issues. so

Global Affairs: Security

\* **GLBL 372a, The New Iraq** Emma Sky

The effects of U.S. policy, state collapse, sectarian rivalry, and the emergence of violent non-state actors following the invasion of Iraq led by the United States in 2003. Effects of external intervention and domestic legacies—patrimonialism, the political economy of oil, and violence—in shaping the new Iraq; whether Iraq had become a democracy or had reverted to authoritarianism by the end of the U.S. era. so

Global Affairs: Security

\* **GLBL 377b / PLSC 160b, The United States, Russia, and Eurasian Security**

Thomas Graham

Geopolitical competition between the United States and Russia since World War II, with a focus on the Eurasian region. Turmoil in the region resulting from the rise of new powers, nuclear proliferation, international terrorism, and the struggles of old institutions to cope with new challenges. Possibilities for shifting American-Russian relations from geopolitical competition to strategic cooperation. so RP

Global Affairs: Security

\* **GLBL 378a / PLSC 184a, The United Nations and the Maintenance of International Security** Jean Krasno

The evolution of the United Nations and its role in a post-Cold War international system both in preventive diplomacy, with its use of force for peacekeeping and peace enforcement, and in peace building. so

Global Affairs: Security

\* **GLBL 379a / PLSC 132a, China's International Relations** Jessica Weiss

Analysis of contemporary Chinese diplomacy, including China's increasing regional and global influence. Mainstream concepts and theories in international relations applied to current events and policy debates. Priority to majors in Political Science and in Global Affairs. so

Global Affairs: Security

\* **GLBL 381a / PLSC 140a, Military Power** Nuno Monteiro

The foundations, applications, evolution, and limits of military power. Reading of Clausewitz's *On War* in conjunction with contemporary works. Issues include civil-military relations, military power and political influence, coercion, small wars, occupation and insurgency, and the revolution in military affairs. so

Global Affairs: Security

\* **GLBL 384a / ER&M 362a / SOCY 363a, Genocide and Ethnic Conflict**

Jasmina Besirevic Regan

Exploration of the explosion of genocide and violent ethnic conflict in the past seventy years, including contributory historical and political elements. Consideration of ways to prevent or resolve such conflicts. Focus on questions of identity, religion, class, and nationhood as related to violence and conflict. An analytical framework developed from four case studies: the Holocaust, Cambodia, the former Yugoslavia, and Rwanda. so

Global Affairs: Security

\* **GLBL 386a, The Politics of Human Rights Law** Thania Sanchez

The effects of international efforts to promote respect for human rights. Analysis of policy tools used by states, international organizations, and nongovernmental organizations to promote human rights work, including advocacy, law, sanctions, trade,

aid, justice mechanisms, and diplomacy. Focus on issues such as genocide, torture, women's rights, children's rights, and civil and political rights. SO

Global Affairs: Security

\* **GLBL 388a, The Politics of Foreign Policy** Howard Dean

Domestic political considerations that have affected U.S. foreign policy since World War II. Historical and modern case studies include the Marshall Plan, the Bay of Pigs and Cuban missile crisis, the Vietnam War, the opening of China, the Iran hostage crisis, the collapse of the USSR, the Iraq War, and the Keystone pipeline. SO

Global Affairs: Security

\* **GLBL 390b, Cybersecurity, Cyberwar, and International Relations**

Edward Wittenstein

Analysis of international cyberrelations. Topics include cybercrime, cyberespionage, cyberwar, and cybergovernance. Readings from academic and government sources in the fields of history, law, political science, and sociology. SO

Global Affairs: Security

\* **GLBL 391a / WGSS 391a, Women in Global Affairs** Michele Malvesti

Gender in international relations, with a focus on the roles of women in peace, war, and defense. The effects of armed conflict on women, including characterizations of women as warriors and as victims; perspectives and capabilities that women bring to international negotiations, peace accords, postconflict reconstruction, and the building of civil society; gender and governance, with attention to stereotypes and challenges that female leaders face. SO

Global Affairs: Security

\* **GLBL 392a, Intelligence, Espionage, and American Foreign Policy**

John Negroponte and Edward Wittenstein

The discipline, theory, and practice of intelligence; the relationship of intelligence to American foreign policy and national security decision-making. Study of the tools available to analyze international affairs and to communicate that analysis to senior policymakers. Case studies of intelligence successes and failures from World War II to the present.

Global Affairs: Security

\* **GLBL 450a or b, Directed Research** Susan Hyde

Independent research under the direction of a faculty member on a special topic in global affairs not covered in other courses. Permission of the director of undergraduate studies and of the instructor directing the research is required.

\* **GLBL 499a, Senior Capstone Project** Staff

Students work in small task-force groups and complete a one-term public policy project under the guidance of a faculty member. Clients for the projects are drawn from government agencies, nongovernmental organizations and nonprofit groups, and private sector organizations in the United States and abroad. Projects and clients vary from year to year. Fulfills the capstone project requirement for the Global Affairs major.

## Global Health Studies

Program director: Elizabeth Bradley, LEPH 300A, 785-2937; program adviser: Kaveh Khoshnood, LEPH 405, 785-2920; [globalhealthstudies@yale.edu](mailto:globalhealthstudies@yale.edu); [ghi.yale.edu](http://ghi.yale.edu)



## GLOBAL HEALTH STUDIES ADVISORY COMMITTEE

Elizabeth Bradley (*Chair*) (*Public Health*), Jane Edwards (*Yale College Dean's Office*), Marcia Inhorn (*Anthropology*), Kaveh Khoshnood (*Public Health*), Stephen Latham (*Political Science*), Catherine Panter-Brick (*Anthropology*), Joanna Radin (*History of Medicine*), Mark Saltzman (*Biomedical Engineering*), William Segraves (*Vice Chair*) (*Yale College Dean's Office*), Michael Skonieczny (*Yale Global Health Leadership Institute*), Stephen Stearns (*Ecology and Evolutionary Biology*), Kristina Talbert-Slagle (*Public Health*), Christian Tschudi (*Public Health, Director of Graduate Studies*), Paul Turner (*Ecology and Evolutionary Biology*), John Wargo (*Forestry & Environmental Studies*)

Issues related to health are among the most important challenges facing societies, both domestically and globally. Finding solutions to health-related problems requires multidisciplinary comprehension of all dimensions of health, including biological and social determinants, economics and politics of health care systems and health care delivery, and ways in which health is understood by individuals, societies, and cultures. The Global Health Studies program facilitates global health education for undergraduates at Yale. Although not a major, the program offers courses through an interdisciplinary framework that brings together the natural sciences, the social sciences, and the humanities. Students choose a major in another department or program and expand their discipline with elective courses offered by Global Health Studies. Students can also pursue interdisciplinary concentrations and global health tracks within their major, allowing them to pursue an area of study that crosses conventional disciplinary and departmental boundaries. For details about coursework, students should consult the director of undergraduate studies in their major.

Students should supplement their classroom experience with applications in the community, whether in the United States or abroad. The Global Health Studies program organizes opportunities such as the Global Health Fellows program (<http://ghi.yale.edu/gh-fellows>), the Global Health Initiative field experience (<http://ghi.yale.edu/fellowships>), and the Yale–Collaborative Action Project (<http://ghi.yale.edu/fellowships>).

Qualified students may take graduate courses at the School of Public Health, subject to the restrictions on graduate and professional school enrollment (p. 68) described in the Academic Regulations. Further information about these courses and other graduate offerings can be found in the School of Public Health bulletin (<http://www.yale.edu/printer/bulletin/htmlfiles/publichealth>). For information about the five-year B.A.-B.S./M.P.H. degree program offered jointly with the School of Public Health, see under Public Health (p. 607).

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## Global Health Studies Courses

\* **HLTH o81a, Current Issues in Medicine and Public Health** Robert Bazell  
 Analysis of issues in public health and medicine that get extensive media attention and provoke policy debates. Topics include vaccination, the value of cancer screening and genetic testing, determinants of a healthy lifestyle, the U.S. role in global health, and the cost of health care. Enrollment limited to freshmen with a score of 4 or 5 on

the Advanced Placement examination in Biology or the equivalent. Preregistration required; see under Freshman Seminar Program.

**HLTH 140b / SOCY 126b, Health of the Public** Nicholas Christakis

Biological and social factors that jointly determine the health of individuals and populations. The influence of medical care, social networks, and socioeconomic inequality on illness, recovery, and death. SO

\* **HLTH 155a / MCDB 106a, Biology of Malaria, Lyme, and Other Vector-Borne Diseases** Alexia Belperron

Introduction to the biology of pathogen transmission from one organism to another by insects; special focus on malaria and Lyme disease. Biology of the pathogens including modes of transmission and establishment of infection; immune responses and the associated challenges to prevention and treatment. Intended for non-science majors; preference to freshmen and sophomores. Prerequisite: high school biology. SC

**HLTH 170a / AMST 247a / FILM 244a / HIST 147a / HSHM 202a, Media and Medicine in Modern America** John Warner and Gretchen Berland

Relationships between medicine, health, and the media in the United States from 1870 to the present. The changing role of the media in shaping conceptions of the body, creating new diseases, influencing health and health policy, crafting the image of the medical profession, informing expectations of medicine and constructions of citizenship, and the medicalization of American life. HU

\* **HLTH 215b / PSYC 319b, Health Psychology** Benjamin Toll

An introduction to health behaviors and ways in which they can be altered. Health-compromising behaviors such as the use of alcohol, drugs, and tobacco; the impact of health psychology on problems such as stress, pain management, AIDS, and cancer. SO

\* **HLTH 230a, Global Health: Challenges and Responses** Richard Skolnik

Overview of the determinants of health and how health status is measured, with emphasis on low- and middle-income countries. The burden of disease, including who is most affected by different diseases and risk factors; cost-effective measures for addressing the problem. The health of the poor, equity and inequality, and the relationship between health and development. WR, SO

**HLTH 260a / ANTH 257a / GLBL 221a, Biocultural and Ecological Perspectives on Global Health** Catherine Panter-Brick

Overview of the biological, social, individual, and structural determinants of health in the Western and non-Western world. Health, well-being, health care systems, and health-seeking behaviors situated in their broader ecological, biomedical, social, economic, political, and moral contexts. Critical perspectives on local and global approaches to understanding health problems and health interventions. SO

\* **HLTH 325a / GLBL 189a / LAST 416a, Methods and Ethics in Global Health Research** Leslie Curry

Introduction to research methods in global health that recognize the influence of political, economic, social, and cultural factors. Quantitative, qualitative, and mixed-method approaches; ethical aspects of conducting research in resource-constrained settings; the process of obtaining human subjects' approval. Students develop

proposals for short-term global health research projects conducted in resource-constrained settings. SO RP

\* **HLTH 330a, Case Studies in Global Health** Richard Skolnik

Exploration of three important themes in the study of global health: efforts to eradicate communicable disease, attempts to reform health systems, and investments to achieve more equity and equality in health services delivery. Case studies examined from historical, economic, technical, epidemiological, political, sociological, and managerial perspectives. Prerequisite: HLTH 230 or equivalent, or with permission of instructor.

WR, SO

\* **HLTH 444b, Biology, Pathogenesis, and Natural History of HIV/AIDS**

Kristina Talbert-Slagle

Study of HIV/AIDS from the perspectives of molecular biology, immunology, sociology, history, and epidemiology. Prerequisites: BIOL 101, 102, 103, and 104, or permission of instructor.

\* **HLTH 480b / E&EB 460b, Studies in Evolutionary Medicine I** Stephen Stearns

Principles of evolutionary biology applied to issues in medical research and practice. Lactose and alcohol tolerance; the "hygiene hypothesis"; genetic variation in drug response and pathogen resistance; spontaneous abortions, immune genes, and mate choice; the evolution of aging; the ecology and evolution of disease; the emergence of new diseases. Students develop proposals for research to be conducted during the summer. Admission by competitive application; forms are available on the EEB Web site (<http://www.eeb.yale.edu>). SC

\* **HLTH 481a / E&EB 461a, Studies in Evolutionary Medicine II**

James Childs, Durland Fish, and Alison Galvani

Continuation of E&EB 460. Prerequisite: E&EB 460 or permission of instructor. SC

\* **HLTH 490a, Global Health Research Colloquium** Kristina Talbert-Slagle

Development of findings from recent summer fieldwork into material suitable for publication. Attention to methodological approaches and ethical considerations in research. Students meet as a group regularly to present research, evaluate progress, and offer constructive feedback. Priority to Global Health Fellows. RP ½ Course cr

## Related Courses

\* **AFST 401a, Research Methods in African Studies** Cheryl Doss

Disciplinary and interdisciplinary research methodologies in African studies, with emphasis on field methods and archival research in the social sciences and humanities. Research methodologies are compared by studying recent works in African studies.

\* **ANTH 386a, Humanitarian Interventions: Ethics, Politics, and Health**

Catherine Panter-Brick

Analysis of humanitarian interventions from a variety of social science disciplinary perspectives. Issues related to policy, legal protection, health care, morality, and governance in relation to the moral imperative to save lives in conditions of extreme adversity. Promotion of dialogue between social scientists and humanitarian practitioners. SO

Anthropology: Sociocultural

**BENG 100b, Frontiers of Biomedical Engineering** Mark Saltzman

The basic concepts of biomedical engineering and their connection with the spectrum of human activity. Introduction to the fundamental science and engineering on which biomedical engineering is based. Topics include genetic engineering, cell culture engineering, vaccines, drug discovery and delivery, cardiovascular physiology, biomechanics, and biomedical imaging. Designed for science and non–science majors.  
SC

**\* BENG 405b / EVST 415b, Biotechnology and the Developing World**

Anjelica Gonzalez

Study of technological advances that have global health applications. Ways in which biotechnology has enhanced quality of life in the developing world. The challenges of implementing relevant technologies in resource-limited environments, including technical, practical, social, and ethical aspects. Prerequisite: MCDB 120, or BIOL 101 and 102.

**ECON 170a, Health Economics and Public Policy** Howard Forman

Application of economic principles to the study of the U.S. health care system. Emphasis on basic principles about the structure of the U.S. system, current problems, proposed solutions, and the context of health policy making and politics. After introductory microeconomics. SO

**ECON 325b, Economics of Developing Countries** Christopher Udry

Analysis of current problems of developing countries. Emphasis on the role of economic theory in informing public policies to achieve improvements in poverty and inequality, and on empirical analysis to understand markets and responses to poverty. Topics include microfinance, education, health, agriculture, intrahousehold allocations, gender, and corruption. After introductory microeconomics. SO

**[ ECON 327, The Economics of Poverty Alleviation ]****\* ECON 405b, Economics of Health and Health Care** Amanda Kowalski

Economic principles and empirical methods applied to issues in health economics. Discussion of policies to address market failures in health care markets. Consumer behavior in medical markets, valuing medical improvements, and evaluating health insurance reform. Prerequisites: intermediate microeconomics and econometrics. SO

**[ ECON 461, Economics, Addiction, and Public Policy ]****\* ECON 462b / EP&E 228b / GLBL 316b / LAST 410b, The Economics of Human Capital in Latin America** Douglas McKee

Economic issues related to a population's education, skills, and health; focus on contemporary Latin American societies. Determinants of health and education; evaluation of human capital development policies; the role of human capital in a variety of economic contexts, including the labor market, immigration, child investment, intrahousehold bargaining, inequality, and poverty. Prerequisites: intermediate microeconomics and econometrics. SO

**\* ECON 464a / AFST 464a, The Economics of Africa** Cheryl Doss

Study of key microeconomic issues facing African economies and of the economic tools used to analyze such issues. Topics include infrastructure, land, agriculture, conflict, intrahousehold issues, health and education, microfinance and risk, and

coping strategies. Readings from recent literature in microeconomic development. Prerequisites: intermediate microeconomics and econometrics. SO

[ ENVE 441, **Biological Processes in Environmental Engineering** ]

\* EP&E 246a / AFST 420a / LAST 406a / PLSC 430a, **The Politics of Development Assistance** David Simon

Study of development assistance, a dominant feature of the political economies of some of the world's poorest countries. The motivations and politics of aid from donors' perspectives; the political and economic impact of aid on developing countries. Proposals to make aid a more effective instrument of development. SO  
EP&E: PoliticalSystems Core

\* EP&E 271b / AFST 447b / ER&M 271b / PLSC 447b, **The Rwandan Genocide in Comparative Context** David Simon

An examination of the 1994 Rwandan genocide: historical sources of the conflict, the motivations of the killers, actions and reactions of outside actors, efforts to reconstruct a post-genocide society, and continuation of the genocidal dynamic within the Great Lakes region. Consideration of other countries in similar situations, as well as other genocides in recent decades. SO  
EP&E: Social Theory Core

EVST 255b / F&ES 255b / PLSC 215b, **Environmental Politics and Law** John Wargo

Exploration of the politics, policy, and law associated with attempts to manage environmental quality and natural resources. Themes of democracy, liberty, power, property, equality, causation, and risk. Case histories include air quality, water quality and quantity, pesticides and toxic substances, land use, agriculture and food, parks and protected areas, and energy. SO

\* EVST 261a / F&ES 261a / G&G 261a, **Minerals and Human Health** Ruth Blake  
Study of the interrelationships between Earth materials and processes and personal and public health. The transposition from the environment of the chemical elements essential for life. After one year of college-level chemistry or with permission of instructor; G&G 110 recommended. SC

\* GLBL 306a, **Social Enterprise in Developing Economies II** Robert Hopkins  
Summer research developed into a case-study project on a topic related to the use of social enterprise in regional economic development. Prerequisite: GLBL 305.  
Global Affairs: Development

HSBM 235b / HIST 234b, **Epidemics and Society in the West since 1600**

Frank Snowden

A study of the impact of epidemic diseases such as bubonic plague, cholera, malaria, and AIDS on society, public health, and the medical profession in comparative and international perspective. Topics include popular culture and mass hysteria, the mortality revolution, urban renewal and rebuilding, sanitation, the germ theory of disease, the emergence of scientific medicine, and debates over the biomedical model of disease. HU

\* HSBM 437b / HIST 435Jb, **The Global Crisis of Malaria** Frank Snowden

The global crisis of malaria examined in comparative and historical context. The mosquito theory of transmission and other developments in scientific understanding of the disease; World Health Organization strategies to eradicate malaria since 1955;

the development of tools such as insecticides, medication, and bed nets; the attempt to create an effective vaccine. WR, HU

\* **HUMS 076a / HSHM 007a, Epidemics in Global Perspective** William Summers  
Interaction of epidemic diseases and society. The response of government, medicine, and the public to the threat or actual presence of widespread contagious diseases. The notion of major epidemics as one of the key contingencies of history, critically examined through contemporary medical, political, and literary accounts. The changing responses of societies and governments to epidemics as well as the reasons for those responses. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU, SO

\* **MCDB 050a, Immunology and Microbes** Paula Kavathas  
Introduction to the immune system and its interaction with specific microbes. Attention both to microbes that cause illness, such as influenza, HIV, and HPV, and to microbes that live in harmony with humans, collectively called the microbiome. Readings include novels and historical works on diseases such as polio and AIDS. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SC RP

**MCDB 290b, Microbiology** Christine Jacobs-Wagner and Carol Bascom-Slack  
Cell structure of microorganisms, bacterial genetics, microbial evolution and diversity, microbial development, microbial interaction, chemotaxis and motility, gene regulation, microbial genomics, host defense systems, infectious diseases, viruses, and biological weapons. Prerequisites: BIOL 101 and 102, or a term of biochemistry, genetics, cell biology, or molecular biology. SC

\* **MENG 491b, Appropriate Technology and the Developing World** Joseph Zinter  
Introduction to user-centered design through exploration of appropriate technology, a class of solutions that solve a particular need and are viable and sustainable within the environmental, economic, cultural, and technological infrastructure for which they are intended. Focus on technologies for use in the developing world. Student design teams conceptualize, ideate, prototype, and generate a commercialization plan for a real-world appropriate technological device. RP

**PLSC 248a, Political Economy of Health Care** Peter Swenson  
Political and economic factors that have influenced efforts to achieve quality, economy, and equality in the delivery of American health care since the early twentieth century; some attention to international comparisons. Medical licensing; drug regulation; malpractice law; provider payment and care management; guaranteed health insurance; emergence of the private, employer-based insurance system; recent legislative actions and controversies concerning the quality and cost-effectiveness of health care. Recommended preparation: introductory microeconomics. SO

**PLSC 257b, Bioethics and Law** Stephen Latham  
The treatment by American law of major issues in contemporary biomedical ethics: informed consent, assisted reproduction, abortion, end-of-life care, research on human subjects, stem cell research, and public health law. Readings include legal cases, statutes, and regulations. No background in law assumed. SO

\* **PLSC 446b / EP&E 258b / SOCY 369b, Welfare States across Nations** Sigrun Kahl  
How different societies counterbalance capitalism and deal with social risks. Welfare state regimes and their approaches to inequality, unemployment, poverty, illness,

disability, child rearing, and old age. Why the United States has an exceptionally small welfare state. SO

\* **PSYC 355a, Clinical Psychology in the Community** Kristi Lockhart

Mental disorders as they are treated within a community setting. Students participate in a fieldwork placement, working either one-on-one or in groups with the psychiatrically disabled. Seminar meetings focus on such topics as the nature of severe mental disorders, the effects of deinstitutionalization, counseling skills, and social policy issues related to mental health. Prerequisite: PSYC 180 or permission of instructor.

Psychology: Social Science

## Hellenic Studies

Directors: Stathis Kalyvas, 115 Prospect Pl., 432-5386, stathis.kalyvas@yale.edu; John Geanakoplos, 30 Hillhouse Ave., 432-3397, john.geanakoplos@yale.edu; program administrator: George Syrimis, 34 Hillhouse Ave., 432-9342, george.syrimis@yale.edu; www.yale.edu/macmillan/hsp

### FACULTY ASSOCIATED WITH THE PROGRAM OF HELLENIC STUDIES

**Professors** John Geanakoplos (*Economics*), Stathis Kalyvas (*Political Science*)

**Lecturer** George Syrimis

**Senior Lector** Maria Kaliambou

Hellenic Studies is a program of the Council on European Studies. The core of the program is the teaching of modern Greek, supplemented with other courses and events related to the study of postantiquity Greece, as well as the society and culture of modern Greece and its interaction with the rest of Europe and the world. Related courses can be found in the listings of Anthropology, History, History of Art, Literature, Political Science, Religious Studies, and Russian and East European Studies. A major in Ancient and Modern Greek is described under Classics (p. 192). Students who have an interest in postantiquity Greek language, society, or culture are advised to consult with the associate program chair of the Hellenic Studies program.

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## Courses

\* **MGRK 001b / CLCV 008b / HUMS 074b / LITR 091b / RSEE 008b, Western**

**Visions of Greece** George Syrimis

Literary, philosophical, political, and aesthetic categories used by Western cultures since the Enlightenment to construct the concepts "Hellenic" and "ancient Greece." The refiguring of ancient Greek civilization as an ideal cultural template, symbolic origin, and philosophical reflection for both European philhellenes and contemporary Greeks. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **MGRK 002a / HUMS 051a / RLST 016a, Religion and Literature: Irreverent Texts**

George Syrimis and Hindy Najman

The complex relationship between religion and literature from the nineteenth century to the present. Focus on the Greco-Roman and Judeo-Christian traditions. Modernity and tradition, the legitimacy of ritual, the relationship between church and state,

and the reception of antiquity. The emergence of modern discourses of gender and sexuality in light of religious practice and dogma. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

**MGRK 110a, Elementary Modern Greek I** Maria Kaliambou

An introduction to modern Greek, with emphasis on oral expression. Use of communicative activities, graded texts, written assignments, grammar drills, audiovisual material, and contemporary documents. In-depth cultural study. Credit only on completion of MGRK 120. L1 1½ Course cr

**MGRK 120b, Elementary Modern Greek II** Maria Kaliambou

Continuation of MGRK 110. Prerequisite: MGRK 110. L2 1½ Course cr

**\* MGRK 130a, Intermediate Modern Greek I** Maria Kaliambou

Further development of oral and written linguistic skills, using authentic readings and audiovisual materials. Continued familiarization with contemporary Greek culture. Prerequisite: MGRK 120 or equivalent. Course includes students from Cornell University via videoconference. L3 1½ Course cr

**\* MGRK 140b, Intermediate Modern Greek II** Maria Kaliambou

Further development of listening, speaking, reading, and writing skills in modern Greek. Presentation of short research projects related to modern Greece. Prerequisite: MGRK 130 or equivalent. Course includes students from Cornell University via videoconference. L4 1½ Course cr

**\* MGRK 212b / HUMS 277b / LITR 328b, Folktales and Fairy Tales**

Maria Kaliambou

History of the folktale from the late seventeenth through the late twentieth centuries. Basic concepts, terminology, and interpretations of folktales, with some attention to twentieth-century theoretical approaches. Performance and audience, storytellers, and gender-related distinctions. Interconnections between oral and written traditions in narratives from western Europe and Greece. HU TR

**\* MGRK 214a / ENGL 243a / HUMS 428a / LITR 207a / WGSS 215a, Modern Literature and the Eastern Mediterranean** George Syrimis

The formative influences of Sappho and C. P. Cavafy on the Anglo-American literary tradition from the twentieth century to the present. Nationalism and imperialism, sexuality and aesthetics, biography and art, sapphic verse, the reception of the classical tradition, and the topography of modernity. Writers' fascination with the eastern Mediterranean as an alternative locus for modern Greek, English, and American identities. HU

**\* MGRK 481a and MGRK 482b, Independent Tutorial** Staff

For students with advanced language skills in modern Greek who wish to engage in individual study or concentrated reading and research on material not otherwise offered in courses. Applicants submit a detailed project proposal to the associate program chair. The student must meet with the instructor for at least one hour each week, and the work must terminate in a term paper or its equivalent.



# History

Director of undergraduate studies: Beverly Gage, 216 HGS, 432-1355,  
beverly.gage@yale.edu; history.yale.edu

## FACULTY OF THE DEPARTMENT OF HISTORY

**Professors** Jean-Christophe Agnew, Abbas Amanat, Ned Blackhawk, David Blight, Daniel Botsman, Paul Bushkovitch, George Chauncey, Carolyn Dean, John Demos (*Emeritus*), Carlos Eire, John Mack Faragher, Paul Freedman, Joanne Freeman, John Gaddis, Beverly Gage, Glenda Gilmore, Bruce Gordon, Valerie Hansen, Robert Harms, Jonathan Holloway, Matthew Jacobson, Gilbert Joseph, Paul Kennedy, Daniel Kevles, Benedict Kiernan, Jennifer Klein, Naomi Lamoreaux (*Chair*), Bentley Layton, Kathryn Lofton, Mary Lui, Joseph Manning, Ivan Marcus, John Merriman, Joanne Meyerowitz, Alan Mikhail, Peter Perdue, Steven Pincus, Stephen Pitti, Lamin Sanneh, Stuart Schwartz, Frank Snowden, Timothy Snyder, Harry Stout, William Summers, J. Adam Tooze, Francesca Trivellato, John Warner, Anders Winroth, Jay Winter, John Witt, Keith Wrightson

**Associate Professors** Patrick Cohrs, Fabian Drixler, Andrew Johnston, Naomi Rogers, Edward Rugemer, Paul Sabin, Marci Shore, Eliyahu Stern

**Assistant Professors** Paola Bertucci, Rosie Bsheer, Rohit De, Alejandra Dubcovsky, Marcela Echeverri, Anne Eller, Crystal Feimster, Daniel Magaziner, Isaac Nakhimovsky, Joanna Radin, William Rankin, Julia Stephens, Jenifer Van Vleck

**Senior Lecturers** Annping Chin, Becky Conekin, Bettyann Kevles, Stuart Semmel, Rebecca Tannenbaum

**Lecturers** Adel Allouche, Amanda Behm, Genevieve Carpio, Raymond Clemens, Jeremy Friedman, Jay Gitlin, Agostino Inguscio, Kathryn James, George Levesque, William Metcalf, Ivano Dal Prete, Pierre Purseigle, Chitra Ramalingam, Ariel Ron, William Summers, Stephen Vider

History is the study of ways in which human activities in the past have shaped the contours of the present. Historians ask not only how the world came to be the way it is, but also why and how societies have changed and developed over time. Yale's History department offers a wide range of courses that pursue these kinds of questions in a vast range of time periods and regions. History majors learn how to understand and analyze a variety of sources, and then to write about them in engaging ways. They also learn specialized skills in archival and online research, and in the art of crafting a persuasive argument. The History major is thus an excellent preparation for careers in many fields, including law, medicine, journalism, public policy, consulting, business, and the arts. The History major is one of the most diverse and most popular majors at Yale.

**Prerequisite** The prerequisite for the major is two term courses in History. Courses completed in fulfillment of the prerequisite may be applied toward the requirements of the major.

**Requirements of the major** Twelve term courses in History are required. Within that number, History majors are largely free to choose their own curriculum. There are no required courses in the History major (outside of the senior essay), and there are no specific prerequisites that must be fulfilled. All lecture courses in the History

department are open to all students in Yale College, regardless of year, major, or academic background.

The History department requires that majors distribute their courses over a span of time periods and regions, according to a "Rule of Two." Students must take two courses in history of U.S. or Canada (courses in the colonial period may fulfill this requirement), two in history of Europe or Britain (courses in Greek and Roman, Byzantine, and Russian history may fulfill this requirement), two in history of Latin America, Asia, or Africa/Middle East (designated as "LAAA"; courses in history of the Middle East may fulfill this requirement), two in preindustrial history (generally before 1800; identified in course listings), two departmental seminars (usually taken in the sophomore or junior year), and two terms of the senior essay.

Students may count the same courses toward geographical, preindustrial, and seminar requirements. For instance, a departmental seminar on premodern Japan would simultaneously fulfill the preindustrial, seminar, and LAAA geographical requirements.

**Selection of courses** The Department of History encourages each student to devise a program of study that, while meeting individual interests and needs, also achieves a balance between broad intellectual curiosity and specialization. Exposure to a variety of areas of history is desirable because only wide-ranging experience can give students confidence in having discovered their own true interests and aptitudes. Equally important, studying various times and societies, including preindustrial ones, prevents provincialism and provides the comparative knowledge essential to a clearer understanding of the area chosen for specialization. Finally, the department assumes that all students understand the vital importance of studying the historical traditions from which their own society has developed.

To help students organize their course selections, the History department has developed thematic programs of study, or pathways, based on areas of particular strength within the History faculty. Pathways are not required for the major; they are intended to serve as useful (and optional) intellectual guides to the selection of courses. A sample of pathways includes The World Economy; War and Society; Social Change and Social Movements; Race, Gender, and Sexuality; Ideas and Intellectuals; and Politics, Law, and Government. A full list of pathways, including the courses relevant to each, is available on the History department Web site (<http://history.yale.edu/academics/undergraduate-program/pathways>).

**Departmental seminars** All students who declare the History major are entitled to preregister for two departmental seminars (designated by a course number ending in J, such as HIST 136J). Seminars are popular, and often fill up quickly. Students may use their preregistration privileges at any time after declaring the major, in their sophomore, junior, or senior years. Most History majors take more than the required two seminars; many majors take two or three seminars per term in their senior year. Sophomores contemplating study abroad are urged to consider taking at least one seminar in the sophomore year. Residential college seminars, study-abroad courses, and courses in other departments that count toward the History major do not fulfill the departmental seminar requirement.

**Senior essay** Students in the History major are not passive consumers of historical knowledge: they create original works of history themselves. In the senior year, each

major partners with a History professor to produce a significant two-term independent essay based on original primary-source research. The range of acceptable topics is wide, but most essays fall into two categories. The first involves the study of a significant historical subject through research in accessible source materials. The second is a critical assessment of a significant historical controversy or historiographical issue.

Seniors receive course credit for satisfactory completion of their departmental essays by completing HIST 495 and 496 during the senior year. For more information on the senior essay, see the department's senior essay handbook (<http://history.yale.edu/academics/undergraduate-program/senior-departmental-essay/senior-essay-handbook>).

**Advising** All students who declare the History major are assigned an adviser from among the departmental faculty. The adviser is available throughout the year for consultation about courses and the major. At the beginning of each term, students majoring in History must have their schedule signed and approved by their departmental adviser. It is possible for students to change advisers provided they obtain the written consent of the new adviser. Students may also request an adviser in a particular region of the world or area of expertise.

**Combined B.A./M.A. degree program** Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See "Simultaneous Award of the Bachelor's and Master's Degrees" under Special Arrangements, section K (p. 63), in the Academic Regulations (p. 32). Interested students should consult the director of undergraduate studies prior to the sixth term of enrollment for specific requirements in History.

**Course numbering** Courses numbered HIST 001 to 099 are freshman seminars, with enrollment limited to 18. Courses numbered in the 100s are in the history of the United States or Canada; those in the 200s, Europe and Britain; and those in the 300s, Africa, Asia, Latin America, and the Middle East. Courses numbered in the 400s address global topics. Courses ending with the letter "J" are departmental seminars; all seminars are available for preregistration by History majors and are capped at 15 students.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** 2 term courses in hist

**Number of courses** 12 term courses (incl prereqs and senior essay)

**Distribution of courses** 2 courses in hist of U.S. or Canada, 2 in hist of Europe or Britain, 2 in hist of Africa, Asia, Latin America, or Middle East; 2 of preceding must be preindustrial hist; at least 2 departmental sems

**Substitution permitted** Relevant course approved by DUS

**Senior requirement** Senior essay (HIST 495 and 496 )

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## Freshman Seminars

Enrollment in these seminars is limited to freshmen. Preregistration is required; see under Freshman Seminar Program.

\* **HIST 007a / AMST 014a, History of U.S.–Latin American Relations**

Jenifer Van Vleck and Taylor Jardno

Cultural history of the complicated relationship between the United States and Latin American and Caribbean countries, from Haitian independence in 1798 to the present. Themes include imperialism, political economy, tourism, migration, and ideologies of gender, race, and nation. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 016a / AFAM 060a / AMST 060a, Significance of American Slavery**

Edward Rugemer

The history of American slavery, its destruction during the nineteenth century, and its significance today. Topics include the origins of slavery, the development of racism, the transatlantic slave trade, the experience of enslavement, resistance to slavery, the abolitionist movement, the process of emancipation, and the perpetuation of slavery and other forms of unfree labor in the twenty-first century. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 018a / AMST 019a, Commodities as U.S. History** Matthew Jacobson

American social, cultural, and political history introduced through study of the production, distribution, and consumption of common commodities. Topics include political economy, slavery, industrialization, labor, the rise of the corporation, the growth of the administrative and regulatory state, geopolitics, foreign policy, and cultural change. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. RP

\* **HIST 022a, What History Teaches** John Gaddis

An introduction to the discipline of history. History viewed as an art, a science, and something in between; differences between fact, interpretation, and consensus; history as a predictor of future events. Focus on issues such as the interdependence of variables, causation and verification, the role of individuals, and to what extent historical inquiry can or should be a moral enterprise. WR, HU

\* **HIST 028b / AMST 002b, American Consumer Culture in the Twentieth Century**

Jean-Christophe Agnew

An interdisciplinary introduction to twentieth-century American consumer culture, exploring the rise (and fall) of mass consumption and its impact on the experience of family, faith, citizenship, community, gender, race, ethnicity, and politics. The changing moral valuations of consumption; the effect of consumerism on ritual life; the Americanization of immigrants and the marketing of race and ethnicity; consumer culture's reciprocal relations with literature and the arts; the politics of consumer resistance; suburbanization; the consumer model of citizenship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 031b, Political Islam** Julia Stephens

A historical introduction to Islamic law and debates in Islamic political thought from the Prophet to the Arab Spring. Different interpretations of Islamic law, the formation of Muslim empires, European colonialism, nationalist movements, jihad, and the role of religion in contemporary politics in Pakistan, Egypt, Malaysia, Iran, Europe, and the United States. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 038b, The Mongols in China** Valerie Hansen

Non-Chinese peoples in China who preceded Chinggis Khan's unification of the nomads in 1206. The rise of non-Chinese dynasties beginning in the early tenth century; reasons for their success; the legacy of the Mongols from the fall of their empire in China to the early twentieth century. Extensive use of primary sources. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU  
History: Preindustrial

\* **HIST 039b / SAST 020b, Mumbai: Life in a Megacity** Rohit De

Mumbai as a case study for the transformations brought by urbanization and modernity in Asia. Focus on how Mumbai's residents and its planners navigated the challenges of living in a rapidly growing cosmopolitan city and reflected it in their art and ideas. Themes include capitalism, globalization, British empire, religious pluralism, radical politics, organized crime, and Bollywood. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 041a, The Americas in the Age of Revolutions** Marcela Echeverri Munoz

The connections, contrasts, and legacies of revolutions in the British, French, and Spanish Atlantic empires in the eighteenth and nineteenth centuries. Interactions between liberalism, black politics and antislavery, indigenous autonomy and citizenship, and revolutions in the Atlantic world between the 1760s and 1880s. Topics include the foundations of the Atlantic empires, strands of anticolonialism across the Americas, social aspects of the revolutionary movements, abolitionism and emancipation processes, and relations between the emergent American nations. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HIST 042a, Oil and Empire** Rosie Bsheer

The political and social history of oil since the late nineteenth century, including global trends and processes. Oil's impact on the rise and fall of empires and the fates of nation-states; its role in war and its impact on social and cultural life. Focus on the Middle East, with some attention to Venezuela, Indonesia, and the Niger Delta. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

## Lecture Courses

**HIST 106b / AMST 191b, The Formation of Modern American Culture, 1920 to the Present** Matthew Jacobson

An introduction to the cultural history of the United States in the modern and postmodern eras, with special attention to the development of the culture industries, the popular cultures of working peoples, and the political and social meanings of cultural conflict. HU

**HIST 119b / AFAM 172b, The Civil War and Reconstruction Era, 1845–1877**  
David Blight

The causes, course, and consequences of the American Civil War. A search for the multiple meanings of a transformative event, including national, sectional, racial, constitutional, social, gender, intellectual, and individual dimensions. HU

**HIST 120a / AMST 163a / EVST 120a / HSHM 204a, Introduction to Environmental History** Paul Sabin

Ways in which people have shaped and been shaped by the changing environments of North America from precolonial times to the present. Migration of species and trade in commodities; contrasting uses of land; the impact of industry and markets; the rise of modern conservation and environmental movements; the development of public policy; the global search for resources by the United States. HU

**HIST 122b / AMST 193b, Origins of U.S. Global Power** Jenifer Van Vleck

Policies, strategies, and ideas that enabled the United States to become a world power. Manifest Destiny, expansion, and empire; American exceptionalism; nationalism and internationalism; capitalism and consumer culture; technological innovation; the relation between domestic politics and U.S. foreign policy, particularly with regard to race and gender; challenges and resistance to U.S. global power. Focus on the twentieth century, with introduction to critical moments in U.S. and international history during the seventeenth through nineteenth centuries. HU

**HIST 127a / AMST 135a / WGSS 200a, U.S. Lesbian and Gay History**

George Chauncey

Introduction to the social, cultural, and political history of lesbians, gay men, and other socially constituted sexual minorities. Focus on understanding categories of sexuality in relation to shifting normative regimes, primarily in the twentieth century. The emergence of homosexuality and heterosexuality as categories of experience and identity; the changing relationship between homosexuality and transgenderism; the development of diverse lesbian and gay subcultures and their representation in popular culture; religion and sexual science; generational change and everyday life; AIDS; and gay, antigay, feminist, and queer movements. HU

**HIST 131b / AMST 131b, American Politics and Society, 1900–1945** Glenda Gilmore

The social, political, and economic changes that transformed American society from the turn of the twentieth century through World War II. Progressive, radical, and conservative politics; war and society; the New Deal and federal social policy; race and the long civil rights movement; consumerism, business, and labor; immigration and urban development. HU

**HIST 135b / ECON 182b, American Economic History** Staff

The growth of the American economy since 1790, both as a unique historical record and as an illustration of factors in the process of economic development. The American experience viewed in the context of its European background and patterns of industrialization overseas. After introductory microeconomics. WR, SO

**HIST 136a / AFAM 125a / AMST 125a, The Long Civil Rights Movement**

Crystal Feimster

Political, social, and artistic aspects of the U.S. civil rights movement from the 1920s through the 1980s explored in the context of other organized efforts for social change. Focus on relations between the African American freedom movement and debates about gender, labor, sexuality, and foreign policy. Changing representations of social movements in twentieth-century American culture; the politics of historical analysis.

HU

**HIST 141a / AMST 141a, The American West** John Mack Faragher

The history of the American West as both frontier and region, real and imagined, from the first contacts between Indians and Europeans in the fifteenth century to the multicultural encounters of the contemporary Sunbelt. Students work with historical texts and images from Yale's Western Americana Collection. HU

**HIST 147a / AMST 247a / FILM 244a / HLTH 170a / HSHM 202a, Media and Medicine in Modern America** John Warner and Gretchen Berland

Relationships between medicine, health, and the media in the United States from 1870 to the present. The changing role of the media in shaping conceptions of the body, creating new diseases, influencing health and health policy, crafting the image of the medical profession, informing expectations of medicine and constructions of citizenship, and the medicalization of American life. HU

**HIST 150b, American Legal History** John Witt

The history of law in the United States and British North America from European contact through the 1970s. Law in the colonies and among Native peoples; legal controversies of the American Revolution and the Constitution; laws of capitalism and slavery; jurisprudence of the Civil War and Reconstruction; legal education and the legal profession; the rise of the administrative state; the civil rights revolution and its aftereffects. HU

**HIST 169b, Early National America** Joanne Freeman

An introduction to America's first decades as a nation. Topics include the creation of a national politics, partisan conflict in the states and on a national level, the logistics of democratic politicking, and changes in American society and culture. HU  
History: Preindustrial

**HIST 184a / AFAM 160a / AMST 160a, The Rise and Fall of Atlantic Slavery**

Edward Rugemer

The history of peoples of African descent throughout the Americas, from the first African American societies of the sixteenth century through the century-long process of emancipation. HU

**HIST 191b / GLBL 264b, The United States and the World, 1776–1920** Patrick Cohrs

The transformation of the modern international system, and America's role in this system, from the eighteenth century to the Paris peace conference. Causes of international conflicts from the revolutionary wars of the 1700s to World War I, the Vienna and Versailles peace settlements, the Monroe Doctrine, imperialism in international politics, America's emergence as a world power, and Wilson's pursuit of a "peace to end all wars." Focus on the influence of ideas and learning processes on international history. HU

**HIST 202a, European Civilization, 1648–1945** John Merriman

An overview of the economic, social, political, and intellectual history of modern Europe. Topics include the rise of absolute states, the scientific revolution, the Enlightenment, the French Revolution and Napoleon, the industrial revolution, the revolutions of 1848, nationalism and national unifications, Victorian Britain, the colonization of Africa and Asia, fin-de-siècle culture and society, the Great War, the Russian Revolution, the Europe of political extremes, and World War II. HU

**HIST 206a, The Middle Ages, 300–1500** Anders Winroth

Introduction to the European Middle Ages. Topics include Rome's decline, the rise of Christianity, the spread of Islam, Charlemagne, Viking attacks, wars and the Crusades, the commercial revolution, saints, the culture of chivalry, the papacy, the invention of universities, the foundations for modern law, and early journeys of discovery. May not be taken after HIST 210 or 211. WR, HU

History: Preindustrial

**HIST 219a / ER&M 219a / JDST 200a / MMES 149a / RLST 148a, History of the Jews and Their Diasporas to Early Modern Times** Ivan Marcus

A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings. Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP

History: Preindustrial

**HIST 221a / GLBL 281a, Military History of the West since 1500** Paul Kennedy

A study of the military history of the West since 1500, with emphasis on the relationship between armies and navies on the one hand, and technology, economics, geography, and the rise of the modern nation-state on the other. The coming of airpower in its varied manifestations. Also meets requirements for the Air Force and Naval ROTC programs. HU

**HIST 223a, Renaissance Italy** Francesca Trivellato

An overview of the social, economic, political, and cultural dimensions of the Italian Renaissance. Topics include life in the city and the countryside; family and gender roles; marginal groups; religion; war and state-building; arts and sciences; and the Mediterranean and the New World. HU

History: Preindustrial

**HIST 228b, Vikings** Anders Winroth

Introduction to the history, literature, and culture of Scandinavia between 700 and 1250. Viking raids, skaldic and eddic poetry, Icelandic sagas, and northern myths; runestones, ships, halls, and swords in literature and history; Viking women, northern trade, colonization, Christianization, and Viking landings in America. HU

History: Preindustrial

**HIST 231b / GMAN 209b, War in Germany, 1648–2010** John Tooze

The rise and fall of modern militarism in Germany. Individual battles, soldiers, and weapons discussed within a broader context of the justification and regulation of state violence. Germany as a European battlefield, and as a nation that has perhaps come closest to drawing a final, concluding line under its military history. HU

**HIST 234b / HSHM 235b, Epidemics and Society in the West since 1600**

Frank Snowden

A study of the impact of epidemic diseases such as bubonic plague, cholera, malaria, and AIDS on society, public health, and the medical profession in comparative and international perspective. Topics include popular culture and mass hysteria, the mortality revolution, urban renewal and rebuilding, sanitation, the germ theory of



disease, the emergence of scientific medicine, and debates over the biomedical model of disease. HU

**HIST 236b / HSHM 226b / HUMS 342b, The Scientific Revolution** Paola Bertucci

The changing relationship between the natural world and the arts from Leonardo to Newton. Topics include the scientific revolution, Renaissance anatomy and astronomy, and alchemy and natural history. HU

History: Preindustrial

**HIST 237b / HUMS 285b / RSEE 390b / RUSS 241b, Russian Culture: The Modern**

**Age** Paul Bushkovitch and John MacKay

An interdisciplinary exploration of Russian cultural history, focusing on literature, art, religion, social and political thought, and film. Conceptions of Russian nationhood; the myths of St. Petersburg; dissent and persecution; the role of social and cultural elites; the intelligentsia; attitudes toward the common people; conflicting appeals of rationality, spirituality, and idealism; the politicization of personal life; the impact of the Bolshevik Revolution and its aftermath. HU

**HIST 246b / EVST 189b / HUMS 457b, The History of Food** Paul Freedman

The history of food and culinary styles from prehistory to the present, with a particular focus on Europe and the United States. How societies gathered and prepared food. Changing taste preferences over time. The influence of consumers on trade, colonization, and cultural exchange. The impact of colonialism, technology, and globalization. The current food scene and its implications for health, the environment, and cultural shifts. HU

**HIST 248b / JDST 293b / RLST 214b, Introduction to Modern Jewish Thought**

Eliyahu Stern

An overview of Jewish philosophical trends, movements, and thinkers from the seventeenth century to the twenty-first. Topics include enlightenment, historicism, socialism, secularism, religious radicalism, and Zionism. HU

**HIST 251a, Early Modern England: Politics, Religion, and Society under the Tudors and Stuarts** Keith Wrightson

An introduction to the development of English society in the sixteenth and seventeenth centuries—a period of social, political, economic, and cultural transition, and one that provided the immediate context of early British settlement in North America and the literature of the English Renaissance. HU

History: Preindustrial

**HIST 256b, Britain's Worlds, 1688 to the Present** Amanda Behm

The British empire and its relations with the world from 1688 to the present. Political, fiscal, and industrial revolution; the incomplete fall of Britain's North American empire; battles for dominance in Asia and Africa; metropolitan upheaval and reform; international citizenship and the global recasting of Britain in the twentieth century. Emphasis on enduring tension between liberal and fascist/authoritarian models of governance. HU

**HIST 261a / PLSC 176a, The Cold War** John Gaddis

The Cold War from beginning to end, viewed from the perspective of all its major participants, with emphasis on recently released Soviet, East European, and Chinese

sources. Counts toward either European or U.S. distributional credit within the History major, upon application to the director of undergraduate studies. HU, SO

**HIST 263a, Eastern Europe to 1914** Timothy Snyder

Eastern Europe from the medieval state to the rise of modern nationalism. The Ottoman Empire, the Polish-Lithuanian Commonwealth, the Hapsburg monarchy, and various native currents. Themes include religious diversity, the constitution of empire, and the emergence of secular political ideologies. HU

**HIST 264b, Eastern Europe since 1914** Timothy Snyder

Eastern Europe from the collapse of the old imperial order to the enlargement of the European Union. Main themes include world war, nationalism, fascism, and communism. Special attention to the structural weaknesses of interwar nation-states and postwar communist regimes. Nazi and Soviet occupation as an age of extremes. The collapse of communism. Communism after 1989 and the dissolution of Yugoslavia in the 1990s as parallel European trajectories. HU

**HIST 271b, European Intellectual History since Nietzsche** Marci Shore

Major currents in European intellectual history from the late nineteenth century through the twentieth. Topics include Marxism-Leninism, psychoanalysis, expressionism, structuralism, phenomenology, existentialism, antipolitics, and deconstruction. HU

**HIST 273a, Europe in the Age of Total War, 1914–1945** Jay Winter

A survey of European history that addresses the two world wars and the transformation of European society and culture between 1914 and 1945. HU

**HIST 277a, The Great Recession as History, 2007–2013** John Tooze

Introduction to the financial crisis that struck the United States and Europe in 2007 and that continues into the present day. Focus on how the current crisis is already being written into history. Ways in which the events are understood as historical; narratives of modern American and European history and models of historical change invoked by key commentators. Works by economists, economic historians, political scientists, and journalists. HU

**HIST 280a / HUMS 348a / RLST 160a, The Catholic Intellectual Tradition**

Carlos Eire

Introductory survey of the interaction between Catholicism and Western culture from the first century to the present, with a focus on pivotal moments and crucial developments that defined both traditions. Key beliefs, rites, and customs of the Roman Catholic Church, and the ways in which they have found expression; interaction between Catholics and the institution of the Church; Catholicism in its cultural and sociopolitical matrices. Close reading of primary sources. HU

**HIST 300b / CLCV 204b, Alexander the Great and the Hellenistic World**

Joseph Manning

The history and culture of the ancient world between the rise of Macedonian imperialism in the fourth century B.C.E. and the annexation of Egypt by Augustus in 30 B.C.E. Particular attention to Alexander, one of the most important figures in world history, and to the definition of "Hellenism." HU

History: Preindustrial

**HIST 303b, Japan's Modern Revolution** Daniel Botsman

A survey of Japan's transformation over the course of the nineteenth century from an isolated, traditional society on the edge of northeast Asia to a modern imperial power. Aspects of political, social, and cultural history. HU

**HIST 310a / SAST 221a, History of Modern South Asia** Julia Stephens

Survey of the Indian subcontinent's history from colonial rule, through nationalist resistance, to postcolonial history. The establishment of British dominion; colonial transformation of Indian politics, society, economy, and culture; nationalism before and after Gandhi; the partition of India; and recent developments in South Asia. HU

**HIST 317a / EAST 317a, China's Global Twentieth Century** Peter Perdue and Staff

The history of China from the Sino-Japanese war of 1895 to the post-Deng era in the twenty-first century. Focus on China's connections with the rest of the world and on the experiences of ordinary Chinese people during a time of tumultuous change. HU

**HIST 321b, China from Present to Past** Valerie Hansen and Peter Perdue

Underlying causes of current issues facing China traced back to their origins in the premodern period. Topics include economic development, corruption, environmental crises, gender, and Pacific island disputes. Selected primary-source readings in English, images, videos, and Web resources. HU

**HIST 323b, Southeast Asia since 1900** Benedict Kiernan

Comparative colonialism, nationalism, revolution, and independence in modern Southeast Asia. Topics include Indonesia and the Dutch, Indochina under French rule, the United States in the Philippines and Vietnam, Buddhism in Burma and Thailand, communist and peasant movements, and the Cambodian revolution and its regional repercussions. HU

**HIST 281a / RLST 268a, Christian Mysticism, 1200–1700** Staff

An introductory survey of the mystical literature of the Christian West, focusing on the late medieval and early modern periods. Close reading of primary texts, analyzed in their historical context. HU

History: Preindustrial

**HIST 325a, Introduction to Latin American History** Anne Eller

Critical themes and events in Latin American history from pre-Columbian times to the present. Major formative epochs such as the pre-Columbian era, colonization, independence, and contemporary moments; modern political flashpoints, including Haiti, Cuba, Argentina, and Peru. HU

**HIST 330a / CLCV 226a, Ancient Empires** Joseph Manning and François Gerardin

The history and institutions of empires in the ancient Near East, Egypt, and the Mediterranean world. Some comparison with other early empires in areas such as China. The roles of law, religion, and ethnicity and identity; economic institutions and structures. HU

**HIST 332a, African Encounters with Colonialism** Daniel Magaziner

How African societies and peoples encountered, engaged, and endured the colonial and postcolonial world, from the arrival of Kiswahili-speaking traders at the shores of Lake Victoria in the 1840s through the rise and fall of European colonialism and the resulting forms of neocolonialism. Transformations and continuities in African religious life; gendered sociability; popular culture. HU

**HIST 335b / AFST 335b, A History of South Africa** Daniel Magaziner

An introduction to the history of southern Africa, especially South Africa. Indigenous communities; early colonial contact; the legacies of colonial rule; postcolonial mismanagement; the vagaries of the environment; the mineral revolution; segregationist regimes; persistent inequality and crime since the end of apartheid; the specter of AIDS; postcolonial challenges in Zimbabwe, Angola, and Mozambique.

HU

**HIST 337b, The Mediterranean from the Crusades to Napoleon**

Francesca Trivellato and Alan Mikhail

Introduction to the history of the Mediterranean from the era of the Crusades to Napoleon's conquest of Egypt. Topics include city states and empires, religious conflict and coexistence, commerce, gender, military history, the arts, travel, piracy, and orientalism. Ways in which the study of the Mediterranean has shaped knowledge about the medieval, early modern, and modern worlds. HU

History: Preindustrial

**HIST 344b, Making of the Modern Middle East** Rosie Bsheer

Introduction to narratives and debates in the history of the Middle East from the mid-eighteenth century to the present. Local, regional, and global events and processes; political, social, cultural, and intellectual realities. Readings from the fields of history, anthropology, politics, and literature. HU

**HIST 345b / JDST 265b / MMES 148b / RLST 202b, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries** Ivan Marcus

Jewish culture and society in Muslim lands from the Prophet Muhammad to Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU RP

History: Preindustrial

**HIST 350a, Formation of the Islamic State, 610–750** Adel Allouche

The development of Islamic polity and society from the rise of Islam to the rise of the Abbasid dynasty. Religious and societal changes caused by the success of Muhammad's mission; ramifications of the subsequent Arab expansion at the expense of the Byzantine and Sasanian empires. The origins of Islamic institutions; the historical development of the main religious sects and of Islamic legal thought; Western views of Islam. HU

**HIST 358a / ER&M 341a / LAST 150a, History of Mexico since Independence**

Gilbert Joseph

Modern Mexico from the wars of independence in the early nineteenth century to the present. Social, cultural, and economic trends and their relationship to political movements; particular emphasis on the Revolution of 1910 and the long shadow it has cast, and on patterns of relations with the United States. HU

**HIST 361b / LAST 361b, History of Brazil** Stuart Schwartz

Brazilian history from European contact to the reestablishment of civilian government in the 1990s. Focus on the multiethnic nature of Brazilian society, the formation of social and political patterns, and the relationship of people to the environment. HU

**HIST 363b / LAST 364b, Latin America since Independence**

Marcela Echeverri Munoz

An introduction to Latin American history and its global implications, from nineteenth-century independence processes and creation of the region's nations to the twenty-first century. Focus on ways in which the flow of ideas, technology, and people has transformed Latin American politics. Topics include nationalism, race, ethnicity, revolution, development, and democracy. WR, HU

**HIST 396b / SAST 224b, India and Pakistan since 1947** Rohit De

Introduction to the history of the Indian subcontinent from 1947 to the present. Focus on the emergence of modern forms of life and thought, the impact of the partition on state and society, and the challenges of democracy and development. Transformations of society, economy, and culture; state building; economic policy. HU

**HIST 402a / HSHM 214a, Extraterrestrials in History** Ivano Dal Prete

The notion of extraterrestrials and "radical others" in history and culture from antiquity to the present. Topics include other worlds and their inhabitants in ancient Greece; medieval debates on the plurality of worlds; angels, freaks, native Americans, and other "aliens" of the Renaissance; comet dwellers in puritan New England; Mars as a socialist utopia in the early twentieth century; and visitors from space in American popular culture. HU

History: Preindustrial

**HIST 470a, World Finance, Mesopotamia to the Present**

Valerie Hansen and William Goetzmann

The history of finance from its earliest beginnings to the modern era, with particular attention to Mesopotamia, China, and Europe. The time value of money, including loans and interest; the negotiability of claims within a legal structure that handles claims; the ability to contract on future outcomes through life insurance and derivatives; corporations; causes and outcomes of economic bubbles. HU RP

## Departmental Seminars

All History majors must take at least two departmental seminars. Seminars on the history of the United States or Canada are numbered 100J to 199J; seminars on Britain and Europe are 200J to 299J; and seminars on Africa, Asia, Latin America, and the Middle East are 300J to 399J. Seminars numbered in the 400s address global topics; students must apply to the director of undergraduate studies in History to count a 400-level seminar toward a particular geographical distribution category. Each departmental seminar aims to acquaint students in a substantial and professional way with the literature of a period in history; to train them as far as possible in the use of primary source materials; to introduce them to problems of bibliography, historiography, and historical method; and to give them training in the writing of history. The relative importance of these objectives in any particular seminar depends on its subject matter, the previous preparation of its students, and the availability of materials.

Each term declared History majors should apply for departmental seminars for the following term using the online seminar preregistration site. Preregistration begins after midterm in the fall for seminars offered in the spring term, and after spring recess for seminars offered in the subsequent fall term. All students who wish to preregister must declare their major beforehand.

During the course selection period, application for admission should be made directly to the instructors of the seminars, who will admit students to remaining vacancies in their seminars. Priority is given to applications from juniors, then seniors, majoring in History, but applications are also accepted from qualified sophomores and from students majoring in other disciplines or programs. The department seeks wherever possible to accommodate students' preferences; for their part, students should recognize that limitations imposed by the size of seminars (normally fifteen students) make accommodation impossible in some instances. HIST 494 and residential college seminars that count toward the History major do not fulfill the departmental seminar requirement.

\* **HIST 111Ja / AFAM 380a / AMST 407a, Antebellum America** Edward Rugemer  
History of the United States from the Jackson administration through the Civil War. Emphasis on race, slavery, and the coming of the war, with some attention to western expansion. WR, HU  
History: Preindustrial

\* **HIST 113Ja / AMST 457a, Cultural Capital: New York in the Twentieth Century**  
Jean-Christophe Agnew  
An interdisciplinary study of New York City as a global cultural capital in the twentieth century. Social, political, and economic forces shaping the principal institutions of the city's patrician, popular, and mass cultures. The formation of identifiably "New York" styles in the arts, architecture, photography, literature, and film. The changing geography of cultural creation, reproduction, and distribution in the city. WR, HU

\* **HIST 129Ja / ER&M 129a, Topics in California History** Genevieve Carpio  
Twentieth-century California history, with an emphasis on Latino/a history. Themes include car culture, ethnic quarantines, tourism, and immigration enforcement at the U.S.-Mexico border. Use of traditional historical methods and new media. WR, HU

\* **HIST 130Jb / AMST 441b, Indians and the Spanish Borderlands** Ned Blackhawk  
The experiences of Native Americans during centuries of relations with North America's first imperial power, Spain. The history and long-term legacies of Spanish colonialism from Florida to California. WR, HU  
History: Preindustrial

\* **HIST 133Jb, The Creation of the American Politician, 1789–1820** Joanne Freeman  
The creation of an American style of politics: ideas, political practices, and self-perceptions of America's first national politicians. Topics include national identity, the birth of national political parties, methods of political combat, early American journalism, changing conceptions of leadership and citizenship, and the evolving political culture of the early republic. WR, HU  
History: Preindustrial

\* **HIST 134Ja, Yale and America: Selected Topics in Social and Cultural History**  
Jay Gitlin  
Relations between Yale and Yale people – from Ezra Stiles and Noah Webster to Cole Porter, Henry Roe Cloud, and Maya Lin – and American society and culture. Elihu Yale and the global eighteenth century; Benjamin Silliman and the emergence of American science; Walter Camp, Dink Stover, and the all-American boy; Henry Luce and the information age; faith and ideology in postwar Yale and America. WR, HU RP

\* **HIST 135Ja, The Age of Hamilton and Jefferson** Joanne Freeman

The culture and politics of the revolutionary and early national periods of American history, using the lives, ideas, and writings of Thomas Jefferson and Alexander Hamilton as a starting point. Topics include partisan conflict, political culture, nation building, the American character, and domestic life. WR, HU  
History: Preindustrial

\* **HIST 139Ja / AFAM 255a, The American South, 1870 to the Present**

Glenda Gilmore

A thematic approach to the history of the American South since Reconstruction. Focus on the political, social, and cultural history of a region that has undergone dramatic change. Topics include white supremacy and African American resistance, industrialization and labor activism, music and literature, the civil rights movement and the rise of the Republican South, and changing regional identity. WR, HU

\* **HIST 140Jb / HSHM 422b, Cartography, Territory, and Identity** William Rankin

Exploration of how maps shape assumptions about territory, land, sovereignty, and identity. The relationship between scientific cartography and conquest, the geography of statecraft, religious cartographies, encounters between Western and non-Western cultures, and reactions to cartographic objectivity. Students make their own maps. No previous experience in cartography or graphic design required. WR, HU

\* **HIST 141Ja / HSHM 411a, Science from Newton to Neutrons** William Summers

Major themes and ideas in science from the seventeenth century through the twentieth. Focus on evolving descriptions and theories of matter and energy, physics, and chemistry. The evolution of Newtonian ideas to the world of modern physics and the transition from alchemical thinking to the chemical revolution. WR, HU

\* **HIST 142Ja / HSHM 445a / WGSS 453a, Women and Medicine in America from the Colonial Era to the Present** Naomi Rogers

American women from the colonial era to the present as midwives, patients, healers, reformers, revolutionaries, innovators, and entrepreneurs. Ways that women have shaped American health care and medical research. WR, HU

\* **HIST 143Ja, Cultural History of Mental Illness in America** Stephen Vider

Conceptions and treatment of mental illness in the United States from the mid-1800s to the present. Variations in ideas about mental illness and social deviance over time and in different places; ways in which those ideas have shaped, and been shaped by, conceptions of race, gender, and sexuality; the treatment of mental illness as a form of social control. WR, HU

\* **HIST 149Ja / HSHM 410a, History of Pollution** Rachel Rothschild

The science and politics of pollution issues from the late nineteenth century through the end of the twentieth. The rise of antipollution regulations; the emergence of environmental social movements; the role of scientific expertise in national and international policymaking; changes in scientific, political, and public assessments of environmental risks. WR, HU

\* **HIST 159Ja / HSHM 459a / HUMS 359a, Spies, Secrets, and Science**

Paola Bertucci

The relationship between secrecy, intellectual property, and science from the Middle Ages to the Cold War. Topics include alchemy and esoteric knowledge; the Manhattan

Project and other secret scientific projects run by the state; the history of patents and copyright laws; and scientists as spies. WR, HU

\* **HIST 168Jb, Quebec and Canada from 1791 to the Present** Jay Gitlin

The history of Quebec and its place within Canada from the Constitutional Act of 1791 to the present. Topics include the Rebellion of 1837, confederation, the Riel Affair, industrialization and emigration to New England, French-Canadian nationalism and culture from Abbé Groulx to the Parti Québécois and Céline Dion, and the politics of language. Readings include plays by Michel Tremblay and Antonine Maillet in translation. WR, HU

\* **HIST 170Ja, Ideas and Ideologies in U.S. International History** Patrick Cohrs

The influence of American and foreign ideas and ideologies on U.S. international history. American assumptions about peace and international order from the days of the early republic and the Federalist Papers to the height of the Cold War. Emphasis on American responses to war and international crises, and on the impact of exceptionalist, imperialist, isolationist, "exemplarist," and capitalist ideologies on U.S. policy making.

WR, HU

\* **HIST 180Jb / EVST 443b, Energy in American History** Paul Sabin

The history of energy in United States since the early nineteenth century. America's global quest for oil; changing national energy policies; relations between energy producers and communities; political resistance to energy projects; and social, cultural, and environmental transformations associated with energy production and consumption. HU

\* **HIST 199Ja / ENGL 240a, Writing Narrative History** Edward Ball

Introduction to writing narrative nonfiction, including history, biography, and narrative journalism. The craft of turning real events, past or present, into plot- and character-driven stories. Reading of model texts, with attention to their use of character, making of scenes, point of view, structure, and dramatic moves. Students research, write, and revise their own nonfiction texts. Prerequisite: a 200-level English course or a History course. WR, HU, SO

\* **HIST 204Jb, History of Torture** Anders Winroth

The use of torture in Europe to extract confessions and testimony in criminal court cases from antiquity through the eighteenth century. The history of torture as a means for exploring the legal and social history of Europe. Topics include the use of pain to reach truth in the Roman Empire and in the Middle Ages, the early modern witch-hunting craze, and the movement to abolish torture during the Enlightenment. HU  
History: Preindustrial

\* **HIST 207Ja / CLCV 407a, Thucydides and the Peloponnesian War** Donald Kagan

A study both of the great war between Athens and Sparta that transformed the world of the Greek city-states and of the brilliant historian and political thinker who described it. HU

History: Preindustrial

\* **HIST 215Jb, The Art of Biography** John Gaddis

A comparative examination of successful as well as unsuccessful biographies, intended to identify both principles and pitfalls. WR, HU



- \* **HIST 217Ja / ENGL 197a, The Book in Early Modern Britain** Kathryn James  
The influence of the book in Britain from 1475 to 1660, including both manuscript and print formats. The book as material, cultural, and political object; its role in religious, political, and social transformations of the period. Focus on objects from Yale's British history and art collections. WR, HU  
History: Preindustrial
- \* **HIST 226Jb, Russia and the East** Jeremy Friedman  
The history of Russia's engagement with its non-European neighbors over the past millennium, including politics, economics, religion, culture, thought, and migration. Ways in which Asia and Russia have influenced each other. WR, HU
- \* **HIST 232Ja / HUMS 443a / JDST 270a / MMES 342a / RLST 201a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus  
How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP  
History: Preindustrial
- \* **HIST 233Ja, The Emergence of Modern Paris** John Merriman  
The economic, social, political, architectural, and cultural transformation of Paris from the Old Regime to the contemporary era. Topics include revolutionary Paris, the impact of rapid migration, the changing social geography of Paris in the time of Balzac and Zola, the rebuilding of Paris in the Second Empire, Paris and the impressionists, the emergence of the "red belt," and the successes and failures of twentieth-century planning. Reading knowledge of French helpful but not required. WR, HU
- \* **HIST 235Jb / HUMS 331b, Existentialism and Dissent** Marci Shore  
Intellectual history of twentieth-century Europe, focusing on existentialist philosophy and its confrontation with Marxism in theory and with communist regimes in practice. WR, HU
- \* **HIST 236Ja, The First World War** Pierre Purseigle  
The history of World War I explored in the context of the period between 1912 and 1923. Evolution of the historiography of the conflict since the late 1980s. WR, HU  
History: Preindustrial
- \* **HIST 247Ja / PLSC 303a, The Invention of Modern Democracy** Yiftah Elazar  
The reinvention of the classical idea of democracy as both a political institution and an ideal, from the seventeenth to the nineteenth century. Classical and neoclassical critiques of democratic government; revival and conceptual transformation in the Puritan, American, and French revolutions. Readings focus on Anglo-American political thought of the period, including its relation to classical, humanist, and contemporary continental sources. Counts toward either European or U.S. distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU  
History: Preindustrial

\* **HIST 250Jb / PLSC 321b, The Contested Idea of Liberty** Yiftah Elazar

The meaning and value of liberty in the seventeenth and eighteenth centuries, with a focus on the anglophone world. The relation of liberty to concepts such as virtue, reason, conscience, nature, law, property, arms, security, and independence; its contested role in debates on democratic participation, religious toleration, the corrective influence of commerce, the American Revolution, slavery, and the subjection of women; recent debates on liberty. Counts toward either European or U.S. distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU

History: Preindustrial

\* **HIST 253Ja, Culture, Dissidence, and Control in Golden Age Spain** María Jordán

Aspects of Spanish culture and society in the Golden Age (c. 1550–1650) that demonstrate discontent, dissidence, and suggestions for reform. Emphasis on the intersection of historical and literary sources and the dynamic between popular and elite cultures. WR, HU

History: Preindustrial

\* **HIST 254Jb / HSHM 468b, Sex, Life, and Generation** Ivano Dal Prete

Theories and practices of life, sex, and generation in Western civilization. Politics and policies of conception and birth; social control of abortion and infanticide in premodern societies; theories of life and gender; the changing status of the embryo; the lure of artificial life. HU

\* **HIST 255Jb, London and Modernity, 1880 to the Present** Becky Conekin

Aspects of modernity and the changing character of London as a metropolitan center from the late nineteenth century to the present. Social and economic development of the city, urban cultures, historical geography, sexuality, and the imperial and postimperial metropolis. WR, HU

\* **HIST 258Jb / JDST 278b / RLST 227b, Jewish Citizenship in Modern Europe**

Eliyahu Stern

Seventeenth- to twentieth-century responses to Jewish citizenship in modern European states. Religious law; modern Jewish identity; Zionism; Judaism as a religion vs. a nation; the place of minorities in contemporary Europe. WR, HU

\* **HIST 269Jb, History and Holocaust Testimony** Carolyn Dean

The history and memoirs of Holocaust testimony. Ways in which victims' experiences are narrated and assessed by historians. Questions regarding memory and history. May not be taken after HIST 027. WR, HU

\* **HIST 270Ja, Philosophy of History in Central Europe** Marci Shore

Ways in which central European philosophers before, during, and after the communist period grappled with the meaning of history, the role of the individual within history, and the space for ethics within historical determinism. Philosophy of history as an aspect of, and response to, the totalitarian experiments of the twentieth century. WR, HU

\* **HIST 271Ja, Communism in Eastern Europe** Timothy Snyder and Sara Silverstein

The origins and evolution of communism in eastern Europe after World War II explored from political, cultural, social, and intellectual perspectives. Methods of establishing authoritarian government; the effects of such government on different

social groups; the dynamics of national versus Soviet communism; the legacy of interwar nation-states and wartime occupation by Nazi and Soviet regimes. WR, HU

\* **HIST 272Ja, Russia in the Age of Revolution, 1890–1924** Staff

The end of the Russian empire and the creation of the Soviet Union, including World War I, the Russian Civil War, and three major revolutions. Processes and forces that led to massive political and social changes between 1905 and 1924; connections among radical ideas, social movements, war, and political change. WR, HU

\* **HIST 273Jb, Magic, Science, and Medicine in the Middle Ages**

Agnieszka Rec and Katherine Hindley

The blurred boundaries and shifting relations between magic, science, and medicine in medieval Europe. Healing miracles; rationality of magic, medicine, and science; magical books and books of magic; alchemy and astrology; technology as magic; necromancers and witches; persecution. Extensive use of materials from the Beinecke Library. WR, HU

History: Preindustrial

\* **HIST 274Jb, Stalin and the Soviet Union, 1920–1939** Staff

The Soviet Union under Joseph Stalin, including the violent collectivization of agriculture, rapid industrialization, the Great Terror, and the introduction of mass education and literacy. The creation of the Stalinist state and the so-called revolution from above; how people lived and understood the Soviet experience; achievements sought by the Soviet experiment; the relationship between Leninism and Stalinism.

WR, HU

\* **HIST 326Ja / EAST 326a, Yale and Japan** Daniel Botsman

Exploration of Yale's rich historical connections to Japan. Focus on use of the University's museum and library collections to learn about various aspects of the Japanese past, from ancient times to the post-World War II era. Knowledge of Japanese helpful but not required. WR, HU

\* **HIST 327Jb / EAST 447b, Civilization in Meiji Japan** Kazumi Hasegawa

Transformations in Japanese daily life, culture, politics, and economics during the Meiji period. Ways in which particular concepts and identities were shaped and constructed, including gender, sexuality, ethnicity, time, and language. The influence of Meiji Japan on modern Japanese history and society. HU

History: Preindustrial

\* **HIST 332Ja / EAST 444a / EVST 323a, China's Environmental History since 1600**

Jonathan Schlesinger

Recent scholarship on climate change, resource management, water conservancy, public sanitation, and the shifting meanings of nature in Chinese culture and science from the early modern period to the present. Ways in which Chinese history and the natural environment have shaped one another; relations between China's environmental history and contemporary global trends. HU

\* **HIST 347Ja / MMES 147a, The Ottoman Empire** Alan Mikhail

Major trends in Ottoman history and historiography. The political and imperial history of the ruling Ottoman elite; the culture, politics, and realities of marginal groups such as peasants, women, and minorities. The complex web of relationships between the state and its bureaucrats, peasants, judges, families, and merchants. WR, HU

History: Preindustrial

\* **HIST 362Ja, Cold War in the Third World** Jeremy Friedman

The collapse of colonial empires and the emergence of Asia, Africa, and Latin America during the Cold War. Attempts to develop political and economic systems while negotiating factors such as revolution, socialism, religion, and geopolitics. Conceptual discourses within and without the developing world surrounding issues such as independence, nationalism, racial identity, violence, social and political order, and economic justice and growth. WR

\* **HIST 372Ja / ER&M 342a / LAST 372a, Revolutionary Change and Cold War in Latin America** Gilbert Joseph

Analysis of revolutionary movements in Latin America against the backdrop of the Cold War. Critical examination of popular images and orthodox interpretations. An interdisciplinary study of the process of revolutionary change and cold war at the grassroots level. WR, HU

\* **HIST 377Ja / LAST 377a, Freedom and Abolition in Latin America**

Marcela Echeverri Munoz

The history of freedom in Latin America, with a focus on issues surrounding slavery and abolition. The rise of slavery and slave societies across the region, including context within the founding of European empires in the Americas. Ways in which the lives of freed slaves in Latin America represented a practical freedom that preceded the emergence of Enlightenment abolitionism in the nineteenth century. Relations between black politics, revolution, liberalism, and opposition to slavery. WR, HU

History: Preindustrial

\* **HIST 384Jb / MMES 172b / NELC 403b, The Middle East between Crusaders and Mongols** Adel Allouche

The impact of the Crusades and the Mongol conquests on the Islamic Middle East. Political, social, and economic changes in the region from the eleventh century to the middle of the fourteenth. Emphasis on the rise of new dynasties as a result of changes in the ethnic mosaic of the Middle East. WR, HU

History: Preindustrial

\* **HIST 385Ja, Reformers and Revolutionaries in the Arab World** Rosie Bsheer

Major social and intellectual trends of the Arab world and their relation to major events and movements of the twentieth century. The influence of colonial, postcolonial, and neocolonial thought; issues faced by activists, lawyers, feminists, leftists, nationalists, Islamists, secularists, liberals, and unionists; ways in which such struggles shaped people's social lives and futures; the causes and implications of current uprisings. WR, HU

\* **HIST 388Ja / AFST 486a, Slavery and the Slave Trade in Africa** Robert Harms

The slave trade from the African perspective. Analysis of why slavery developed in Africa and how it operated. The long-term social, political, and economic effects of the Atlantic slave trade. WR, HU

History: Preindustrial

\* **HIST 398Jb / MMES 173b / NELC 404b, Mamluk Egypt** Adel Allouche

A study of the Mamluks, manumitted slaves initially imported to Egypt for military service who established their own rule over Egypt and Syria (1250–1517). Focus on the structure and workings of the Mamluk state. Military, political, economic, and social

factors that contributed to the grandeur and, later, the decline of the Mamluk period in Egypt and its conquest by the Ottoman Turks. WR, HU  
History: Preindustrial

\* **HIST 409Ja / AFST 150a, Global Black Power** Daniel Magaziner

The global dimension of black people's struggles for self-determination and authority from the late eighteenth century to the present. Various experiences of, and responses to, slavery, emancipation, segregation, scientific racism, and enlightenment democracy. The Haitian revolution, the Back to Africa movement, Garveyite nationalism, religious expression, African independence, armed revolution, and urban politics. WR, HU

\* **HIST 411Ja, The Global 1960s** Jenifer Van Vleck

A comparative, transnational study of the social, political, and cultural upheavals that occurred during the 1960s, including decolonization, the African American freedom struggle, the Prague Spring, China's Cultural Revolution, and protest movements in the United States, eastern and western Europe, and Latin America. The "other" side of the 1960s—a decade that ended with the presidency of Richard Nixon and the ascendance of conservative regimes in numerous Western countries—and its representation in contemporary culture. May count toward geographical distributional credit within the History major for any region studied, upon application to the director of undergraduate studies. WR, HU

\* **HIST 415Ja / AMST 318a, The Problem of Global Poverty** Joanne Meyerowitz

Large-scale plans to end world poverty from 1960 to the present, from modernization to microcredit. Topics include the green revolution, population control, the "women in development" movement, and the New International Economic Order. Extensive work with primary sources. May count toward geographical distributional credit within the History major for any region studied, upon application to the director of undergraduate studies. WR, HU

\* **HIST 420Ja / HSHM 469a, Photography and the Sciences** Staff

The making of photography's discursive identity as an experimental and evidentiary medium in the sciences, from its announcement to the public in 1839 to the digital innovations of the present. Historical and archival perspectives on uses for photography in different fields of the natural and human sciences. Use of photographic image collections in the Peabody Museum and the Beinecke Library. WR, HU

\* **HIST 422Jb / AMST 480b, Theories of History** Greta LaFleur

Critical, philosophical, and theoretical survey of history as an idea and a practice. The intellectual genealogy behind the historiographic practices used and discussed most often in contemporary scholarship, including new historicism and queer historiography. The problem of describing the nature, uses, and abuses of history. Readings from works by Socrates, Hegel, Marx, Freud, Benjamin, Foucault, Scott, White, Said, and Spivak.

\* **HIST 431Jb, Family and Empire** Julia Stephens

The role of families in the production and reproduction of political and economic power from the imperial harems of early modern empires to dynastic families in contemporary politics. Focus on Asia and the British Empire. Histories of dynastic, colonial, mixed-race, diasporic, and merchant families. Sources include biographies, obituaries, letters, legal documents, and novels. WR, HU

\* **HIST 435Jb / HSHM 437b, The Global Crisis of Malaria** Frank Snowden

The global crisis of malaria examined in comparative and historical context. The mosquito theory of transmission and other developments in scientific understanding of the disease; World Health Organization strategies to eradicate malaria since 1955; the development of tools such as insecticides, medication, and bed nets; the attempt to create an effective vaccine. WR, HU

\* **HIST 456Jb / HSHM 466b, The Great Flood and Other Catastrophes**

Ivano Dal Prete

The influence on human culture and society of major geological events and of ideas on the history of the Earth. Emphasis on the analysis of objects in the collections of Yale's museums and libraries, including fossils, rare books, and visual representations of natural phenomena. WR, HU

\* **HIST 464Ja, Law and History** Rohit De

The role of law and legal institutions in shaping everyday life. Ways in which societies throughout history have engaged with law, rules, and legal institutions, from the Roman Empire to Ottoman Egypt to the U.S. civil rights era. Methodologies and sources in the study of legal history. WR, HU

## Writing Tutorial and Senior Essay Courses

\* **HIST 494a, Individual Writing Tutorial** Beverly Gage

For students who wish, under the supervision of a member of the faculty, to investigate an area of history not covered by regular departmental offerings. The course may be used for research or for directed reading. It is normally taken only once. The emphasis of the tutorial is on writing a long essay or several short ones. To apply for admission, a student should present the following materials to the director of undergraduate studies on the Friday before schedules are due: a prospectus of the work proposed, a bibliography, and a letter of support from a member of the History department faculty who will direct the tutorial. A form to simplify this process is available from the office of the director of undergraduate studies.

\* **HIST 495a or b and HIST 496a or b, The Senior Essay** Valerie Hansen

All senior History majors should attend the mandatory senior essay meeting on Monday, September 8, 2014, at 12:30 p.m. in a location to be announced. The senior essay is a required two-term independent research project conducted under the guidance of a faculty adviser. As a significant work of primary-source research, it serves as the capstone project of the History major. The essay takes the form of a substantial article, not longer than 12,500 words (approximately forty double-spaced typewritten pages). This is a maximum limit; there is no minimum requirement. Length will vary according to the topic and the historical techniques employed. Students expecting to graduate in May enroll in HIST 495a during the fall term and complete their essays in HIST 496b in the spring term. December graduates enroll in HIST 495b in the spring term and complete their essays in HIST 496a during the following fall term; students planning to begin their essay in the spring term should notify the senior essay director by December 1, 2014. Each student majoring in History must present a completed Statement of Intention, signed by a department member who has agreed to serve as adviser, to the undergraduate History administrator in 237 HGS no later than September 15, 2014 (for HIST 495a) or January 6, 2015 (for 495b). Blank statement forms are available in 237 HGS and in the Senior Essay handbook. Students enrolled

in HIST 495 submit to the administrator in 237 HGS a two-to-three-page analysis of a single primary source and a draft bibliographic essay by the announced deadlines, and at least ten pages of the essay by December 1, 2014 (495a), or May 4, 2015 (495b). Those who meet these requirements receive a temporary grade of SAT, which will be changed to the grade received by the essay upon its completion. Failure to meet any requirement may result in the student's being asked to withdraw from HIST 495. Students enrolled in HIST 496 must submit a completed essay to 211 HGS no later than 5 p.m. on April 6, 2015, in the spring term, or no later than 5 p.m. on December 1, 2014, in the fall term. Essays submitted after 5 p.m. will be considered as having been turned in on the following day. If the essay is submitted late without an excuse from the student's residential college dean, the penalty is one letter grade for the first day and one-half letter grade for each of the next two days past the deadline. No essay that would otherwise pass will be failed because it is late, but late essays will not be considered for departmental or Yale College prizes. All senior departmental essays will be judged by members of the faculty other than the adviser. In order to graduate from Yale College, a student majoring in History must achieve a passing grade on the departmental essay.

## History of Art

Director of undergraduate studies: Mimi Yiengpruksawan, 653 LORIA, 432-2682, [mimi.yiengpruksawan@yale.edu](mailto:mimi.yiengpruksawan@yale.edu); [arthistory.yale.edu](http://arthistory.yale.edu)

### FACULTY OF THE DEPARTMENT OF HISTORY OF ART

**Professors** Carol Armstrong, Tim Barringer, Edward Cooke, Jr., Diana Kleiner, Kobena Mercer, Amy Meyers (*Adjunct*), Mary Miller, Robert Nelson, Jock Reynolds (*Adjunct*), Vincent Scully (*Emeritus*), Robert Thompson, Christopher Wood, Mimi Yiengpruksawan

**Associate Professors** Milette Gaifman, Jacqueline Jung, Kishwar Rizvi

**Assistant Professors** Craig Buckley, J. D. Connor, Erica James, Joost Keizer, Youn-mi Kim, Jennifer Raab, Tamara Sears, Sebastian Zeidler

**Lecturers** Theresa Fairbanks-Harris, Karen Foster, John Stuart Gordon, Ian McClure, David Sensabaugh

Art history is the study of all forms of art, architecture, and visual culture in their social and historical contexts. The History of Art major can serve either as a general program in the humanities or as the groundwork for more specialized training. Unless otherwise indicated, all courses in History of Art are open to all students in Yale College.

**Requirements of the major** Twelve course credits are required to complete the major: two introductory courses at the 100 level; four intermediate and advanced courses at the 200–300 level; two seminars at the 400 level; a methods seminar, HSAR 401; two electives; and the senior essay, HSAR 499.

100-level courses are broad introductory surveys that address basic art history from a number of regional and thematic perspectives. Prospective majors are encouraged to take the surveys as early in their course of study as possible. Students who have taken the Advanced Placement test in art history may earn acceleration credit and, in

consultation with the director of undergraduate studies, may place out of a 100-level course.

Intermediate and advanced courses, numbered above 200, encompass more specialized surveys and themes in art history. The major requires six courses numbered above 200, of which two must be seminars numbered above 400; the six courses must satisfy both a geographical and a chronological distributional requirement. The geographical requirement is divided into five areas: Africa and the Pacific; the Americas; Asia and the Near East; Europe; and transregional. The chronological requirement is similarly divided into five segments: earliest times to 800; 800–1500; 1500–1800; 1800 to the present; and transchronological. The six intermediate and advanced courses must be chosen from four different geographical areas and four different time periods; a single course can fulfill both a geographical and a chronological requirement.

The methods seminar HSAR 401, *Critical Approaches to Art History*, is a wide-ranging introduction to the practices of the art historian and the history of the discipline. It is to be taken during the fall or spring term of the junior year.

Electives may include courses from other departments if they have direct relevance to the major program of study. Approval of the director of undergraduate studies is required.

History of Art majors are urged to study foreign languages. Students considering graduate work should discuss with their advisers the appropriate language training for their field of interest.

**Senior essay** The senior essay is a research paper written usually in one term in HSAR 499. Students choose their own topics, which may derive from research done in an earlier course. The essay is planned during the previous term in consultation with a qualified instructor or with the director of undergraduate studies. It is also possible to write a two-term senior essay, with permission of the director of undergraduate studies. Students wishing to write a two-term essay must submit a petition to the director of undergraduate studies and the prospective adviser, normally by the first week after spring break of the junior year.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

**Procedures** The schedules of all majors must be approved and signed by the director of undergraduate studies. Students may consult the following members of the faculty about the major:

BK	K. Rizvi	MC	to be announced
BR	M. Gaifman	PC	D. Kleiner
CC	C. Wood	SY	M. Miller
DC	E. Cooke	SM	S. Zeidler
TD	R. Thompson	ES	M. Yiengpruksawan
JE	T. Sears	TC	T. Barringer



**Graduate courses** Courses in the Graduate School are open to undergraduates with permission of the instructor and of the director of graduate studies. Course descriptions are available in the History of Art office in the Jeffrey Loria Center, 190 York Street.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 course credits

**Distribution of courses** 2 courses at 100 level; 6 courses numbered above 200, 2 of which must be 400-level seminars, fulfilling distributional requirements in 4 geographical and 4 chronological categories; 2 electives

**Specific course required** HSAR 401

**Substitution permitted** With DUS permission, 2 electives from related depts

**Senior requirement** Senior essay (HSAR 499)

## Courses

### **HSAR 110b / ARCG 110b, Introduction to the History of Art: Global Decorative Arts**

Edward Cooke

Global history of the decorative arts from antiquity to the present. The materials and techniques of ceramics, textiles, metals, furniture, and glass. Consideration of forms, imagery, decoration, and workmanship. Themes linking geography and time, such as trade and exchange, simulation, identity, and symbolic value. HU

### **HSAR 112a, Introduction to the History of Art: Prehistory to the Renaissance**

Milette Gaifman and Jacqueline Jung

Form as meaning in architecture, sculpture, and painting. Selected studies in these arts from prehistory to the Renaissance. Source readings in translation. HU

### **HSAR 115b, Introduction to the History of Art: Renaissance to the Present**

Tim Barringer

Painting, sculpture, and graphic arts, with some reference to architecture. Selected major works and artists treated in terms of form, function, and historical context. Introduction to visual analysis. Special attention to contact between Europe and its others. HU

### **HSAR 202a / ARCG 202a, Pre-Columbian Architecture** Mary Miller

A survey of pre-Columbian architecture and city planning from the Andes to the southwestern United States. Principal sites considered include Machu Picchu, Cuzco, Tiwanaku, Chichen Itza, Tikal, Monte Alban, Teotihuacan, Mesa Verde, and Pueblo Bonito. Attention to domestic architecture, construction techniques, and archaeoastronomy. HU

### \* **HSAR 207b / ART 202b / WGSS 204b, Feminist Theory and Feminist Art**

Susan Cahan

Major issues in feminist theory and art practice since the 1960s. Topics include women's art of the 1960s and 1970s, performance and body art, representation and the social construction of gender, and the intersection of gender, race, sexuality, and class. Materials fee: \$25. HU RP

**HSAR 211b, Modernism and Modernity in America** Jennifer Raab

Twentieth-century American art and its cultural contexts. Abstraction in painting and photography; the Harlem Renaissance and collaboration between artists and writers; public space and the politics of mural painting; pop art and the appropriation of mass media imagery; the subversion or rejection of the white-walled museum. Close analysis of works from Yale University Art Gallery collections. HU

**HSAR 217a, American Art and Visual Culture to 1900** Jennifer Raab

Survey of American art, from colonization and revolution to the emergence of modernism at the turn of the twentieth century. The role of art and visual culture in shaping American history. Focus on works from Yale University Art Gallery collections; artists include John Trumbull, John Singleton Copley, Frederic Church, Winslow Homer, Mary Cassatt, and Thomas Eakins. HU

**\* HSAR 218La / MB&B 218La, Art and Biomolecular Recognition Laboratory**

Andrew Miranker

Students create and execute original projects in materials science using biotechnological tools. Introduction to the technical examination of art, with analysis of works from Yale University Art Gallery collections; the chemical basis of artist's materials; applied techniques in biomolecular evolution. Enrollment limited. Preference to students with a strong high-school background or college-level course work in chemistry and/or biology. SC

**HSAR 221b / HUMS 220b / RUSS 220b, Russian and Soviet Art, 1757 to the Present**

Molly Brunson

The history of Russian and Soviet art from the foundation of the Academy of the Arts in 1757 to the present. Nineteenth-century academicism, romanticism, and realism; the Russian avant-garde and early Soviet experimentation; socialist realism and late- and post-Soviet culture. Readings and discussion in English. HU TR

**HSAR 234a / ARCG 221a / NELC 120a, Egyptomania** Colleen Manassa

Conceptual underpinnings of the use of ancient Egyptian motifs in architecture, painting, sculpture, and decorative arts throughout western Europe, the Middle East, and North America from antiquity to the present. HU

**HSAR 236a / ARCG 236a / NELC 103a, The Art of Ancient Palaces** Karen Foster

Introduction to the art and architecture of palaces in ancient Egypt, Mesopotamia, and the Bronze Age Aegean. Special attention to palatial workshops (painting, sculpture, pottery, faience, glass, ivory, metal) in cultural context. Emphasis on the iconography of power, including the establishment within palatial complexes of the world's oldest botanical and zoological gardens. HU

**HSAR 239b / ARCG 239b / HUMS 252b / NELC 104b, Art of the Ancient Near East and Aegean** Karen Foster

Introduction to the art and architecture of Mesopotamia, Egypt, and the Aegean, with attention to cultural and historical contexts. HU

**HSAR 250a / ARCG 170a / CLCV 170a, Roman Art: Empire, Identity, and Society**

Diana Kleiner

Masterpieces of Roman art from the Republic to Constantine studied in their historical and social contexts. The great Romans and the monuments they commissioned—portraits, triumphal arches, columns, and historical reliefs. The concept of empire and

imperial identity, politics and portraiture, the making and unmaking of history through art, and the art of women, children, freedmen, and slaves. HU

\* **HSAR 251a / FREN 366a / HUMS 167a, Writers and Artists in Paris, 1780–1914**

Marie-Hélène Girard

Ways in which the transformation of Paris shaped the representation of artists who lived and worked in the French capital from the end of the Old Regime until the eve of World War I. The emergence of Paris as a cultural marker; the role played by the image of the bohemian or the *artiste maudit*. Authors and artists include David, Balzac, Delacroix, Baudelaire, Manet, Mallarmé, impressionist painters, and Picasso. L5, HU

**HSAR 252b / ARCG 252b / CLCV 175b, Roman Architecture** Diana Kleiner

The great buildings and engineering marvels of Rome and its empire. Study of city planning and individual monuments and their decoration, including mural painting. Emphasis on developments in Rome, Pompeii, and central Italy; survey of architecture in the provinces. HU

**HSAR 286b, Renaissance and Baroque Sculpture** Joost Keizer

The history of Italian Renaissance sculpture from 1300 to 1650. Topics include individual artists (the Pisani, Donatello, Michelangelo, Bernini); medium specificity (marble, bronze, terracotta, wood); the imitation of antique art; animation; and the nude. Field trip to the Metropolitan Museum of Art in New York. HU

**HSAR 288a, Renaissance and Baroque Drawing** Kishwar Rizvi

The history of drawing from its first systematic application in the early fifteenth century through the late seventeenth century. Focus on southern and northern European artists. Transregional comparison of the development and use of drawing; different functions of drawing, from the invention of the quick sketch to highly detailed work; drawing techniques, from pen to charcoal. Artists include van Eyck, Leonardo, Raphael, Michelangelo, Dürer, Poussin, Velazquez, and Rembrandt. Includes visits to museums in New York. HU

**HSAR 291b / HUMS 235b, Buildings and Power in Italy** Mia Reinoso Genoni

Investigation of how architecture and monumental sculpture are expressions of power in Italy, c. 1220–1660. Focus on works built by civil and religious authorities. Ways in which buildings create or solidify power; strategies available to rulers and authorities; relations between patron and architect; demonstrations of changes in power through the use of both traditional and innovative architectural idioms; contemporary interpretations, understandings, and rejections of monumental statements of power.

HU

**HSAR 306a, Art and the British Empire, 1600–1997** Tim Barringer

The visual culture of the British Empire on four continents, with reference to themes such as exploration, conquest, slavery, orientalism, commerce, and settlement. Focus on questions of race and representation. Study of original paintings, works on paper, and photographs in the Yale Center for British Art. HU

\* **HSAR 310b / HUMS 270b, Futurism: The Shock of the New** Amerigo Fabbrì

Cultural and intellectual shifts in literature, philosophy, and the arts at the end of the nineteenth century, marking the rise of modernism. Futurism, surrealism, and other avant-garde movements that transformed into art the dramatic challenges of a new technological and psychological reality. HU

**HSAR 312a, Modern Architecture, 1890–1980** Craig Buckley

Architects, movements, and buildings central to the development of modern architecture from the late nineteenth century through the 1970s. Common threads and differing conceptions of modern architecture. The relationship of architecture to urban transformation; the formulation of new typologies; architects' responses to new technologies and materials; changes in regimes of representation and media. Architects include Adolf Loos, Frank Lloyd Wright, Le Corbusier, Ludwig Mies van der Rohe, and Louis Kahn. HU

**\* HSAR 325b / ARCH 261b, History of Architecture II: The Eighteenth Century to the Millennium** Eeva-Liisa Pelkonen

Modern architecture and urbanism from the eighteenth century to the end of the twentieth. Genesis and meaning of architectural form, applying national, cultural, and international contexts. HU

**HSAR 326a / FILM 335a, Classical Hollywood: Art and Industry** John Connor

Classical Hollywood studios as factories of aesthetic achievement and cultural dominance. Challenges to studios, including technical (the coming of sound, color, and widescreen), industrial (the production code, antitrust litigation, and the blacklist), and cultural (the Depression, World War II, and the rise of television). Landmark films from *The Jazz Singer* and *Citizen Kane* to *Casablanca* and *Rebel without a Cause*. HU

**HSAR 327b / FILM 345b, Film Theory, Criticism, and Culture** Joshua Glick

Survey of the major theories, questions, and debates surrounding cinema from the inception of the medium in the late nineteenth century to the present. Readings from articles and essays written by intellectuals, filmmakers, artists, critics, social scientists, and scholars from across the globe whose ideas have shaped understandings of moving images and their impact on society. Recommended preparation: FILM 150. HU

**HSAR 345b, Nineteenth-Century Photography** Carol Armstrong

The beginnings of photography in the nineteenth century; developments in the medium in England, France, and the United States. Forms, functions, and genres of the early photograph, including scientific specimen, book illustration, portrait, tableau, and work of art. HU

**HSAR 373b / AFAM 215b, African American Art, 1963 to the Present** Erica James

Modern African American artistic production explored in the context of American art and social history. Critical race theory and artistic discourse from the Spiral group in 1963, to the Black Arts Movement and the culture wars, to current readings in American and postblack art. The complicated relations between African American art and politics. Use of art objects from the Yale University Art Gallery. HU

**HSAR 375a / AFAM 183a, Afro-Modernism in the Twentieth Century**

Kobena Mercer

Introductory survey of African American, Caribbean, and black British artists in the context of modernism and postmodernism. Cross-cultural dynamics in the aesthetics and politics of race and representation. HU

**HSAR 378b / AFAM 178b / AFST 188b / ER&M 278b, From West Africa to the Black Americas: The Black Atlantic Visual Tradition** Robert Thompson

Art, music, and dance in the history of key classical civilizations south of the Sahara—Mali, Asante, Dahomey, Yorùbá, Ejangham, Kongo—and their impact on New World art

and music, especially rock, blues, North American black painting of the past ten years, and black artists of Cuba, Haiti, and Brazil. HU

**HSAR 379a / AFAM 112a, New York Mambo: Microcosm of Black Creativity**

Robert Thompson

The rise, development, and philosophic achievement of the world of New York mambo and salsa. Emphasis on Palmieri, Cortijo, Roena, Harlow, and Colón. Examination of parallel traditions, e.g., New York Haitian art, Dominican merengue, reggae and rastas of Jamaican Brooklyn, and the New York school of Brazilian capoeira. HU

**\* HSAR 386a / ANTH 384a / RLST 301a, Art and Ritual in Tribal India** Staff

Introduction to aesthetic practices performed in a ritual context by tribal groups in India. Focus on ways in which paintings, sculptures, songs, and dances function as mediums through which the divine is materialized. The influence of patrimonialization and commoditization on the production and meaning of ritual objects and images. HU

**HSAR 387a, Architecture in the Indian Subcontinent** Tamara Sears

The history of architecture and the built environment in the Indian subcontinent from ancient times to the present. Sacred and secular buildings; design principles and ornamental programs; urban forms; landscape; modern revivals; colonial and postcolonial engagements with past architectural traditions.

**\* HSAR 401a or b, Critical Approaches to Art History** Staff

A wide-ranging introduction to the methods of the art historian and the history of the discipline. Themes include connoisseurship, iconography, formalism, and selected methodologies informed by contemporary theory. WR, HU

**\* HSAR 403a, Observation and Analysis** Theresa Fairbanks

A survey of the techniques and materials employed in Western painting, sculpture, and graphic arts from antiquity to the present. Modern examination techniques analyzed as tools for connoisseurship, dating, and authentication, including study of age, damage, and restoration as they change works of art. General concepts of preservation and conservation. HU RP

**\* HSAR 419a / CLCV 282a, Art and Culture in the Roman Provinces** Lisa Brody

The diversity of identities created by the interaction of Roman imperial culture and local traditions in the Roman provinces. Issues related to daily life, politics, technology, and religion. Close work with objects from the Yale University Art Gallery, including mosaics, ceramics, glass, textiles, coins, and jewelry.

**\* HSAR 423a / CLCV 268a, The Art of Dionysos: Drink, Drama, and Ecstasy**

Milette Gaifman

Artifacts of Greek art and architecture made in honor of Dionysos, the god of wine and theater, whose worship involved ecstatic experiences. The Great Dionysia, a festival where theatrical productions were performed, as the source of inspiration for artifacts and architectural monuments. Objects and structures such as painted vases and theaters as means of keeping the realm of Dionysos present in daily experience. HU

**\* HSAR 424b / ARCG 424b, eClavdia: Women in Ancient Rome** Diana Kleiner

The contributions of Roman women to one of the greatest cities—and one of the greatest empires—in world history. Lost stories of real-life Roman women recovered from public and residential buildings, portraits, paintings, and other works of Roman art and architecture. HU RP

\* **HSAR 430a, Painting and Poetry in Islamic Art** Kishwar Rizvi

Relations between the literary and visual arts in the medieval and early modern Islamic world. Focus on the arts of Iran, Turkey, and India. Study of materials from collections at the Yale University Art Gallery and the Beinecke Rare Book and Manuscript Library. Includes a field trip to the Metropolitan Museum of Art in New York. HU

\* **HSAR 434a / HUMS 273a, Michelangelo** Joost Keizer

Central problems of current research on Italian Renaissance art approached both through the works of Michelangelo, the Renaissance artist who reflected most profoundly on the nature of art, and through their historiography. Includes a daylong excursion to New York City to view works by Michelangelo. HU

\* **HSAR 440a, Nineteenth-Century Sculpture** Tim Barringer

Major developments in the history, theory, and practice of sculpture from the Napoleonic era to 1900, with a focus on British and American works. Materials and techniques; the terms and labels used to classify periods, styles, and types of production; taxonomies of sculpture in museums; debates about aesthetics; sculpture's role in an industrial world. Close analysis of works from Yale's art museums, as well as field trips to New York and Massachusetts. HU

\* **HSAR 450b, Seventeenth-Century Dutch Painting** John Walsh

Study of painting in the Dutch Republic, with a focus on its rapid growth and diversification from 1610 to 1650. Geography, wealth, and national self-regard in Dutch art; the concept of realism; the depiction of local, foreign, and fictional places; attitudes toward the material world; narrative painting; images of bad and exemplary behavior; portraiture; painting techniques. Includes a field trip to the Metropolitan Museum of Art in New York. Prerequisite: HSAR 112 or equivalent. Reading knowledge of German useful but not required.

\* **HSAR 454a / ARCH 355a / EAST 446a, South Korean Urbanism** Staff

Modern and contemporary South Korean urbanism and its relation to discourses of the everyday. Focus on Seoul as a case study, with attention to commercial environments, ephemeral urban events, and local street cultures. Key texts by philosophers, historians, architectural theorists, and art historians analyzed in the context of artistic and architectural responses to Seoul's urbanism in recent decades. HU

\* **HSAR 466b, The Technical Examination of Art** Ian McClure

Introduction to methods used in the technical examination of works of art, including critical assessment of the information such methods provide. What technical examination can reveal about the materials and techniques used in a particular work's creation and about its subsequent history.

\* **HSAR 467a / AMST 449a / WGSS 451a, Photography and Memory: Public and Private Lives** Laura Wexler

The role of photographic representation in archives of public and private memory. The social and expressive functions of photography under the aegis of museums, libraries, art galleries, government, police, and personal albums. Critical theory on gender, race, ethnicity, sexuality, class, and nation as they help construct remembering. HU

\* **HSAR 470b / AFAM 291b, Pop Art and Black Culture** Kobena Mercer

Pop art strategies among African American artists who contributed a critique of the modernist canon from the 1950s to present. Critical uses of vernacular materials are studied in view of postmodern theories of art and popular culture. HU

\* **HSAR 484b / EAST 474b, Japanese Screens** Mimi Yiengpruksawan

The screen-painting tradition in Japan, particularly as it emerged in the sixteenth and seventeenth centuries. The format, techniques, and functions of screen painting; poetic and literary connections, as well as studio practices and politics, of the principal lineages of painters; aesthetics and styles associated with varying classes of patronage, from the shoguns to Buddhist monks to the Japanese court. HU

\* **HSAR 490b / FILM 320b, Close Analysis of Film** John Connor

Ways in which traditional genres and alternative film forms establish or subvert convention and expectation and express thematic and ideological concerns. The balancing of narrative containment and excess, as well as action and image. Use of body and voice, space and music. Examples include films by Antonioni, Zhang, Ozu, and Hitchcock. Prerequisite: FILM 150. HU

\* **HSAR 498a or b, Independent Tutorial** Carol Armstrong

For students who wish to pursue a subject in the history of art not otherwise covered by departmental offerings. May be used for research or directed reading under faculty supervision. A term paper or its equivalent and regular meetings with the adviser are required. To apply for admission, a student should present a prospectus and a bibliography, signed by the adviser, to the director of undergraduate studies. Enrollment limited to History of Art majors.

\* **HSAR 499a or b, The Senior Essay** Carol Armstrong

Preparation of a research paper about thirty pages long under the direction of a qualified instructor. The essay is written in either the fall or the spring term of the senior year, though preferably in the fall term. Students write on subjects of their own choice. During the term before the essay is written, students plan the project in consultation with a qualified instructor or with the director of undergraduate studies. No student is permitted to enroll in HSAR 499 without submitting a project statement, with the formal title of the essay and a brief description of the subject to be treated. The statement must be signed by the student's adviser and presented to the director of undergraduate studies before the student's schedule can be approved. The student must submit a suitable project outline and bibliography to the adviser and the director of undergraduate studies early in the term. The outline should indicate the focus and scope of the essay topic, as well as the proposed research methodology; the bibliography should be annotated. Students must also complete a library research colloquium for the senior essay. For essays submitted in the fall term, the deadline for the outline is September 12; for those in the spring term, January 23. Senior essays written in the fall term are due on December 5; those in the spring term on April 20. Two copies must be submitted to the director of undergraduate studies. Failure to comply with any deadline will be penalized by a lower final grade. No late essay will be considered for a prize in the department. Permission may be given to write a two-term essay after consultation with an adviser and the director of undergraduate studies. Only those who have begun to do advanced work in a given area and whose project is considered to be of exceptional promise are eligible. The requirements for the one-term

senior essay apply to the two-term essay, except that the essay should be from fifty to sixty pages in length.

## History of Science, Medicine, and Public Health

Director of undergraduate studies: Naomi Rogers, L 126 SHM, 785-4341,  
naomi.rogers@yale.edu; hshm.yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF HISTORY OF SCIENCE,  
MEDICINE, AND PUBLIC HEALTH

**Professors** Daniel Kevles, William Summers, John Warner

**Associate Professor** Naomi Rogers

**Assistant Professors** Paola Bertucci, Joanna Radin, William Rankin

**Senior Lecturers** Bettyann Kevles, Rebecca Tannenbaum

**Affiliated Faculty** Toby Appel (*Yale University Library*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Jennifer Klein (*History*), Joanne Meyerowitz (*History*), Amy Meyers (*Yale Center for British Art*), Alan Mikhail (*History*), Kevin Repp (*Yale University Library*), Paul Sabin (*History*), Gordon Shepherd (*School of Medicine*), Frank Snowden (*History*), Jenifer Van Vleck (*History*)

History of Science, Medicine, and Public Health is an interdisciplinary program of study that explores the development of science, technology, medicine, and public health and their interactions with each other and with society. Its course offerings range broadly in topics and geographical scope, including the Scientific Revolution, the relationships of medicine and the media in modern America, the development of the physical, earth, and life sciences, the interplay of science, technology, and the state, and public health and epidemics in global perspective. Students in the major combine courses in History of Science, Medicine, and Public Health with courses from other relevant disciplines in the natural sciences, the social sciences, and the humanities.

The program offers students considering a career in medicine, public health, or other health care fields a way to combine the requirements of their professional training with a broad liberal arts education. It also provides excellent preparation for many other careers, including law, business, journalism, museum work, public policy, and government, in which a contextualized understanding of science, technology, and medicine is advantageous.

**Requirements of the major** The major in History of Science, Medicine, and Public Health requires twelve term courses, including the two-term senior requirement. Students select a pathway of seven courses that guides them through an area of specialization. The seven pathway courses must include two courses in History of Science, Medicine, and Public Health; one seminar numbered 100 or above in History of Science, Medicine, and Public Health or in History; one science course; and three electives chosen from relevant courses in any department.

The five standard pathways in the major are medicine and public health; global health; science, technology, and power; gender and sexuality; and arts and media. Students may also design customized pathways in consultation with the director of



undergraduate studies. No later than the beginning of the junior year, students in the major must select a standard pathway or indicate that they wish to design their own.

Beyond the seven pathway courses, students must complete three additional electives in History of Science, Medicine, and Public Health. One of the electives must be a seminar, and one must be chosen from a pathway other than the one selected for the major. All courses for the major are chosen in collaboration with the student's adviser.

**Senior requirement** By the end of reading period in the spring term of the junior year, students choose whether they will work toward a yearlong or a one-term senior project. Yearlong senior projects are completed in HSHM 490, 491; one-term projects are completed in HSHM 492. Students who choose a one-term project must take an additional seminar in History of Science, Medicine, and Public Health during the final term of the senior year. Distinction in the Major is awarded only to students who complete a yearlong senior project.

For both the one-term and yearlong senior projects, students select a project adviser, propose a tentative topic and title, and submit a proposal to the senior project director. The final product of the senior requirement may be a written essay or an alternative project such as a film, exhibition, catalog, atlas, or historical data reconstruction. In the case of an alternative project, the student must identify a second reader in addition to the adviser before the project is approved by the senior project director. Either the adviser or the second reader must be a member of the faculty in History of Science, Medicine, and Public Health. A written component to the senior project must illustrate sources and the intellectual significance of the project. For more details about requirements and deadlines, majors should consult the HSHM Senior Project Handbook; copies are available from the senior project director and on the program's Web site (<http://hshm.yale.edu>).

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 term courses (incl senior req)

**Distribution of courses** 7 courses in pathway, incl 2 HSHM courses, 1 sem in HSHM or Hist, 1 science course, and 3 electives; 3 addtl HSHM electives, incl 1 sem and 1 course outside major pathway

**Senior requirement** Yearlong project (HSHM 490, 491), or one-term project (HSHM 492) and 1 addtl HSHM sem

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## Courses

\* **HSHM 007a / HUMS 076a, Epidemics in Global Perspective** William Summers  
Interaction of epidemic diseases and society. The response of government, medicine, and the public to the threat or actual presence of widespread contagious diseases. The notion of major epidemics as one of the key contingencies of history, critically examined through contemporary medical, political, and literary accounts. The changing responses of societies and governments to epidemics as well as the reasons for those responses.

Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU, SO

**HSHM 202a / AMST 247a / FILM 244a / HIST 147a / HLTH 170a, Media and Medicine in Modern America** John Warner and Gretchen Berland

Relationships between medicine, health, and the media in the United States from 1870 to the present. The changing role of the media in shaping conceptions of the body, creating new diseases, influencing health and health policy, crafting the image of the medical profession, informing expectations of medicine and constructions of citizenship, and the medicalization of American life. HU

**HSHM 204a / AMST 163a / EVST 120a / HIST 120a, Introduction to Environmental History** Paul Sabin

Ways in which people have shaped and been shaped by the changing environments of North America from precolonial times to the present. Migration of species and trade in commodities; contrasting uses of land; the impact of industry and markets; the rise of modern conservation and environmental movements; the development of public policy; the global search for resources by the United States. HU

**HSHM 214a / HIST 402a, Extraterrestrials in History** Ivano Dal Prete

The notion of extraterrestrials and "radical others" in history and culture from antiquity to the present. Topics include other worlds and their inhabitants in ancient Greece; medieval debates on the plurality of worlds; angels, freaks, native Americans, and other "aliens" of the Renaissance; comet dwellers in puritan New England; Mars as a socialist utopia in the early twentieth century; and visitors from space in American popular culture. HU

**HSHM 226b / HIST 236b / HUMS 342b, The Scientific Revolution** Paola Bertucci

The changing relationship between the natural world and the arts from Leonardo to Newton. Topics include the scientific revolution, Renaissance anatomy and astronomy, and alchemy and natural history. HU

**HSHM 235b / HIST 234b, Epidemics and Society in the West since 1600**

Frank Snowden

A study of the impact of epidemic diseases such as bubonic plague, cholera, malaria, and AIDS on society, public health, and the medical profession in comparative and international perspective. Topics include popular culture and mass hysteria, the mortality revolution, urban renewal and rebuilding, sanitation, the germ theory of disease, the emergence of scientific medicine, and debates over the biomedical model of disease. HU

\* **HSHM 410a / HIST 149Ja, History of Pollution** Staff

The science and politics of pollution issues from the late nineteenth century through the end of the twentieth. The rise of antipollution regulations; the emergence of environmental social movements; the role of scientific expertise in national and international policymaking; changes in scientific, political, and public assessments of environmental risks. WR, HU

\* **HSHM 411a / HIST 141Ja, Science from Newton to Neutrons** William Summers

Major themes and ideas in science from the seventeenth century through the twentieth. Focus on evolving descriptions and theories of matter and energy, physics, and

chemistry. The evolution of Newtonian ideas to the world of modern physics and the transition from alchemical thinking to the chemical revolution. WR, HU

\* **HSHM 422b / HIST 140Jb, Cartography, Territory, and Identity** William Rankin  
Exploration of how maps shape assumptions about territory, land, sovereignty, and identity. The relationship between scientific cartography and conquest, the geography of statecraft, religious cartographies, encounters between Western and non-Western cultures, and reactions to cartographic objectivity. Students make their own maps. No previous experience in cartography or graphic design required. WR, HU

\* **HSHM 437b / HIST 435Jb, The Global Crisis of Malaria** Frank Snowden  
The global crisis of malaria examined in comparative and historical context. The mosquito theory of transmission and other developments in scientific understanding of the disease; World Health Organization strategies to eradicate malaria since 1955; the development of tools such as insecticides, medication, and bed nets; the attempt to create an effective vaccine. WR, HU

\* **HSHM 445a / HIST 142Ja / WGSS 453a, Women and Medicine in America from the Colonial Era to the Present** Naomi Rogers  
American women from the colonial era to the present as midwives, patients, healers, reformers, revolutionaries, innovators, and entrepreneurs. Ways that women have shaped American health care and medical research. WR, HU

\* **HSHM 459a / HIST 159Ja / HUMS 359a, Spies, Secrets, and Science**  
Paola Bertucci  
The relationship between secrecy, intellectual property, and science from the Middle Ages to the Cold War. Topics include alchemy and esoteric knowledge; the Manhattan Project and other secret scientific projects run by the state; the history of patents and copyright laws; and scientists as spies. WR, HU

\* **HSHM 466b / HIST 456Jb, The Great Flood and Other Catastrophes**  
Ivano Dal Prete  
The influence on human culture and society of major geological events and of ideas on the history of the Earth. Emphasis on the analysis of objects in the collections of Yale's museums and libraries, including fossils, rare books, and visual representations of natural phenomena. WR, HU

\* **HSHM 468b / HIST 254Jb, Sex, Life, and Generation** Ivano Dal Prete  
Theories and practices of life, sex, and generation in Western civilization. Politics and policies of conception and birth; social control of abortion and infanticide in premodern societies; theories of life and gender; the changing status of the embryo; the lure of artificial life. HU

\* **HSHM 469a / HIST 420Ja, Photography and the Sciences** Staff  
The making of photography's discursive identity as an experimental and evidentiary medium in the sciences, from its announcement to the public in 1839 to the digital innovations of the present. Historical and archival perspectives on uses for photography in different fields of the natural and human sciences. Use of photographic image collections in the Peabody Museum and the Beinecke Library. WR, HU

**\* HSHM 470a and HSHM 471b, Directed Reading** Staff

Readings directed by members of the faculty on topics in the history of science, medicine, or public health not covered by regular course offerings. Subjects depend on the interests of students and faculty. Weekly conferences; required papers.

**\* HSHM 490a and HSHM 491b, Yearlong Senior Project** William Summers

Preparation of a yearlong senior project under the supervision of a member of the faculty. There will be a mandatory meeting at the beginning of the term for students who have chosen the yearlong senior project; students will be notified of the time and location by e-mail before classes begin. Majors planning to begin their projects who do not receive this notice should contact the senior project director. Students expecting to graduate in May enroll in HSHM 490 during the fall term and complete their projects in HSHM 491 in the spring term. December graduates enroll in HSHM 490 in the spring term and complete their projects in HSHM 491 during the following fall term. Majors planning to begin their projects in the spring term should notify the senior project director by the last day of classes in the fall term. Students must meet progress requirements by specific deadlines throughout the first term to receive a temporary grade of SAT for HSHM 490, which will be changed to the grade received by the project upon the project's completion. Failure to meet any requirement may result in the student's being asked to withdraw from HSHM 490. For details about project requirements and deadlines, consult the HSHM Senior Project Handbook. Students enrolled in HSHM 491 must submit a completed project to 211 HGS no later than 5 p.m. on April 6, 2015, in the spring term, or no later than 5 p.m. on December 1, 2014, in the fall term. Projects submitted after 5 p.m. on the due date without an excuse from the student's residential college dean will be subject to grade penalties. Credit for HSHM 490 only on completion of HSHM 491.

**\* HSHM 492a or b, One-Term Senior Project** William Summers

Preparation of a one-term senior project under the supervision of an HSHM faculty member, or of an affiliated faculty member with approval of the director of undergraduate studies. There will be a mandatory meeting at the beginning of the term for students who have chosen the one-term senior project; students will be notified of the time and location by e-mail before classes begin. Majors planning to begin their projects who do not receive this notice should contact the senior project director. Students expecting to graduate in May enroll in HSHM 492 during the fall term. December graduates enroll in HSHM 492 in the preceding spring term. Students planning to begin their project in the spring should notify the senior essay director by the last day of classes in the fall term. Majors must submit a completed Statement of Intention form signed by the faculty member who has agreed to supervise the project to the HSHM administrator in 207 HGS no later than September 12, 2014 (HSHM 492a), or January 12, 2015 (HSHM 492b). Blank statement forms are available in 207 HGS and in the HSHM Senior Project Handbook. Students enrolled in HSHM 492 must submit a completed senior project to 211 HGS no later than 5 p.m. on December 8, 2014, in the fall term, or no later than 5 p.m. on April 27, 2015, in the spring term. Projects submitted after 5 p.m. on the due date without an excuse from the student's residential college dean will be subject to grade penalties.

# Human Rights

Program director: James Silk, L39 SLB, 432-1729, [humanrights.program@yale.edu](mailto:humanrights.program@yale.edu); [humanrights.yale.edu](http://humanrights.yale.edu)

## ADVISORY COMMITTEE FOR THE SPECIAL ACADEMIC PROGRAM IN HUMAN RIGHTS

Seyla Benhabib (*Political Science, Philosophy*), Crystal Feimster (*African American Studies*), Inderpal Grewal (*Women's, Gender, & Sexuality Studies*), Alice Miller (*Law School, Public Health*), Thomas Pogge (*Philosophy*), James Silk (*Law School*), David Simon (*Political Science*), Jay Winter (*History*), Elisabeth Wood (*Political Science*)

The Special Academic Program in Human Rights presents human rights as a rich and interdisciplinary field of study. The program provides students with the analytical, conceptual, and practical skills necessary for human rights study; connects students to affiliate faculty and peers; supports student research projects and internships; and offers career guidance in the field.

Students apply to the the Special Academic Program in Human Rights during the fall term of the sophomore year. They also complete the requirements of a Yale College major. Yale College does not offer a major in human rights.

To fulfill the requirements of the program, students complete a gateway course, four electives, and a capstone project. The gateway course equips students with the theoretical tools necessary for studying human rights, their evolution, and their justification. It introduces a number of contemporary issues such as gender disparities, racial discrimination, climate change, global health, human trafficking, refugees, world poverty, and humanitarian intervention. Students select four electives from a list of eligible courses provided at the start of each term. A capstone project, informed by extracurricular experience, is developed in consultation with the program director.

Additional information is available at the Human Rights Web page (<http://humanrights.yale.edu>).

# Humanities

Director of undergraduate studies: Norma Thompson, Whitney Humanities Center, 53 Wall St., 432-1313, [norma.thompson@yale.edu](mailto:norma.thompson@yale.edu); director: R. Howard Bloch, 53 Wall St., 432-0670, [howard.bloch@yale.edu](mailto:howard.bloch@yale.edu); [www.yale.edu/humanities](http://www.yale.edu/humanities)

## FACULTY ASSOCIATED WITH THE PROGRAM OF HUMANITIES

**Professors** Jeffrey Alexander (*Sociology*), R. Howard Bloch (*French*), Harold Bloom (*Humanities*), Paul Bloom (*Psychology*), Leslie Brisman (*English*), David Bromwich (*English*), Paul Bushkovitch (*History*), Ardis Butterfield (*English*), Rüdiger Campe (*German*), Francesco Casetti (*Humanities*), Wai Chee Dimock (*English*), Carlos Eire (*History, Religious Studies*), Benjamin Foster (*Near Eastern Languages & Civilizations*), Paul Freedman (*History*), Kirk Freudenburg (*Classics*), Bryan Garsten (*Political Science*), David Gelernter (*Computer Science*), Tamar Gendler (*Philosophy, Psychology*), Marie-Hélène Girard (*French*) (*Visiting*), Emily Greenwood (*Classics*), Langdon Hammer (*English*), Karsten Harries (*Philosophy*), Christine Hayes (*Religious Studies, Judaic Studies*), Margaret Homans (*English, Women's, Gender, & Sexuality Studies*), Carol

Jacobs (*German*), Edward Kamens (*East Asian Languages & Literatures*), Alice Kaplan (*French*), Daniel Kevles (*History, History of Medicine*), Tina Lu (*East Asian Languages & Literatures*), John MacKay (*Slavic Languages & Literatures*), Ivan Marcus (*History, Religious Studies*), Millicent Marcus (*Italian*), Stefanie Markovits (*English*), Giuseppe Mazzotta (*Italian*), Alastair Minnis (*English*), Rainer Nägele (*German*), Linda Peterson (*English*), Leon Plantinga (*Emeritus*) (*Music*), Richard Prum (*Ecology & Evolutionary Biology*), Joseph Roach (*English, Theater Studies*), John Rogers (*English*), Andrew Sable (*Ethic, Politics & Economics*) (*Visiting*), Maurice Samuels (*French*), Steven Smith (*Political Science, Philosophy*), William Summers (*History of Medicine*), Henry Sussman (*German*) (*Visiting*), Gary Tomlinson (*Music, Humanities*), Katie Trumpener (*Comparative Literature*), Craig Wright (*Music*), Ruth Yeazell (*English*)

**Associate Professors** Toni Dorfman (*Theater Studies*), Karuna Mantena (*Political Science*), Hindy Najman (*Religious Studies*), Paul North (*German*), Marci Shore (*History*), Kirk Wetters (*German*)

**Assistant Professors** Rebekah Ahrendt (*Music*), Paola Bertucci (*History, History of Medicine*), Joshua Billings (*Humanities*), Marijeta Bozovic (*Slavic Languages & Literatures*), Molly Brunson (*Slavic Languages & Literatures*), Thomas C. Connolly (*French*), Emily Erikson (*Sociology*), David Gabriel (*Comparative Literature*), Bella Grigoryan (*Slavic Languages & Literatures*), Christiana Purdy Mourdarres (*Italian*), Isaac Nakhimovsky (*History*), Shital Pravinchandra (*English*), Ayesha Ramachandran (*Comparative Literature*), Dixa Ramirez (*American Studies*), Yue Zhuo (*French*)

**Senior Lecturers** Charles Hill (*Humanities*), Norma Thompson (*Humanities*)

**Lecturers** Anna Bokov (*Architecture*), Jeffrey Brenzel (*Yale College*), Peter Cole (*Judaic Studies*), Karla Britton (*Divinity School*), Amerigo Fabbri (*Humanities*), Hilary Fink (*Slavic Languages & Literatures*), Karen Foster (*Near Eastern Languages & Civilizations*), Mia Reinoso Genoni (*History of Art*), Joshua Glick (*Film Studies*), Virginia Jewiss (*Humanities*), Edward King (*English*), Stephen Krewson (*English*), Dominika Laster (*Theater Studies*), Adrian Lerner (*History*), Camille Lizarribar (*Humanities*), Judith Malafrente (*Music*), Lukas Moe (*English*), Pamela Schirmeister (*English*), Kathryn Slanski (*Humanities, Near Eastern Languages & Civilizations*), George Syrimis (*Hellenic Studies*), Cecelia Watson (*Philosophy, Humanities*)

The interdisciplinary program in Humanities is designed to contribute to an integrated understanding of the Western cultural tradition. Selected works of European literature, music, philosophy, and visual arts are studied in relation to each other and to the history of ideas and political institutions. The varied program of study offers many options for students in all years interested in interdisciplinary and broad-based work in the humanities, from special seminars for freshmen to the Franke and Shulman Seminars for senior majors. Most courses are open to nonmajors.

The major in Humanities offers three areas of concentration: the arts in the humanities, intellectual history, and the West and its encounters. The major is intended to emphasize breadth and interdisciplinary effort without sacrificing depth. It brings together traditional disciplines in the humanities such as history, literature, history of art, philosophy, and history of music in a manner that is both broadly based and intensively rigorous.

**Prerequisite** There is a prerequisite in ancient civilization, which can be satisfied by Directed Studies or by two courses in classical civilization or in ancient Near Eastern civilization.

**Requirements of the major** In addition to the prerequisite, thirteen term courses are required for the major, including two core seminars in one of the areas of concentration; any five Humanities electives (including Franke and Shulman Seminars), with at least one in each of the three areas of concentration; five additional electives selected to complement the student's area of concentration, with approval of the director of undergraduate studies; and the senior essay, normally written in the spring term of the senior year. Majors in Humanities are strongly encouraged to enroll in at least one term course in literature in a foreign language. Students are expected to declare their intent to major in Humanities in a meeting with the director of undergraduate studies before their junior year.

**Core courses** Two core seminars must be selected from one area of specialization: the arts in the humanities, intellectual history, or the West and its encounters. All seminars listed under these subheads are core seminars.

**The Franke Seminar and the Shulman Seminar** Sponsored by the Whitney Humanities Center and designed to speak across disciplinary lines to broad public and intellectual issues, the Franke Seminar and the Shulman Seminar each include a series of coordinated public lectures. The seminars are for enrolled students; the lecture series are open to the Yale and local communities. Humanities majors may enroll in a Franke or a Shulman Seminar with permission of the director of undergraduate studies and the instructor.

**Summer program in Rome** Humanities majors who take the spring-term course HUMS 444, *The City of Rome*, (or its equivalent, with instructor approval) and develop individual research topics to be pursued in Rome may apply for enrollment in a two-credit summer course offered by Yale Summer Session. Museums, archaeological sites, churches, piazzas, libraries, and the city itself are part of the classroom for the summer course, which addresses key issues relevant to all three areas of concentration in the Humanities major. Further information is available on the Humanities program Web site (<http://www.yale.edu/humanities/summer.html>) and the Yale Summer Session Web site (<http://summer.yale.edu>).

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** Directed Studies, or 2 courses in classical civ or ancient Near Eastern civ

**Number of courses** 13 term courses beyond prereq (incl senior essay)

**Distribution of courses** 2 core sems in 1 area of concentration; 5 Humanities electives, at least 1 in each of 3 areas of concentration; 5 addtl electives

**Senior requirement** Senior essay (HUMS 491)

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### Seminars for Freshmen

\* **HUMS 050b / MUSI 010b, Music and Diplomacy** Rebekah Ahrendt

The history of music in cultural diplomacy, with a focus on theoretical frameworks that grew up around musical practices as a result of music's diplomatic functions. Scores, instruments, and performers mobilized in the service of diplomacy; the influence of

past practices on contemporary policy; state-sponsored musical tours; diplomatic patronage; universal vs. national music, including the use of such labels to further diplomatic goals. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **HUMS 051a / MGRK 002a / RLST 016a, Religion and Literature: Irreverent Texts**  
George Syrimis and Hindy Najman

The complex relationship between religion and literature from the nineteenth century to the present. Focus on the Greco-Roman and Judeo-Christian traditions. Modernity and tradition, the legitimacy of ritual, the relationship between church and state, and the reception of antiquity. The emergence of modern discourses of gender and sexuality in light of religious practice and dogma. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **HUMS 052a / AMST 016a / ENGL 012a, Literary Cities: New York, Chicago, San Francisco** Wai Chee Dimock

An introduction to American literature, told through the vibrant lives, ethnic diversities, and innovative genres revolving around three urban centers. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

\* **HUMS 053a / FILM 092a / GMAN 050a, Spectatorship and Visual Culture**  
Brigitte Peucker

The position of the Western spectator from the eighteenth through the twentieth centuries in a variety of paradigmatic situations. Spectatorship in the contexts of landscape, painting, the city, and film. Looking and the imagination; the relation of the represented to the real; vision and the senses; the nature and politics of looking. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **HUMS 074b / CLCV 008b / LITR 091b / MGRK 001b / RSEE 008b, Western Visions of Greece** George Syrimis

Literary, philosophical, political, and aesthetic categories used by Western cultures since the Enlightenment to construct the concepts "Hellenic" and "ancient Greece." The refiguring of ancient Greek civilization as an ideal cultural template, symbolic origin, and philosophical reflection for both European philhellenes and contemporary Greeks. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **HUMS 076a / HSHM 007a, Epidemics in Global Perspective** William Summers  
Interaction of epidemic diseases and society. The response of government, medicine, and the public to the threat or actual presence of widespread contagious diseases. The notion of major epidemics as one of the key contingencies of history, critically examined through contemporary medical, political, and literary accounts. The changing responses of societies and governments to epidemics as well as the reasons for those responses. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU, SO

\* **HUMS 077a / AMST 017a / ER&M 017a, Travel Literature of the Americas**  
Dixa Ramirez

Evolving visions of the so-called New World from 1492 to the present. Readings from fictional and nonfictional accounts of travel to or throughout the Americas. Visual examples of travel narratives, including tourism ads; some attention to scholarly



criticism. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **HUMS 078a, Shakespeare and Music** Judith Malafrente

The use of music in Shakespeare's plays, from the original stagings and seventeenth-century adaptations to modern productions. Consideration of operatic versions of the plays from the nineteenth, twentieth, and twenty-first centuries. Includes a field trip to New York City. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **HUMS 092b / RLST 012b, Divine Law in Historical Perspective** Christine Hayes

The relationship between the concepts of religion and law in classical Jewish and Christian thought. Law as a religious expression, a concession to human weakness, or a debasement of the divine-human relationship; reasons for obeying religious and secular law; the relation of law and morality; the impact of historical theological debates over the law's spirit vs. its letter on contemporary, secular legal arguments concerning the value of law. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **HUMS 095b / CLCV 002b, The Romans: A Cultural Introduction**

Kirk Freudenburg

An introduction to ancient Roman culture, with special focus on the lives of common citizens, non-elites, foreigners, freedmen, and slaves. Topics include family life, the ideology of empire, religious life, spectacles of power, dining, entertainments, bathing, travel, satire, and the law. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

## The Arts in the Humanities

\* **HUMS 159a / ENGL 157a / FREN 305a, Medieval Biography** Ardis Butterfield

The sources, aims, and diversity of biographical forms in medieval literature. Analysis of the medieval world through the study of autobiography, hagiography, political martyrology, and literary biography; the challenges of viewing a historical period primarily through a single life. Includes a research trip to New York City. Recommended preparation: reading knowledge of French. HU

**HUMS 160b / ENGL 171b / LITR 177b, Chaucer and Medieval London**

Ardis Butterfield

Chaucer's writings explored through the human and physical landscape of medieval London and Westminster. The crowds, sounds, and visual stimuli of the city examined alongside literary genres in which the author wrote, including dream visions, love epic, lyrics, and comic, satiric, and religious narrative. Chaucer's sense of the writer's craft as a means of imagining space and sound and of depicting the emotional resonance of urban street scenes. HU

**HUMS 161a / ENGL 185a / FILM 356a, Medieval Literature in Movies**

Alastair Minnis

A study of medieval narrative traditions and their appropriation in modern film. *Beowulf*, selections from Chaucer's *Canterbury Tales*, and Malory's *Morte D'Arthur* are compared with modern film and television adaptations. HU

\* **HUMS 162b / FREN 388b, Feminine Voices in French Literature** R. Howard Bloch  
An exploration of women's voices in French literature from the Middle Ages to the mid-twentieth century. The specificity of the feminine voice, the plurality of feminine voices, love and sexuality, and social and professional identity. Authors include Marie de France, Marguerite de Navarre, George Sand, Maryse Condé, and Marguerite Duras. Readings and discussion in English. WR, HU

\* **HUMS 165a / ENGL 395a / LITR 154a, The Bible as Literature** Leslie Brisman  
Study of the Bible as a literature—a collection of works exhibiting a variety of attitudes toward the conflicting claims of tradition and originality, historicity and literariness. Pre-1800 with completion of supplementary assignments in the language of the King James Bible. If there is sufficient interest, a second section will be offered. WR, HU RP

\* **HUMS 166a / ENGL 248a / EVST 325a, Nature Writing in Britain and the English-Speaking World** Linda Peterson  
Natural history and environmental writing in the English-speaking world from the late eighteenth century to the present. Readings include Gilbert White's *Natural History of Selborne*, Thoreau's *Walden*, and Darwin's *Voyage of the Beagle*, as well as recent work by writers from Canada, the United States, India, and South Africa. Pre-1900 with permission of instructor. WR, HU

\* **HUMS 167a / FREN 366a / HSAR 251a, Writers and Artists in Paris, 1780–1914**  
Marie-Hélène Girard  
Ways in which the transformation of Paris shaped the representation of artists who lived and worked in the French capital from the end of the Old Regime until the eve of World War I. The emergence of Paris as a cultural marker; the role played by the image of the bohemian or the *artiste maudit*. Authors and artists include David, Balzac, Delacroix, Baudelaire, Manet, Mallarmé, impressionist painters, and Picasso. L5, HU

\* **HUMS 169a / ENGL 390a / THST 411a, Art and the Stage in Britain** Joseph Roach  
The intersection of the fine and performing arts in London and in the British provinces and colonies, from the stage designs of Inigo Jones in the seventeenth century to those of David Hockney in the twentieth and twenty-first. Survey of major styles in stage design, theatrical portraiture, theater architecture, and ephemera. Extensive use of collections in the Yale Center for British Art. WR, HU

\* **HUMS 170a / ENGL 303a, Consciousness in the Novel from Austen to Woolf**  
Ruth Yeazell  
Close study of selected novels by Jane Austen, George Eliot, Henry James, and Virginia Woolf, with particular attention to the representation of consciousness and the development of free indirect discourse, as well as recent speculations about so-called theory of mind. Readings supplemented by narrative theory. Pre-1900 with permission of instructor. WR, HU

**HUMS 171b / ENGL 213b, Style, Purpose, and Persuasion in Literature**  
David Bromwich

The uses of rhetoric, persuasion, and the making of infectious moods and emotions in literature, political writing, and social criticism. Topics include incitement, description with intent, and epigram and aphorism. Examples are drawn from Shakespeare, Milton, Emerson, Burke, Lincoln, Churchill, Auden, Kipling, Gershwin, and others.

HU

**\* HUMS 198a / ENGL 129a / LITR 168a, Tragedy in the European Literary Tradition**  
Staff

The genre of tragedy from its origins in ancient Greece and Rome through the European Renaissance to the present day. Themes of justice, religion, free will, family, gender, race, and dramaturgy. Works include Homer's *Iliad* and plays by Aeschylus, Sophocles, Euripides, Seneca, Shakespeare, Racine, Ibsen, Chekhov, Brecht, Beckett, and Soyinka. Focus on textual analysis and on developing the craft of persuasive argument through writing. WR, HU

**\* HUMS 199a or b / ENGL 130a or b / LITR 169a or b, Epic in the European Literary Tradition** Staff

The epic tradition traced from its foundations in ancient Greece and Rome to the modern novel. The creation of cultural values and identities; exile and homecoming; the heroic in times of war and of peace; the role of the individual within society; memory and history; politics of gender, race, and religion. Works include Homer's *Odyssey*, Vergil's *Aeneid*, Dante's *Inferno*, Cervantes's *Don Quixote*, and Joyce's *Ulysses*. Focus on textual analysis and on developing the craft of persuasive argument through writing. WR, HU

**HUMS 201b / FREN 240b / LITR 214b, The Modern French Novel**

Alice Kaplan and Maurice Samuels

A survey of major French novels, considering style and story, literary and intellectual movements, and historical contexts. Writers include Balzac, Flaubert, Proust, Camus, and Sartre. Readings in translation. One section conducted in French. HU TR

**HUMS 204b / LITR 301b / RUSS 380b, Putin's Russia and Protest Culture**

Marijeta Bozovic

Survey of Russian literature and culture since the fall of communism. The chaos of the 1990s; the solidification of power in Putin's Russia; the recent rise of protest culture. Sources include literature, film, and performances by art collectives. Readings and discussion in English; texts available in Russian. WR, HU TR

**\* HUMS 205a, Boundaries of the Body in Law and Literature** Camille Lizarrábar

The representation of the human body in law and literature. Bodies as physical structures that inhabit multiple realms, including material, cultural, historical, and symbolic. Ways in which humans think about and give meaning to their bodies in relationship to themselves and to others. Additional sources include film, television, and journalism. WR, HU

**HUMS 209a / FILM 314a, Media Archeology** Francesco Casetti and Mallory Ahern

An archaeological approach to the history of media, with a focus on the prehistory of now-ubiquitous technologies. Contrasting elements at play in the making of new media, including economics, science, and social needs; what inventors and innovators deemed possible at various points in history; social factors that cause new media technology to succeed or fail, and ways in which media in turn shape society. HU

**\* HUMS 210b / ITAL 317b / LITR 180b / RLST 335b / WGSS 317b, Women in the Middle Ages** Christiana Purdy Moudarres

Medieval understandings of womanhood examined through analysis of writings by and/or about women, from antiquity through the Middle Ages. Introduction to the premodern Western canon and assessment of the role that women played in its construction. TR

\* **HUMS 212a / LITR 205a / RUSS 321a, Capitalism and the Nineteenth-Century European Novel** Bella Grigoryan

The cultural significance and literary representations of capitalism in nineteenth-century Europe. Labor and leisure; material culture and consumerism; social and geographic mobility; constitution of the modern self; the public sphere; private life; economics and literary form. Works by Balzac, Gogol, Dickens, Dostoevsky, and Zola supplemented by selections from theoretical writings. Readings and discussion in English. WR, HU TR

\* **HUMS 215a / MUSI 243a, Opera** Gary Tomlinson

A survey of the history of opera from its beginnings in late sixteenth-century Italy to the twentieth century. Selected works examined against the background of changing poetic, musical, aesthetic, and social conventions. Issues of singing, staging, filming, and reviewing this multimedia art form. Counts toward the Music major as a Level III course with permission of instructor. HU

**HUMS 217b / MUSI 107b, Exploring the Nature of Genius** Craig Wright

The changing meanings of the term "genius" in Western culture; discussion as to whether genius is a reality. Focus on the special talents needed to respond to and shape the world in a defining fashion, and the quirky patterns of thought exemplified by great minds, principally Leonardo da Vinci, Newton, Mozart, Woolf, Beethoven, van Gogh, Picasso, and Joyce. Recent developments in neurobiology that suggest future lines of research into the minds of exceptional individuals. WR, HU

**HUMS 220b / HSAR 221b / RUSS 220b, Russian and Soviet Art, 1757 to the Present**

Molly Brunson

The history of Russian and Soviet art from the foundation of the Academy of the Arts in 1757 to the present. Nineteenth-century academicism, romanticism, and realism; the Russian avant-garde and early Soviet experimentation; socialist realism and late- and post-Soviet culture. Readings and discussion in English. HU TR

\* **HUMS 227b / GMAN 247b / LITR 201b, Goethe's Wilhelm Meister** Kirk Wetters

A detailed study of Goethe's two Wilhelm Meister novels. *Wilhelm Meister's Apprenticeship* as the first novel of the nineteenth century and the prototypical novel of education (Bildungsroman); *Wilhelm Meister's Journeyman Years* as an unconventional sequel in which Goethe shows his unwillingness to repeat the model of his earlier breakthrough work. Readings and discussion in English. HU

**HUMS 228a / LITR 202a / RUSS 260a, Nabokov and World Literature**

Marijeta Bozovic

Vladimir Nabokov's writings explored in the context of his life story and of the structures and institutions of literary life in Russian émigré circles. Themes of exile, memory, and nostalgia; hybrid cultural identities and cosmopolitan elites; language and bilingualism; the aims and aesthetics of émigré and diasporic modernism in novels and other media. Additional readings from works of world literature inspired and influenced by Nabokov. Readings and discussion in English. WR, HU

\* **HUMS 231b / MUSI 435b, Music in European Thought: Three Moments in the Modern Era** Leon Plantinga

An inquiry into the role of music and thought about music at three critical junctures in the intellectual and cultural history of modern Europe: the birth of modernity

and opera; the Enlightenment and the classical style; and German romanticism and Beethoven. HU

**HUMS 235b / HSAR 291b, Buildings and Power in Italy** Mia Reinoso Genoni  
Investigation of how architecture and monumental sculpture are expressions of power in Italy, c. 1220–1660. Focus on works built by civil and religious authorities. Ways in which buildings create or solidify power; strategies available to rulers and authorities; relations between patron and architect; demonstrations of changes in power through the use of both traditional and innovative architectural idioms; contemporary interpretations, understandings, and rejections of monumental statements of power.  
HU

\* **HUMS 243a / LITR 227a / RUSS 333a, The Living Dead in Literature**

Molly Brunson

A study of ghosts, vampires, cyborgs, animated artworks, and other supernatural beings in Slavic, western European, and American literature and culture. The thematic, historical, and epistemological significance of violating the border between life and death in art. Analysis of novels, short stories, folklore, visual arts, and theoretical texts. Readings and discussion in English. HU

\* **HUMS 250b / FREN 342b / LITR 235b, French Literary Movements from Romanticism to Decadence** Yue Zhuo

A study of key texts, ideas, and events that shaped literary history in the nineteenth and early twentieth centuries, from romanticism, realism, and naturalism to Symbolism and Decadence. Literary works by Chateaubriand, Mme de Staël, Constant, Mérimée, Balzac, Baudelaire, Zola, Rimbaud, Mallarmé, Maupassant, Huysmans, and Proust.

HU TR

**HUMS 252b / ARCG 239b / HSAR 239b / NELC 104b, Art of the Ancient Near East and Aegean** Karen Foster

Introduction to the art and architecture of Mesopotamia, Egypt, and the Aegean, with attention to cultural and historical contexts. HU

\* **HUMS 262a / GMAN 268a / LITR 457a, W. G. Sebald** Carol Jacobs

Close readings of the major works of W. G. Sebald along with texts of other authors who played a direct role in these writings, including Thomas Browne, Grimmshausen, Kafka, and Heschel. Texts in relation to theory of literature in terms of memory, representation, identity, ethical imperatives, and intertextual and intermedia relations. HU

\* **HUMS 270b / HSAR 310b, Futurism: The Shock of the New** Amerigo Fabbri  
Cultural and intellectual shifts in literature, philosophy, and the arts at the end of the nineteenth century, marking the rise of modernism. Futurism, surrealism, and other avant-garde movements that transformed into art the dramatic challenges of a new technological and psychological reality. HU

\* **HUMS 273a / HSAR 434a, Michelangelo** Joost Keizer

Central problems of current research on Italian Renaissance art approached both through the works of Michelangelo, the Renaissance artist who reflected most profoundly on the nature of art, and through their historiography. Includes a daylong excursion to New York City to view works by Michelangelo. HU

\* **HUMS 276a / RUSS 250a, Masterpieces of Russian Literature I** Molly Brunson  
Introduction to major texts of the nineteenth-century Russian literary tradition. Works by Pushkin, Gogol, Lermontov, Turgenev, Dostoevsky, Tolstoy, and Chekhov examined in their social and historical contexts. Emphasis on the authors' use of genre, language, and literary devices to explore pressing questions posed by Russian modernity. Readings and discussion in English. HU TR

\* **HUMS 277b / LITR 328b / MGRK 212b, Folktales and Fairy Tales**  
Maria Kaliambou

History of the folktale from the late seventeenth through the late twentieth centuries. Basic concepts, terminology, and interpretations of folktales, with some attention to twentieth-century theoretical approaches. Performance and audience, storytellers, and gender-related distinctions. Interconnections between oral and written traditions in narratives from western Europe and Greece. HU TR

**HUMS 285b / HIST 237b / RSEE 390b / RUSS 241b, Russian Culture: The Modern Age** Paul Bushkovitch and John MacKay

An interdisciplinary exploration of Russian cultural history, focusing on literature, art, religion, social and political thought, and film. Conceptions of Russian nationhood; the myths of St. Petersburg; dissent and persecution; the role of social and cultural elites; the intelligentsia; attitudes toward the common people; conflicting appeals of rationality, spirituality, and idealism; the politicization of personal life; the impact of the Bolshevik Revolution and its aftermath. HU

\* **HUMS 287b / GMAN 327b, Around Kafka** Henry Sussman

Franz Kafka's writings viewed as a site for the radical questioning and dislocation of Western systems, institutions, and mores of the early twentieth century. Attention to the shorter fiction, the novels, the letters, and their strategic interrelations; examination of the fields of knowledge, ideological presumptions, and aesthetic and cultural experiments that Kafka touched, and to some degree deranged, with his writing. HU TR

**HUMS 289a / DEVN 196a / E&EB 190a, The Evolution of Beauty** Richard Prum  
Aesthetics and beauty explored from the perspectives of evolutionary biology, zoology, human biology, arts, and culture. Survey of the mechanisms and processes of aesthetic evolution in animals and plants; the nature of sexual conflict over reproduction; the role of aesthetic preferences in the evolution of sexual autonomy; human aesthetics and human art. HU

\* **HUMS 295a / ENGL 353a / LITR 463a, Medieval Celtic Literature** David Gabriel  
Major texts of Celtic literature, focusing on works from the birth of vernacular literature in the Middle Ages to the early modern period. Cultural, historical, and literary issues surrounding works in the Irish and Welsh languages; literary culture in Breton, Cornish, Scottish Gaelic, and Manx. Genres include lyric and bardic poetry, heroic and religious narrative, and early Arthurian works. Readings in English translation; no knowledge of Celtic languages assumed. HU TR

## Intellectual History

\* **HUMS 300b, Oratory in Statecraft** Charles Hill

A seminar and practicum in oratory, the first tool of leadership. A study of oratory as it provides direction, builds support, and drives action on a strategic agenda. Analysis of

speeches in antiquity, the early modern era, and the unique American voice: Edwards to Lincoln to King. HU

**HUMS 302a / PLSC 290a / SOCY 151a, Foundations of Modern Social Theory**

Emily Erikson

Major works of social thought from the beginning of the modern era through the 1920s. Attention to social and intellectual contexts, conceptual frameworks and methods, and contributions to contemporary social analysis. Writers include Hobbes, Locke, Rousseau, Kant, Adam Smith, Marx, Freud, Peirce, Weber, and Durkheim. SO

**\* HUMS 303a, Metahistories** Charles Hill

Introduction to metahistory, a method that extracts meaning from the entire sweep of human experience, organizes masses of fact into a coherent system, and analyzes patterns and tendencies. The complex interplay of facts and ideas that underlies metahistory. Different conceptions about the course of human events; the impact of such ideas on the nations they affect. HU TR

**\* HUMS 304b, The Grid: Knowledge, Histories, Visualization**

Anna Bokov, Stephen Krewson, and Staff

The notion of the grid explored from a range of historical and disciplinary perspectives. The grid as a formal device and a graphic representational tool in fields such as architectural and urban design, typography, Web design, and computer-aided design. Use of the grid as a conceptual framework in computer science and mathematics, including its relation to big data. Case studies involving the grid as a physical phenomenon and its interactions with complex environmental, cultural, and political realities. WR, HU RP

**\* HUMS 307a, Readings in the History of Western Science** Cecelia Watson

Humanistic and social-scientific perspectives on scientific texts in the Western tradition from the first century through the twentieth. Readings from work in the natural sciences and medicine span every major disciplinary category of scientific thought. HU

**\* HUMS 311a / GMAN 211a / PHIL 412a, Marx, Nietzsche, Freud** Rüdiger Campe

The revolutionary ways in which Marx, Nietzsche, and Freud redefined the ends of freedom. Key works of the three authors on agency in politics, economics, epistemology, social life, and sexuality. Agency as individual or collective, as autonomous or heteronomous, and as a case of liberation or subversion. Additional readings from Kant, Hegel, Kierkegaard, and Weber. HU

**\* HUMS 315a, The Making of Character** Norma Thompson

Human nature and its plasticity explored through literature and philosophy. The level of rational control humans can exert over their own character formation; the extent to which character depends on upbringing and education; possibilities for improvement or radical change; the relation of individual and national character formations. HU

**HUMS 319b / PLSC 294b, Modern Political Philosophy** Karuna Mantena

Fundamental political questions about freedom, authority, modernity, and the nature of politics as they are treated in Western political thought from the sixteenth century to the twentieth. Competing interpretations by Machiavelli, Hobbes, Spinoza, Locke, Rousseau, Publius, Tocqueville, and others. SO

\* **HUMS 322b / GMAN 210b, The Frankfurt School** Kirk Wetters

Major works of the Frankfurt school of social research explored in the context of twentieth-century social, psychological, political, literary, and aesthetic thought. HU

\* **HUMS 331b / HIST 235Jb, Existentialism and Dissent** Marci Shore

Intellectual history of twentieth-century Europe, focusing on existentialist philosophy and its confrontation with Marxism in theory and with communist regimes in practice.

WR, HU

**HUMS 342b / HIST 236b / HSHM 226b, The Scientific Revolution** Paola Bertucci

The changing relationship between the natural world and the arts from Leonardo to Newton. Topics include the scientific revolution, Renaissance anatomy and astronomy, and alchemy and natural history. HU

**HUMS 348a / HIST 280a / RLST 160a, The Catholic Intellectual Tradition**

Carlos Eire

Introductory survey of the interaction between Catholicism and Western culture from the first century to the present, with a focus on pivotal moments and crucial developments that defined both traditions. Key beliefs, rites, and customs of the Roman Catholic Church, and the ways in which they have found expression; interaction between Catholics and the institution of the Church; Catholicism in its cultural and sociopolitical matrices. Close reading of primary sources. HU

**HUMS 349a / JDST 110a / RLST 145a, The Bible** Christine Hayes

The writings common to both Jewish and Christian scripture examined as diverse and often conflicting expressions of the religious life and thought of ancient Israel. The works' cultural and historical setting in the ancient Near East; the interpretive history of selected passages influential in Western culture. Introduction to a wide range of critical and literary approaches to biblical studies. Students view course lectures, which survey the entire Bible, on line; class time focuses on specific biblical passages and their subsequent interpretation in Jewish and Christian culture. HU

\* **HUMS 355a / PLSC 295a, The Idea of Statesmanship** Steven Smith

The idea of the statesman and the role of statecraft in founding and preserving political institutions. Statesmanship as a form of art guided by rational deliberation and decision making; the roles of historical circumstances, economic interests, and cultural values. Readings include theoretical works from Machiavelli to Isaiah Berlin and political works from the Federalist Papers to Winston Churchill. HU, SO

\* **HUMS 359a / HIST 159Ja / HSHM 459a, Spies, Secrets, and Science**

Paola Bertucci

The relationship between secrecy, intellectual property, and science from the Middle Ages to the Cold War. Topics include alchemy and esoteric knowledge; the Manhattan Project and other secret scientific projects run by the state; the history of patents and copyright laws; and scientists as spies. WR, HU

\* **HUMS 407a / CPSC 150a, Computer Science and the Modern Intellectual Agenda**

David Gelernter

Introduction to the basic ideas of computer science (computability, algorithm, virtual machine, symbol processing system), and of several ongoing relationships between computer science and other fields, particularly philosophy of mind. No previous experience with computers necessary. Enrollment limited to 25. WR, HU



\* **HUMS 408b / CPSC 151b, The Graphical User Interface** David Gelernter

The role of graphical user interfaces (GUIs) on standard platforms such as desktop PCs, laptops, and small-screen devices. Discussion of how and why GUIs developed as they did, why they have evolved so little since the desktop computers of the 1970s, and how changing hardware and user requirements might reshape them in the future. Enrollment limited to 25. WR

## The West and Its Encounters

\* **HUMS 411b, Life Worth Living** Matthew Croasmun

Comparative exploration of the shape of the life advocated by several of the world's normative traditions, both religious and nonreligious. Concrete instantiations of these traditions explored through contemporary exemplars drawn from outside the professional religious or philosophical spheres. Readings from the founding texts of Buddhism, Judaism, Christianity, Islam, Marxism, and utilitarianism. HU

\* **HUMS 427b / ENGL 456b / JDST 316b / LITR 348b, The Practice of Literary Translation** Peter Cole

Intensive readings in the history and theory of translation paired with practice in translating. Case studies from ancient languages (the Bible, Greek and Latin classics), medieval languages (classical Arabic literature), and modern languages (poetic texts). HU

\* **HUMS 428a / ENGL 243a / LITR 207a / MGRK 214a / WGSS 215a, Modern Literature and the Eastern Mediterranean** George Syrimis

The formative influences of Sappho and C. P. Cavafy on the Anglo-American literary tradition from the twentieth century to the present. Nationalism and imperialism, sexuality and aesthetics, biography and art, sapphic verse, the reception of the classical tradition, and the topography of modernity. Writers' fascination with the eastern Mediterranean as an alternative locus for modern Greek, English, and American identities. HU

**HUMS 432a / EALL 200a, The Chinese Tradition** Tina Lu

An introduction to the literature, culture, and thought of premodern China, from the beginnings of the written record to the turn of the twentieth century. Close study of textual and visual primary sources, with attention to their historical and cultural backdrops. No knowledge of Chinese required. HU

\* **HUMS 434b / CLCV 113b / NELC 230b, Mesopotamia's Literary Legacy**  
Kathryn Slanski

Major works of ancient Near Eastern literature; relationships with literary traditions in the Hebrew Bible and ancient Greece. Readings include myths, epics, wisdom literature, love poetry, and humorous stories. HU

\* **HUMS 435a / EALL 236a / LITR 181a, Japanese Poetry and Poetics**  
Edward Kamens

Core concepts and traditions of classical Japanese poetry explored through the medium of translation. Readings from anthologies and treatises of the ninth through early twentieth centuries. Attention to recent critical studies in transcultural poetic theory. Inspection and discussion of related artifacts in the Beinecke Rare Book and Manuscript Library and the Yale University Art Gallery. Readings and discussion in English. HU

\* **HUMS 438a / NELC 101a, Origins of Western Civilization: The Near East from Alexander to Muhammad** Benjamin Foster

Cultural and historical survey of Hellenistic, eastern Roman, Parthian, Byzantine, and Sassanian empires in the Near East. Emphasis on mutual influences of Near Eastern and classical worlds, the rise of Christianity and Islam in Near Eastern contexts, and the division of East and West between conflicting ideas of unity. HU

**HUMS 441a / NELC 121a, The Hero in the Ancient Near East** Kathryn Slanski

Exploration of the interaction of religion, history, and literature in the ancient Near East through study of its heroes, including comparison with heroes, heroic narratives, and hero cults in the Bible and from classical Greece. WR, HU

\* **HUMS 443a / HIST 232Ja / JDST 270a / MMES 342a / RLST 201a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

\* **HUMS 444b, The City of Rome** Virginia Jewiss

An interdisciplinary study of Rome from its legendary origins through its evolving presence at the crossroads of Europe and the world. Exploration of the city's rich interweaving of history, theology, literature, philosophy, and the arts in significant moments of Roman and world history. HU

\* **HUMS 447a or b, Sacred Architecture and the Contemporary City** Karla Britton

Study of sacred architecture in urban contexts from World War II to the present. Ways in which the sacred has been given expression in material form in complex urban societies. The religious building as a representation of cultural heritage, challenges of faith, and civic space in a pluralistic world. Case studies from the United States, the Middle East, Japan, Europe, and Latin America.

**HUMS 457b / EVST 189b / HIST 246b, The History of Food** Paul Freedman

The history of food and culinary styles from prehistory to the present, with a particular focus on Europe and the United States. How societies gathered and prepared food. Changing taste preferences over time. The influence of consumers on trade, colonization, and cultural exchange. The impact of colonialism, technology, and globalization. The current food scene and its implications for health, the environment, and cultural shifts. HU

## The Franke Seminar

\* **HUMS 453a / ENGL 414a, Utopia** John Rogers

An examination of utopian fiction. Focus on works from early modern England, with some attention to more recent utopian writings. The genre's Platonic origins, its ties to early modern political philosophy, its role in the rise of the novel, and its legacy in science fiction. Utopian literature's abiding concern with issues of social discipline, religion, education, science, marriage, and sex. WR, HU

## The Shulman Seminar

\* **HUMS 458b, Habits of Mind** Paul Bloom and Tamar Gendler

The nature of habits of mind—the instinctive or learned, and often unconscious, processes that underlie human thought and automatic behaviors. How habits are acquired and how they can be reshaped, their relation to deliberate decisions, and their role in domains as diverse as infant development, procrastination, racial stereotyping, and the enjoyment of fiction. Research and theory from fields in the sciences, social sciences, and humanities. Prerequisites: one course in psychology and one in philosophy, or with permission of instructor.

## Individual Research and Senior Essay Courses

\* **HUMS 470a and HUMS 471b, Special Studies in the Humanities**

Norma Thompson

For students who wish to pursue a topic in Humanities not otherwise covered. May be used for research or for directed reading under the guidance of one or more faculty advisers. In either case a term paper or its equivalent is required, as are regular meetings with the adviser or advisers. To apply, a student should present a prospectus and a bibliography signed by the adviser or advisers to the director of undergraduate studies. Enrollment limited to juniors and seniors majoring in Humanities.

\* **HUMS 491a or b, The Senior Essay** Norma Thompson

Independent library-based research under faculty supervision. To register, students must consult the director of undergraduate studies no later than the end of registration period in the previous term. A written plan of study approved by a faculty adviser must be submitted to the director of undergraduate studies by November 14, 2014, if the essay is to be submitted during the spring term, by April 24, 2015, for yearlong or fall-term essays. A rough draft of the essay is due at noon on March 23, 2015, for spring-term essays or on October 31, 2014, for fall-term essays. The final essay is due at noon on April 10, 2015, for spring-term essays or on December 5, 2014, for fall-term essays; late essays will be penalized by a lower grade. RP

## Italian

Director of undergraduate studies: Christiana Purdy Moudarres, 82–90 Wall St., 432-0596, christiana.purdymoudarres@yale.edu; language program director: Anna Iacovella, 82–90 Wall St., 432-8299, anna.iacovella@yale.edu; italian.yale.edu

FACULTY OF THE DEPARTMENT OF ITALIAN

**Professors** Millicent Marcus, Giuseppe Mazzotta (*Chair*)

**Associate Professor** Angela Capodivacca

**Assistant Professor** Christiana Purdy Moudarres

**Senior Lectors** Michael Farina, Monica Georgeo, Anna Iacovella

**Affiliated Faculty** Francesco Casetti (*Film Studies*), Joost Keizer (*History of Art*), Gundula Kreuzer (*Music*), Alastair Minnis (*English*), Frank Snowden (*History*), Gary Tomlinson (*Music, Humanities*), Francesca Trivellato (*History*), Chris Wood (*History of Art*)

The major in Italian explores Italy's vital role in the formation of Western thought and culture. The core language courses bring students to a high level of aural, spoken, and written proficiency, provide a solid literary and historical background in the language, and prepare students for study in Italy. Other offerings build on the core courses to explore Italian literature, film, history, culture, and art. The Italian major is of particular relevance to the fields of art, economics, film studies, history, history of art, international relations, linguistics, literature, philosophy, and theology.

**Prerequisite** Candidates for the major should have completed a course in Italian at the level of 130 (L3) or should have received credit for equivalent work by the end of their sophomore year. Exceptions may be made in the case of outstanding students who have not satisfied this requirement.

**Requirements of the major** The major normally consists of eleven term courses beyond the prerequisite. Eight term courses in the Italian department numbered 140 or above (including graduate courses) are required, at least five of which must be conducted in Italian. The courses in the department must include either ITAL 150 or 151 and a course on Dante's *Divine Comedy* (ITAL 310 or equivalent), as well as four courses covering different periods in Italian literature: one in the Middle Ages (in addition to the course on Dante's *Divine Comedy*), one in the Renaissance, and two in Italian literature after 1600. The aim of these six foundation courses is to provide students with both a broad acquaintance with the major works of Italy's literary tradition and a more detailed knowledge of specific periods in Italian literature. Students are also strongly encouraged to use their elective courses to expand their knowledge of either the *Trecento* (fourteenth century) or the *Cinquecento* (sixteenth century). No more than three Italian department courses taught in English may count toward the major. Students intending to major in Italian should consult the director of undergraduate studies.

In completing their programs, students are required to elect two courses in other languages and literatures, history of art, history, or philosophy that are related to their field of study and approved by the director of undergraduate studies. Any graduate course in another national literature or in linguistics may be substituted for one of these two courses. Some knowledge of Latin is desirable.

**Senior requirement** In the fall or spring of the senior year, all students majoring in Italian must present a departmental essay written in Italian and completed under the direction of a faculty adviser in ITAL 491. The essay should demonstrate careful reading and research on a topic approved by the adviser in consultation with the director of undergraduate studies. A recommended length for the essay is thirty pages. Prospectus and draft deadlines are determined by the adviser; the final deadline is determined by the director of undergraduate studies. The senior requirement culminates in a meeting with department faculty to discuss the thesis and the student's overall experience of study in the major.

**Related majors** In addition to the major in Italian literature, the department supports the applications of qualified students who wish to pursue a course in Italian studies under the provisions of a Special Divisional Major. Majors can devise a broad program in social, political, economic, or intellectual history as related to and reflected in Italian literature, or pursue special interests in architecture, film, art, philosophy, music, history, linguistics, theater, political theory, or other fields especially well suited for

examination from the perspective of Italian cultural history. Majors in Italian studies must design their programs in close consultation with the director of undergraduate studies and seek the guidance of an additional member of the department whose interests closely coincide with the proposed program of study. For further information, see under Special Divisional Majors (p. 653).

The department's course offerings vary greatly from year to year. Students interested in planning course work in Italian that extends beyond the current academic year should consult the director of undergraduate studies.

For information about the Year or Term Abroad program, see under Special Arrangements (p. 63) in the Academic Regulations.

**Placement** All students who have not taken Italian at Yale are expected to take the departmental placement test, with the exception of students who have no previous knowledge of Italian. The departmental placement examination will be given at the beginning of the fall term; see the *Calendar for the Opening Days of College* and the departmental Web site (<http://italian.yale.edu/placement-test>) for details.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** ITAL 130 or equivalent

**Number of courses** 11 term courses beyond prereq (incl senior req)

**Specific courses required** ITAL 150 or 151; ITAL 310 or equivalent

**Distribution of courses** 8 term courses in Italian dept numbered 140 or above, incl 1 in Middle Ages (in addition to ITAL 310), 1 in Renaissance, and 2 in Italian lit after 1600, at least 5 of these conducted in Italian; 2 courses in other langs or lits, hist of art, hist, or phil approved by DUS

**Substitution permitted** Any grad course in another national lit or in ling for 1 of the 2 courses in other depts, with DUS permission

**Senior requirement** Senior essay (ITAL 491) and oral interview

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## Group A Courses

\* **ITAL 110a, Elementary Italian I** Staff

A beginning course with extensive practice in speaking, reading, writing, and listening and a thorough introduction to Italian grammar. Activities include group and pairs work, role-playing, and conversation. Introduction to Italian culture through readings and films. Conducted in Italian. Credit only on completion of ITAL 120. L1  
1½ Course cr

\* **ITAL 120a or b, Elementary Italian II** Staff

Continuation of ITAL 110. L2 1½ Course cr

\* **ITAL 125a or b, Intensive Elementary Italian** Michael Farina

An accelerated beginning course in Italian that covers in one term the material taught in ITAL 110 and 120. Admits to ITAL 130 or 145. Enrollment limited to 15. L1, L2  
2 Course cr

\* **ITAL 130a, Intermediate Italian I** Staff

The first half of a two-term sequence designed to increase students' proficiency in the four language skills and advanced grammar concepts. Authentic readings paired with

contemporary films. In-class group and pairs activities, role-playing, and conversation. Admits to ITAL 140. Conducted in Italian. Prerequisite: ITAL 120 or equivalent. L3  
1½ Course cr

\* **ITAL 140b, Intermediate Italian II** Staff

Continuation of ITAL 130. Emphasis on advanced discussion of Italian culture through authentic readings (short stories, poetry, and comic theater) and contemporary films. Admits to Group B courses. Conducted in Italian. L4

\* **ITAL 145a or b, Intensive Intermediate Italian** Staff

An accelerated intermediate course in Italian that covers in one term the material taught in ITAL 130 and 140. Continued practice in the four basic skills begun at the elementary level. Emphasis on grammar review, vocabulary enrichment, and appreciation of literary texts. Admits to Group B courses. Enrollment limited to 15. Prerequisite: ITAL 120 or 125. L3, L4 2 Course cr

## Group B Courses

Group B courses have readings in Italian and are usually conducted in Italian. They are open to students who have passed ITAL 140 or 145 and to others with the consent of the director of undergraduate studies and the instructor.

**ITAL 150a, Advanced Composition and Conversation** Anna Iacovella

Discussion of social, political, and literary issues in order to improve active command of the language. Development of advanced reading skills through magazine and newspaper articles, essays, short stories, films, and a novel; enhancement of writing skills through experiments with reviews, essays, creative writing, and business and informal Italian. Classroom emphasis on advanced speaking skills and vocabulary building. L5

\* **ITAL 151b, Advanced Italian Workshop: Writing and Translation** Michael Farina

Development of advanced writing and speaking skills. Close readings and extensive practice writing in a variety of genres, which may include autobiography, biography, joke, letter, essay, poem, news article, comic strip, children's book, and short story. Popular narrative genres such as the *giallo* and *romanzo rosa*. Creation and performance of short dramatic texts. L5

\* **ITAL 152b / LITR 188b / THST 191b, Theater Practicum: Machiavelli**

Monica Georgeo

An in-depth study of Machiavelli's *La Mandragola*, culminating in a staged performance of the play in Italian. Major philosophical and political issues raised by the work. Development of high-level linguistic and communicative skills. Prerequisite: ITAL 150 or permission of the instructor. L5, HU

\* **ITAL 159a, History and Culture of Naples** Anna Iacovella

Historical phenomena and literary and cultural movements that have shaped the city of Naples, Italy, from antiquity to the present. The linguistic richness and diversity that characterizes Naples; political, social, and cultural change; differences between standard Italian and the Neapolitan dialect in literature, film, and everyday life. A bridge course between L4 and other L5 courses. Prerequisite: ITAL 140 or equivalent. L5, HU

\* **ITAL 470a and ITAL 471b, Special Studies in Italian Literature** Staff

A series of tutorials to direct students in special interests and requirements. Students meet regularly with a faculty member.

\* **ITAL 491a or b, The Senior Essay** Staff

A research essay on a subject selected by the student in consultation with the faculty adviser.

## Group C Courses

Group C courses are conducted in English and are open to students without previous study of Italian. Majors in Italian are required to read the material and write their papers in Italian.

\* **ITAL 234a, Renaissance Literature, Philosophy, and Art** Angela Capodivacca  
Self-representations of radical novelty in Renaissance texts of literary, philosophical, and visual culture. Outlines of the path to modernity in works by Petrarch, Alberti, Leonardo, Machiavelli, Castiglione, Ariosto, Michelangelo, Aretino, Veronica Franco, Tasso, Cellini, Artemisia Gentileschi, Moderata Fonte, Bruno, Campanella, Galileo, and Vico. HU TR

\* **ITAL 303b / FILM 457b / LITR 359b, Italian Film from Postwar to Postmodern**  
Millicent Marcus

A study of important Italian films from World War II to the present. Consideration of works that typify major directors and trends. Topics include neorealism, self-reflexivity and metacinema, fascism and war, and postmodernism. Films by Fellini, Antonioni, Rossellini, De Sica, Visconti, Pasolini, Bertolucci, Wertmuller, Tornatore, and Moretti. Most films in Italian with English subtitles. HU

**ITAL 310a, Dante in Translation** Christiana Purdy Moudarres

A critical reading of Dante's *Divine Comedy* and selections from the minor works, with an attempt to place Dante's work in the intellectual and social context of the late Middle Ages by relating literature to philosophical, theological, and political concerns. One discussion section conducted in Italian. HU TR

\* **ITAL 317b / HUMS 210b / LITR 180b / RLST 335b / WGSS 317b, Women in the Middle Ages** Christiana Purdy Moudarres

Medieval understandings of womanhood examined through analysis of writings by and/or about women, from antiquity through the Middle Ages. Introduction to the premodern Western canon and assessment of the role that women played in its construction. TR

\* **ITAL 325b / LITR 186b, Italian Representations of Love from Antiquity to the Renaissance** Angela Capodivacca

Representations of love in literature, philosophy, and art from ancient Rome to the Italian Renaissance. Differences in social practices and mores over time. Works from both the classical Latin and the Italian vernacular traditions. Authors include Catullus, Ovid, Vergil, Petronius, Dante, Petrarch, Boccaccio, and Michelangelo. HU TR

**ITAL 384a / FILM 362a / FREN 384a / JDST 289a / LITR 338a, Representing the Holocaust** Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and

authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Life Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

## Judaic Studies

Director of undergraduate studies: Elli Stern, 451 College St., 432-0841, eliyahu.stern@yale.edu; judaicstudies.yale.edu

### FACULTY ASSOCIATED WITH THE PROGRAM OF JUDAIC STUDIES

**Professors** Joel Baden (*Divinity School*), Leslie Brisman (*English*), Steven Fraade (*Chair*) (*Religious Studies*), Paul Franks (*Philosophy*), Christine Hayes (*Religious Studies*), Hannan Hever (*Comparative Literature*), Ivan Marcus (*History, Religious Studies*), Hindy Najman (*Religious Studies*), Steven Smith (*Political Science, Philosophy*), David Sorkin (*History*), Laura Wexler (*Women's, Gender, & Sexuality Studies, American Studies*), Robert Wilson (*Religious Studies*)

**Associate Professors** Marci Shore (*History*), Eliyahu Stern (*Religious Studies, History*)

**Senior Lecturer** Peter Cole (*Comparative Literature*)

**Lecturers** Gabriel Citron (*Philosophy*), Shaun Halper (*History*), Yishai Kiel (*Religious Studies*), Margaret Olin (*Divinity School, History of Art, Religious Studies*)

**Senior Lector II** Ayala Dvoretzky

**Senior Lectors** Shiri Goren, Dina Roginsky

Judaic Studies enables students to develop a substantial knowledge of the history, religion, literature, languages, and culture of the Jews. Jewish society, texts, ideologies, and institutions are examined in comparative perspective in the context of the history and culture of nations in which Jews have lived and created throughout the ages.

The program in Judaic Studies offers courses that encompass all the major epochs of Jewish history: the biblical period, which includes biblical literature and archaeology; the classical period, which includes the literature and history of rabbinic Judaism and its antecedents; the medieval period, which includes Jewish history and literature in both Christian and Islamic lands; the early modern period, which includes Jewish history from the fifteenth through the eighteenth centuries; and the modern period, which includes the history and literature of Jews and Judaism from the late eighteenth to the twenty-first century and the impact of different facets of modernization.

The Judaic Studies major, especially as a second major with Economics (p. 247), Political Science (p. 575), English (p. 276), or History (p. 399), offers intensive background training for those considering admission to graduate or professional schools and to those planning careers in journalism, international relations, foreign service, publishing, the rabbinate, international law, politics, or social work. The interdisciplinary character of the program provides students with both a broad liberal arts background and an intensive preparation in the historical and religious experience of the Jewish culture.



Students considering the major in Judaic Studies should contact the director of undergraduate studies as early as possible.

**Requirements of the major** Prerequisite or corequisite to the major in Judaic Studies are two terms of elementary modern Hebrew (HEBR 110, 120) or the equivalent. The major requires thirteen term courses beyond the prerequisites, including a Hebrew language and literature requirement, a set of core requirements, two areas of concentration, and the senior requirement.

**Hebrew language and literature** Each student majoring in Judaic Studies must attain the equivalent of the second year of modern Hebrew (HEBR 130, 140). In addition, each student must take two term courses in which Hebrew literature is studied in Hebrew, for which HEBR 130 and 140 (but not HEBR 110 or 120) may count. Students who fulfill the Hebrew language requirement by passing an examination rather than by enrolling in HEBR 130 and 140 must take two other term courses in which Hebrew literature is studied in Hebrew. Students concentrating in Hebrew Bible may, in consultation with the director of undergraduate studies, substitute two years of biblical Hebrew for the language and literature requirement.

**Core requirements** Each student must elect at least three from the following: (1) a course in Hebrew Bible; (2) a course in rabbinic literature; (3) JDST 200, History of the Jews and Their Diasporas to Early Modern Times; (4) a course in modern Jewish history or thought; (5) a survey course in Hebrew and Jewish literature.

**Areas of concentration** Students must select two areas of concentration. The standard areas are ancient Israel/Hebrew Bible; Judaism of Second Temple and Talmudic times; Jewish history and civilization of medieval and early modern times; modern Jewish history and civilization; and Jewish/Hebrew literature (requires study of literature in Hebrew). With the approval of the director of undergraduate studies, students may design their own areas of concentration.

In each of the two areas of concentration, students choose three term courses in consultation with the director of undergraduate studies. These are normally expected to include one introductory course; one seminar taken in the junior year and requiring a final research paper; and one relevant course in an area outside Judaic Studies, such as a course relating to the larger historical context if the concentration is in a historical period, or a course in the theory or practice of literature if the concentration is in Jewish or Hebrew literature. Most seminars listed under "Electives within the Major" may be counted as junior seminars in a student's areas of concentration with permission of the director of undergraduate studies.

**Senior requirement** Students are expected to write a one- or two-term senior essay (JDST 491 and 492). If a one-term senior essay is chosen, the student must complete an additional seminar. The one-term essay normally relates to one of the student's areas of concentration, while the seminar relates to the other. A two-term essay should relate to both of the student's areas of concentration. The senior essay, whether completed during one or two terms, should build on one or both of the student's junior seminar papers.

**Study in Israel** Students majoring in Judaic Studies should be aware of the numerous opportunities for study and travel in Israel. Those interested in either a summer or an extended stay in Israel should consult the director of undergraduate studies.

**Courses in the Graduate School** Qualified students may elect courses in the Graduate School with permission of the director of graduate studies, the director of undergraduate studies, and the instructor of the course. They may also offer toward the degree as many as four courses taken in professional schools of the University with permission of the instructors, the director of undergraduate studies, and the dean or registrar of the schools involved. For regulations related to such courses, see Courses in the Yale Graduate and Professional Schools (p. 68) in the Academic Regulations. A list of relevant graduate and professional school courses is available from the director of undergraduate studies.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** HEBR 110, 120 or equivalents

**Number of courses** 13 term courses (incl senior req)

**Specific courses required** HEBR 130 and 140, or two courses in Hebrew lit as specified

**Distribution of courses** 3 courses from (1) Hebrew Bible, (2) rabbinic lit, (3)

JDST 200, (4) modern Jewish history or thought, (5) survey of Hebrew and Jewish lit; 2 areas of concentration, with 3 courses in each (normally 1 intro, 1 junior sem, 1 outside Judaic Studies related to concentration) for a total of 6

**Substitution permitted** 2 years of biblical Hebrew for HEBR 130, 140 or equivalents for students with an area of concentration in Hebrew Bible

**Senior requirement** Two-term senior essay (JDST 491, 492), or one-term senior essay and addtl sem

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### Core Course

**JDST 200a / ER&M 219a / HIST 219a / MMES 149a / RLST 148a, History of the Jews and Their Diasporas to Early Modern Times** Ivan Marcus

A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings. Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP

### Special Project and Senior Essay Courses

\* **JDST 471a or b, Individual Tutorial** Staff

For students who wish, under faculty supervision, to investigate an area in Judaic Studies not covered by regular course offerings. May be used for research or for directed reading, but in either case a long essay or several short ones are required. To apply for admission, a student should present a prospectus with bibliography and a letter of support from the faculty member who will direct the work to the director of undergraduate studies.

\* **JDST 491a and JDST 492b, The Senior Essay** Staff

The essay, written under the supervision of a faculty member, should be a substantial paper between 6,500 and 8,000 words for one term and between 12,500 and 15,000 words for two terms.

## Electives within the Major

### BIBLICAL PERIOD

**JDST 110a / HUMS 349a / RLST 145a, The Bible** Christine Hayes

The writings common to both Jewish and Christian scripture examined as diverse and often conflicting expressions of the religious life and thought of ancient Israel. The works' cultural and historical setting in the ancient Near East; the interpretive history of selected passages influential in Western culture. Introduction to a wide range of critical and literary approaches to biblical studies. Students view course lectures, which survey the entire Bible, on line; class time focuses on specific biblical passages and their subsequent interpretation in Jewish and Christian culture. HU

### CLASSICAL PERIOD

\* **JDST 256a, The Dead Sea Scrolls and the History of Ancient Judaism: The Damascus Document** Steven Fraade

Study of the Damascus Document, one of the most important of the Dead Sea Scrolls. Attention to the document's place in the history of biblical interpretation and ancient Jewish law; the nature and rhetorical function of its textual practices, both narrative and legal; and its relation to the central sectarian writings of the Qumran community. Prerequisite: reading proficiency in ancient Hebrew. L5, HU

\* **JDST 392a / RLST 405a, Mishnah Seminar: Tractate Rosh HaShanah**  
Steven Fraade

Close study of a tractate of the Mishnah, the earliest digest of rabbinic law, and its accompanying Tosefta, dealing with rules for the establishment of New Moons, the intercalation of the lunar calendar, the testimony and examination of witnesses, the festival of the New Year (Rosh HaShanah), and the sounding of the Shofar. Dual attention to the historical significance of the legal and ritual institutions represented and to the cultural significance of the rhetoric of that representation, including the interplay of law and narrative. Prerequisite: reading fluency in ancient Hebrew. L5, HU

\* **JDST 400a / RLST 408a, Midrash Seminar: Exodus 32 and Its Midrashic Development** Christine Hayes

A study of the midrashic career of the Golden Calf story. Examination of the rich and polyphonic tradition of interpretation found in the Bible itself, in ancient translations, and in classical rabbinic sources. Prerequisite: reading proficiency in Hebrew. L5, HU

### MEDIEVAL AND EARLY MODERN PERIODS

**JDST 265b / HIST 345b / MMES 148b / RLST 202b, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries** Ivan Marcus

Jewish culture and society in Muslim lands from the Prophet Muhammad to Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU RP

\* **JDST 270a / HIST 232Ja / HUMS 443a / MMES 342a / RLST 201a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

**MODERN PERIOD**

\* **JDST 278b / HIST 258Jb / RLST 227b, Jewish Citizenship in Modern Europe**

Eliyahu Stern

Seventeenth- to twentieth-century responses to Jewish citizenship in modern European states. Religious law; modern Jewish identity; Zionism; Judaism as a religion vs. a nation; the place of minorities in contemporary Europe. WR, HU

**JDST 289a / FILM 362a / FREN 384a / ITAL 384a / LITR 338a, Representing the Holocaust** Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Lifé Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

**JDST 293b / HIST 248b / RLST 214b, Introduction to Modern Jewish Thought**

Eliyahu Stern

An overview of Jewish philosophical trends, movements, and thinkers from the seventeenth century to the twenty-first. Topics include enlightenment, historicism, socialism, secularism, religious radicalism, and Zionism. HU

**JDST 323a / MMES 160a / NELC 155a, State and Society in Israel** Dina Roginsky

The interplay between the state and society in Israel. Current Israeli discourse on controversial issues such as civil rights in a Jewish-democratic state, Jewish-Arab relations, and right and left politics. Issues of orthodoxy, military service, globalization, and multiculturalism in Israel. Sociopolitical changes that have taken place in Israel since the establishment of the state in 1948 and that have led to the reshaping of Israeli Zionist ideology. HU

**JDST 332a / MMES 197a / RLST 193a, Zionism** Eliyahu Stern

Introduction to the core ideas of the Zionist movement from the mid-nineteenth century to the mid-twentieth. Focus on internal Jewish debates and criticism of the movement by European and Middle Eastern intellectuals. Social, political, cultural, and messianic ideological strands within the movement and their interpretations of various historical experiences and ideas located in the Jewish tradition. HU

## Language and Literature

\* **JDST 213b / HEBR 150b / MMES 150b, Advanced Modern Hebrew: Israeli Society** Shiri Goren

An examination of major controversies in Israeli society. Readings include newspaper editorials and academic articles as well as documentary and historical material. Advanced grammatical structures are introduced and practiced. Conducted in Hebrew. Prerequisite: HEBR 140 or equivalent. L5 RP

\* **JDST 305b / HEBR 158b, Contemporary Israeli Society in Film** Shiri Goren  
Examination of major themes in Israeli society through film, with emphasis on language study. Topics include migration, gender and sexuality, Jewish/Israeli identity, and private and collective memory. Readings in Hebrew and English provide a sociohistorical background and bases for class discussion. Prerequisite: HEBR 140 or permission of instructor. L5, HU RP

\* **JDST 316b / ENGL 456b / HUMS 427b / LITR 348b, The Practice of Literary Translation** Peter Cole

Intensive readings in the history and theory of translation paired with practice in translating. Case studies from ancient languages (the Bible, Greek and Latin classics), medieval languages (classical Arabic literature), and modern languages (poetic texts). HU

\* **JDST 320b, Judaism through Poetry** Peter Cole

Introduction to poetry written by Jews from antiquity to modern times, with attention to the Jewish, Islamic, and Christian cultures that influenced it. Readings include selections from the Bible, the Talmud, and the Dead Sea Scrolls; Hebrew hymns of Byzantine Palestine; Arabized Hebrew verse of Muslim and Christian Spain; and mystical poetry from late antiquity and the Ottoman Empire. Readings in translation. HU

\* **JDST 321a / LITR 277a, Hebrew Modernist Poetry** Hannan Hever

Exploration of modernism in Hebrew poetry. The cultural history of Hebrew modernism; relations to Jewish nationalism; the influence of European literary schools; the avant-garde movement; Hebrew neosymbolism. Close reading of twentieth-century poetic texts in translation, with attention to related literary criticism.

\* **JDST 322b / LITR 316b, Cultural Critique and Israeli Culture** Hannan Hever

Theories of cultural critique, with case studies from Israeli culture. Sources include philosophical and critical works from Karl Marx to the present and cultural products from Israeli literature, film, visual arts, popular music, folklore, and sites of collective memory. No knowledge of Hebrew required. HU, SO

\* **JDST 324b / LITR 413b, Martin Buber's Political Theology** Hannan Hever

The relation between politics and theology in the works of Martin Buber, with a focus on his theory of Hassidism. Buber's own anarchist political theology explored through his writings on the Hassidic community, the kibbutz, and Hassidic political theology. HU

\* **JDST 326a / LITR 317a, Marxism and Literature** Hannan Hever

The role of Marxist thought in understanding literary institutions and texts in the twentieth century. Marx's theory of ideology; Lukacs's theory of literature as the basis for development of Marxist literary theory; the Frankfurt and materialistic schools.

Readings include works by Raymond Williams, Catherine Belsey, Walter Benjamin, Pierre Macherey, and Frederic Jameson. HU, SO

**\* JDST 360a / HEBR 160a / MMES 155a, Hebrew in a Changing World**

Dina Roginsky

Sociological aspects of Modern Hebrew as the language is used in Israel to construct norms, expectations, and daily experiences. Readings and class discussions address changes in Israeli society and culture at large. Prerequisite: HEBR 140. L5

**\* JDST 401a / HEBR 152a, Reading Academic Texts in Modern Hebrew**

Dina Roginsky

Reading of academic texts in modern Hebrew, for students with a strong background in Hebrew. Discussion of grammar and stylistics; special concentration on the development of accuracy and fluency. Prerequisite: HEBR 150 or permission of instructor. Conducted in Hebrew. L5 RP

**\* JDST 409a / HEBR 159a / MMES 159a, Conversational Hebrew: Israeli Media**

Shiri Goren

An advanced Hebrew course for students interested in practicing and enhancing conversational skills. Focus on listening comprehension and on various forms of discussion, including practical situations, online interactions, and content analysis. Prerequisite: HEBR 140 or permission of instructor. L5 RP

## Latin American Studies

Director of undergraduate studies: Aníbal González, Rm. 226, 82–90 Wall St., 432-1149, [anibal.gonzalez@yale.edu](mailto:anibal.gonzalez@yale.edu); [www.yale.edu/macmillan/lais](http://www.yale.edu/macmillan/lais)

### FACULTY ASSOCIATED WITH THE PROGRAM OF LATIN AMERICAN STUDIES

**Professors** Rolena Adorno (*Spanish & Portuguese*), Ned Blackhawk (*History, American Studies*), Richard Burger (*Anthropology*), Hazel Carby (*African American Studies, American Studies*), Carlos Eire (*History, Religious Studies*), Paul Freedman (*History*), Aníbal González (*Spanish & Portuguese*), Roberto González Echevarría (*Spanish & Portuguese*), K. David Jackson (*Spanish & Portuguese*), Gilbert Joseph (*History*), Efsthios Kalyvas (*Political Science*), Mary Miller (*History of Art*), Florencia Montagnini (*Forestry & Environmental Studies*), Stephen Pitti (*History*), Susan Rose-Ackerman (*Law School, Political Science*), Alicia Schmidt Camacho (*American Studies*), Stuart Schwartz (*History*), Susan Stokes (*Political Science*), Robert Thompson (*History of Art*), Noël Valis (*Spanish & Portuguese*), Frederick Wherry (*Sociology*), Elisabeth Wood (*Political Science*)

**Associate Professors** Jafari Allen (*Anthropology, African American Studies*), Robert Bailis (*Forestry & Environmental Studies*), Sean Brotherton (*Anthropology*), Susan Byrne (*Spanish & Portuguese*), Rodrigo Canales (*School of Management*), Moira Fradinger (*Comparative Literature*), Paulo Moreira (*Spanish & Portuguese*)

**Assistant Professors** Ryan Bennett (*Linguistics*), Oswaldo Chinchilla (*Anthropology*), Ana De La O (*Political Science*), Marcela Echeverri (*History*), Anne Eller (*History*), Leslie Harkema (*Spanish & Portuguese*), Seth Jacobowitz (*East Asian Languages & Literatures*),

Albert Laguna (*American Studies*), Kevin Poole (*Spanish & Portuguese*), Dixia Ramirez (*Ethnicity, Race, & Migration*)

**Senior Lecturer** Garry Brewer (*Forestry & Environmental Studies*)

**Senior Lectors II** Margherita Tortora, Sonia Valle

**Senior Lectors** Sybil Alexandrov, Marta Almeida, Maria Pilar Asensio-Manrique, Mercedes Carreras, Ame Cividanes, Sebastián Díaz, Maria De La Paz García, Oscar González-Barreto, María Jordán, Rosamaría León, Juliana Ramos-Ruano, Lissette Reymundi, Lourdes Sabé, Barbara Safille, Terry Seymour, Selma Vital

The major in Latin American Studies is designed to further understanding of the societies and cultures of Latin America as viewed from regional and global perspectives. The Latin American Studies major builds on a foundation of language and literature, history, history of art, theater studies, humanities, and the social sciences; its faculty is drawn from many departments and professional schools of the University.

**The major** The major in Latin American Studies is interdisciplinary. With two goals in mind—intellectual coherence and individual growth—the student proposes a course of study that must satisfy the requirements listed below. The proposed course of study must be approved by the director of undergraduate studies. Though all students choose courses in both the humanities and the social sciences, they are expected to concentrate on one or the other.

Prerequisite to the major is knowledge of the two dominant languages of the region, Spanish and Portuguese. Depending on their interests, students select one language for two years of instruction and the other for one. Other languages necessary for research may in appropriate circumstances be substituted for the second language with the consent of the director of undergraduate studies. Students are encouraged to meet the language requirements as early as possible. Courses used to satisfy the language prerequisite may not be counted toward the major.

The major itself requires twelve term courses: one introductory course approved by the director of undergraduate studies; eight courses related to Latin America from departmental offerings or from a provided list of electives; two additional electives; and the senior essay, LAST 491. The eight Latin American content courses should include courses from the following categories: two courses in the social sciences (anthropology, economics, or political science), two courses in history, two courses in Spanish American or Brazilian literatures beyond the language requirement, and one course in art, architecture, film studies, music, or theater studies. Students wishing to count toward the major courses that do not appear in the program's course offerings should consult with the director of undergraduate studies.

Students must enroll in three seminars or upper-level courses during their junior and senior years. Elective seminars must be approved by the director of undergraduate studies, who can provide a list of appropriate courses.

**The senior essay** The senior essay is a research paper written usually in one term in LAST 491. Students choose their own topics, which may derive from research done in an earlier course. The essay is planned in advance in consultation with a qualified adviser and a second reader.

In preparing the senior essay, Latin American Studies majors may undertake field research in Latin America. Students are encouraged to apply for summer travel grants through the Council on Latin American and Iberian Studies (<http://www.yale.edu/macmillan/lais>) to conduct field research for their senior thesis. The Albert Bildner Travel Prize is awarded to an outstanding junior who submits an application in Spanish or Portuguese in addition to the English application essay. Information about these and other grants is available on Yale's Student Grants & Fellowships Web site (<http://studentgrants.yale.edu>).

**Other courses relevant to the major** A list of courses intended as a guide to students in preparing their programs is available at the office of the director of undergraduate studies and on the Council on Latin American and Iberian Studies Web site (<http://www.yale.edu/macmillan/lais/undergraduate.html>). Qualified students may also elect pertinent courses in the Graduate School and in some of the professional schools with permission of the director of graduate studies or professional school registrar and the director of undergraduate studies.

**Study abroad** Students are strongly encouraged to take advantage of study abroad opportunities during summers or through the Year or Term Abroad program (p. 63).

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** 2 years of 1 lang (Spanish or Portuguese), 1 year of the other

**Number of courses** 12 courses beyond prereqs (incl senior essay)

**Distribution of courses** 1 intro course approved by DUS; 8 courses related to Latin America in specified fields; 2 electives; 3 sems or upper-level courses in junior and senior years

**Senior requirement** Senior essay (LAST 491)

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## Electives within the Major

Students wishing to count toward the major courses that do not appear on this list should consult with the director of undergraduate studies.

### **AFAM 112a / HSAR 379a, New York Mambo: Microcosm of Black Creativity**

Robert Thompson

The rise, development, and philosophic achievement of the world of New York mambo and salsa. Emphasis on Palmieri, Cortijo, Roena, Harlow, and Colón. Examination of parallel traditions, e.g., New York Haitian art, Dominican merengue, reggae and rastas of Jamaican Brooklyn, and the New York school of Brazilian capoeira. HU

### **\* AFAM 336b / AMST 336b / ER&M 315b, Haitian and Dominican Literature and Culture**

Dixa Ramirez

The literature and culture of Haiti, the Dominican Republic, and their diasporas in the United States and Canada since 1804. Focus on texts that explore relations between the two nations, with some attention to each country's individual literary and cultural traditions. Conventional literary texts such as novels and poetry, as well as political documents, orally transmitted texts, and imagery. HU



- \* **AFAM 338a / ENGL 335a / LITR 280a, Caribbean Poetry** Anthony Reed  
Survey of major twentieth-century Caribbean poets such as Derek Walcott, Kamau Brathwaite, and Aimé Césaire. WR, HU
- \* **AMST 441b / HIST 130Jb, Indians and the Spanish Borderlands** Ned Blackhawk  
The experiences of Native Americans during centuries of relations with North America's first imperial power, Spain. The history and long-term legacies of Spanish colonialism from Florida to California. WR, HU
- \* **ANTH 438b, Culture, Power, Oil** Douglas Rogers  
The production, circulation, and consumption of petroleum as they relate to globalization, empire, cultural performance, natural resource extraction, and the nature of the state. Case studies include the United States, Saudi Arabia, Nigeria, Venezuela, and the former Soviet Union. SO  
Anthropology: Sociocultural
- \* **ANTH 474b, Anthropologies of Insurgency** Staff  
An anthropological viewpoint applied to insurgency and to the interlinked categories of rebel, bandit, and freedom fighter. Specific instances of illegal use of force in their sociocultural and historic settings subjected to sociological and micropolitical analysis; consideration of insurgency from the actors' points of view. SO  
Anthropology: Sociocultural
- \* **ECON 467b / GLBL 307b, Economic Evolution of the Latin American and Caribbean Countries** Ernesto Zedillo  
Economic evolution and prospects of the Latin American and Caribbean (LAC) countries. Topics include the period from independence to the 1930s; import substitution and industrialization to the early 1980s; the debt crisis and the "lost decade"; reform and disappointment in the late 1980s and the 1990s; exploration of selected episodes in particular countries; and speculations about the future. Prerequisites: intermediate microeconomics and macroeconomics. SO
- ER&M 200a, Introduction to Ethnicity, Race, and Migration** Alicia Camacho  
Historical roots of contemporary ethnic and racial formations and competing theories of ethnicity, race, and migration. Cultural constructions and social practices of race, ethnicity, and migration in the United States and around the world. HU, SO
- \* **ER&M 300b, Comparative Ethnic Studies** Stephen Pitti  
Introduction to the methods and practice of comparative ethnic studies. Examination of racial formation in the United States within a transnational framework. Legacies of colonialism, slavery, and racial exclusion; racial formation in schools, prisons, and citizenship law; cultural politics of music and performance; social movements; and postcolonial critique. SO
- \* **ER&M 314a / AFAM 324a / AMST 337a, Urban Latina/o Cultures** Dixia Ramirez  
Latina/o urbanism as expressed in literature and culture. Focus on the twentieth and twenty-first centuries, with background on the formation of Latina/o communities in the nineteenth century. Sources include film and the visual arts. HU

\* **EVST 345a / ANTH 382a / F&ES 384a, Environmental Anthropology**

Carol Carpenter

History of the anthropological study of the environment: nature-culture dichotomy, ecology and social organization, methodological debates, politics of the environment, and knowing the environment. SO

\* **EVST 422a / ANTH 409a / F&ES 422a, Anthropology of Climate Change, Past and Present** Michael Dove

The history of thinking regarding climate and society. Climate theory from the classical era and the Enlightenment; modern anthropological literature on social and environmental change, climatic vulnerability and control, and climate knowledge and its circulation. SO

\* **F&ES 020a / EVST 020a, Sustainable Development in Haiti** Gordon Geballe

The principles and practice of sustainable development explored in the context of Haiti's rich history and culture, as well as its current environmental and economic impoverishment. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR

\* **FILM 363b / LITR 360b, Radical Cinemas of Latin America** Moira Fradinger

Introduction to Latin American cinema, with an emphasis on post-World War II films produced in Cuba, Argentina, Brazil, and Mexico. Examination of each film in its historical and aesthetic aspects, and in light of questions concerning national cinema and "third cinema." Examples from both pre-1945 and contemporary films. Conducted in English; knowledge of Spanish and Portuguese helpful but not required. HU

**GLBL 247b / PLSC 128b, Development under Fire** Jason Lyall

The recent emergence of foreign assistance as a tool of counterinsurgency and post-conflict reconciliation. Evaluation of the effects of aid in settings such as Afghanistan, Iraq, Colombia, and the Philippines. Examination of both theory and practice of conducting development work in the shadow of violence. Strengths and weaknesses of different evaluation methods, including randomized control trials (RCTs) and survey experiments. SO

Global Affairs: Development

Global Affairs: Security

\* **HIST 253Ja, Culture, Dissidence, and Control in Golden Age Spain** María Jordán

Aspects of Spanish culture and society in the Golden Age (c. 1550–1650) that demonstrate discontent, dissidence, and suggestions for reform. Emphasis on the intersection of historical and literary sources and the dynamic between popular and elite cultures. WR, HU

History: Preindustrial

**HIST 325a, Introduction to Latin American History** Anne Eller

Critical themes and events in Latin American history from pre-Columbian times to the present. Major formative epochs such as the pre-Columbian era, colonization, independence, and contemporary moments; modern political flashpoints, including Haiti, Cuba, Argentina, and Peru. HU

\* **HIST 362Ja, Cold War in the Third World** Jeremy Friedman

The collapse of colonial empires and the emergence of Asia, Africa, and Latin America during the Cold War. Attempts to develop political and economic systems while negotiating factors such as revolution, socialism, religion, and geopolitics. Conceptual

discourses within and without the developing world surrounding issues such as independence, nationalism, racial identity, violence, social and political order, and economic justice and growth. WR

\* **LAST 030b / ANTH 030b / ARCG 030b, Inca Culture and Society** Richard Burger  
History of the Inca empire of the Central Andes, including the empire's impact on the nations and cultures it conquered. Overview of Inca religion, economy, political organization, technology, and society. Ways in which different schools of research have approached and interpreted the Incas over the last century, including the influence of nationalism and other sources of bias on contemporary scholarship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO

**LAST 150a / ER&M 341a / HIST 358a, History of Mexico since Independence**

Gilbert Joseph

Modern Mexico from the wars of independence in the early nineteenth century to the present. Social, cultural, and economic trends and their relationship to political movements; particular emphasis on the Revolution of 1910 and the long shadow it has cast, and on patterns of relations with the United States. HU

**LAST 232b / ANTH 232b / ARCG 232b, Ancient Civilizations of the Andes**

Richard Burger

Survey of the archaeological cultures of Peru and Bolivia from the earliest settlement through the late Inca state. SO

**LAST 245b / PORT 246b / SPAN 245b, Latin American Film: Brazil, Mexico, and Argentina** Paulo Moreira

An overview of the best cinema produced in Brazil, Mexico, and Argentina; survey of recent films by influential directors from these countries. Comparative discussion of cultures, using the contexts of film production and content. Conducted in English. HU

\* **LAST 266a / SPAN 266a, Studies in Latin American Literature I** Rolena Adorno

An introduction to Spanish American literature from the Conquest to the nineteenth century. Writings of adventurers, poets, and patriots who won the New World in the sixteenth century, forged new cultural identities in the seventeenth and eighteenth centuries, and fought for independence in the nineteenth century. L5, HU

\* **LAST 318a / ARCH 341a, Globalization Space** Keller Easterling

Infrastructure space as a primary medium of change in global polity. Networks of trade, energy, communication, transportation, spatial products, finance, management, and labor, as well as new strains of political opportunity that reside within their spatial disposition. Case studies include free zones and automated ports around the world, satellite urbanism in South Asia, high-speed rail in Japan and the Middle East, agripoles in southern Spain, fiber optic submarine cable in East Africa, spatial products of tourism in North Korea, and management platforms of the International Organization for Standardization. HU

**LAST 361b / HIST 361b, History of Brazil** Stuart Schwartz

Brazilian history from European contact to the reestablishment of civilian government in the 1990s. Focus on the multiethnic nature of Brazilian society, the formation of social and political patterns, and the relationship of people to the environment. HU

**LAST 364b / HIST 363b, Latin America since Independence**

Marcela Echeverri Munoz

An introduction to Latin American history and its global implications, from nineteenth-century independence processes and creation of the region's nations to the twenty-first century. Focus on ways in which the flow of ideas, technology, and people has transformed Latin American politics. Topics include nationalism, race, ethnicity, revolution, development, and democracy. WR, HU

**\* LAST 372a / ER&M 342a / HIST 372Ja, Revolutionary Change and Cold War in Latin America** Gilbert Joseph

Analysis of revolutionary movements in Latin America against the backdrop of the Cold War. Critical examination of popular images and orthodox interpretations. An interdisciplinary study of the process of revolutionary change and cold war at the grassroots level. WR, HU

**\* LAST 377a / HIST 377Ja, Freedom and Abolition in Latin America**

Marcela Echeverri Munoz

The history of freedom in Latin America, with a focus on issues surrounding slavery and abolition. The rise of slavery and slave societies across the region, including context within the founding of European empires in the Americas. Ways in which the lives of freed slaves in Latin America represented a practical freedom that preceded the emergence of Enlightenment abolitionism in the nineteenth century. Relations between black politics, revolution, liberalism, and opposition to slavery. WR, HU

**LAST 393b / LITR 231b / PORT 393b, Modern Brazilian and Portuguese Fiction in Translation** K. David Jackson

An introduction to major writers in modern Brazilian and Portuguese literatures, including J. M. Machado de Assis, Clarice Lispector, João Guimarães Rosa, Fernando Pessoa, and José Saramago. Conducted in English. WR, HU TR

**\* LAST 394a / LITR 294a / PORT 394a, World Cities and Narratives**

K. David Jackson

Study of world cities and selected narratives that describe, belong to, or represent them. Topics range from the rise of the urban novel in European capitals to the postcolonial fictional worlds of major Portuguese, Brazilian, and Spanish American cities. Conducted in English. WR, HU TR

**\* LAST 406a / AFST 420a / EP&E 246a / PLSC 430a, The Politics of Development Assistance** David Simon

Study of development assistance, a dominant feature of the political economies of some of the world's poorest countries. The motivations and politics of aid from donors' perspectives; the political and economic impact of aid on developing countries. Proposals to make aid a more effective instrument of development. SO

**\* LAST 410b / ECON 462b / EP&E 228b / GLBL 316b, The Economics of Human Capital in Latin America** Douglas McKee

Economic issues related to a population's education, skills, and health; focus on contemporary Latin American societies. Determinants of health and education; evaluation of human capital development policies; the role of human capital in a variety of economic contexts, including the labor market, immigration, child investment, intrahousehold bargaining, inequality, and poverty. Prerequisites: intermediate microeconomics and econometrics. SO

\* **LAST 416a / GLOBL 189a / HLTH 325a, Methods and Ethics in Global Health Research** Leslie Curry

Introduction to research methods in global health that recognize the influence of political, economic, social, and cultural factors. Quantitative, qualitative, and mixed-method approaches; ethical aspects of conducting research in resource-constrained settings; the process of obtaining human subjects' approval. Students develop proposals for short-term global health research projects conducted in resource-constrained settings. SO RP

\* **LAST 423b / EP&E 243b / GLOBL 336b / PLSC 423b, Political Economy of Poverty Alleviation** Ana De La O Torres

Overview of classic and contemporary approaches to the question of why some countries have done better than others at reducing poverty. Emphasis on the role of politics. SO

**PLSC 124a / ER&M 317a, The Politics of Migration** Margaret Peters

The politics of migration in both receiving and sending states during the past two hundred years. Focus on current debates over immigration in the United States. Topics include public opinion, interest group politics, the role of institutions, policy formation, and human rights. SO

\* **PLSC 152a / EP&E 245a, Global Firms and National Governments**

Joseph LaPalombara

The type and magnitude of foreign direct investments made by a relatively small number of large firms, and the political influence such firms exercise. Complex challenges raised by powerful global firms emerging from once-dependent and less-developed countries such as China, India, and Brazil. Discussion of the present and probable future relationships between economic and governmental organizations that result from the processes of globalization. Case studies illustrate specific problems faced by both corporate leaders and national and subnational public-policy officials. SO

\* **PLSC 221b / EP&E 323b, U.S. Immigration Law and Policy** Alexandra Dufresne  
Major themes and controversies in American immigration law and policy, including admission and deportation of noncitizens, protection of asylum-seekers and refugees, illegal immigration, strategies of immigration law enforcement, constitutional limits on executive power, the role of administrative agencies and federal courts, and civil rights of noncitizens before and after 9/11. Emphasis on legal reasoning and analysis. Recommended preparation: PLSC 113 and 233. SO

**PLSC 415b / SOCY 172b, Religion and Politics** Sigrun Kahl

Challenges to the view of religion as an archaic force destined to dwindle away in a secularized society. A historical and comparative investigation of the relationship between religion and politics in Europe and the United States, with comparisons to the Muslim world. SO

**PLSC 439b / GLOBL 263b, Challenges of Young Democracies** Ana De La O Torres  
Challenges faced by young democracies, such as organizing free and fair elections, controlling government corruption, building an accountable system of governance, sustaining development, and curtailing conflict and violence. Factors that lead to the consolidation of democratic politics or to stagnation and a return to nondemocratic political systems. SO

\* **PORT 249a or b, Current Issues in Brazilian Culture** Paulo Moreira

Introduction to current cultural issues in Brazil, with an overview of the country's music, art, dance, theater, literature, and cinema. Source materials include literary and nonliterary texts in Portuguese, Web pages, music, and films. Conducted in Portuguese. L5, HU

\* **PORT 410a / LITR 291a, The Brazilian Short Story in Translation**

K. David Jackson

The Brazilian short story from Machado de Assis to the present, confronting the European literary background with Brazilian linguistic, indigenous, and cultural realities. Authors from four literary periods, including Guimarães Rosa and Clarice Lispector, and dominant critical and thematic currents. Conducted in English. WR, HU  
TR

\* **SPAN 250a, Composition and Analysis** Kevin Poole

Composition in Spanish, with a focus on academic writing. Close analysis of language use in literary texts to improve fluidity and precision in students' own writing. Frequent composition assignments to practice the forms and functions studied. L5, HU

**SPAN 368b, The Pilgrimage Road to Santiago** Kevin Poole

A study of the medieval pilgrimage road to Santiago as it exemplified the cultural meanings and material conditions of religious journeys in the late Middle Ages. Examination of literary texts, architecture, art, and music. L5

## Directed Reading and Senior Essay Courses

\* **LAST 471a or b, Directed Reading** Aníbal González Perez

For students who wish to investigate an area of Latin American Studies not covered by regular offerings. The project must terminate with a term paper or its equivalent. No more than one term of credit may be earned. To apply for admission, a student should present a prospectus and a bibliography to the director of undergraduate studies no later than one day before the course selection period concludes. Written approval from the faculty member who will direct the student's reading and writing must accompany the prospectus.

\* **LAST 491a or b, The Senior Essay** Aníbal González Perez

Preparation of a research paper about forty pages long under the direction of a faculty adviser, in either the fall or the spring term. Students write on subjects of their own choice. During the term before the essay is written, students plan the project in consultation with a qualified adviser or the director of undergraduate studies. The student must submit a suitable project outline and bibliography to the adviser and the director of undergraduate studies by the third week of the term. The outline should indicate the focus and scope of the essay topic, as well as the proposed research methodology. Permission may be given to write a two-term essay after consultation with an adviser and the director of undergraduate studies and after submission of a project statement. Only those who have begun to do advanced work in a given area are eligible. The requirements for the one-term senior essay apply to the two-term essay, except that the two-term essay should be substantially longer.

# Linguistics

Director of undergraduate studies: Maria Piñango, 307 DOW, 432-4145, maria.pinango@yale.edu [F]; Raffaella Zanuttini, 209 DOW, 432-2452, raffaella.zanuttini@yale.edu [Sp]; ling.yale.edu

## FACULTY OF THE DEPARTMENT OF LINGUISTICS

**Professors** Stephen Anderson, Robert Frank (*Chair*), † Roberta Frank, Laurence Horn, † Frank Keil, † Joshua Knobe, Nelleke Van Deusen-Scholl (*Adjunct*), † Jason Stanley, † Zoltán Szabó, Raffaella Zanuttini

**Associate Professors** Claire Bower, Ashwini Deo, Gaja Jarosz, Maria Piñango, Kenneth Pugh (*Adjunct*)

**Assistant Professor** Ryan Bennett

**Lecturer** Hannah Haynie, Jim Wood

† A joint appointment with primary affiliation in another department.

Linguistics is the scientific study of language. The major in Linguistics offers a program of study leading toward an understanding of phonological, grammatical, and semantic structure and of various approaches to descriptive, experimental, and historical linguistics. Majors may concentrate on theoretical, experimental, or computational linguistics, on various aspects of comparative grammar, or on a particular family of languages. Interested students should consult the director of undergraduate studies.

Students with no previous background in linguistics are encouraged to approach the field by taking a 100-level course.

The major requires twelve term courses in linguistics and related areas, distributed as follows:

1. Breadth requirement (four courses). All majors must take a course in each of the core areas of phonology (LING 232) and syntax (LING 253). In addition, at least one course must be taken in any two of the six remaining core areas of linguistics: phonetics, morphology, semantics/pragmatics, computational linguistics, language and mind/brain, and historical linguistics.
2. Depth requirement (two courses). In one of the eight core areas of linguistics, students must take two additional courses beyond the introductory level.
3. Electives (four courses). Four additional courses relating to linguistics are required, at least one of which must be at the 200 level or above. Electives may be chosen from courses offered by the Linguistics department or, with approval of the director of undergraduate studies, from related courses in programs such as Anthropology, Classics, Cognitive Science, Computer Science, English, Philosophy, Psychology, or foreign languages.
4. Research requirement (one course). LING 490, Research Methods in Linguistics, is required and is usually taken in the fall term of the senior year.
5. Senior requirement (one course). Students attend a research colloquium and write a senior essay in LING 491 during the spring term of the senior year.

**Combined B.A./M.A. degree program** Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See Simultaneous Award of the Bachelor's and Master's Degrees under Special Arrangements (p. 63) in the Academic Regulations. Interested students should consult the director of undergraduate studies prior to the sixth term of enrollment for specific requirements in Linguistics.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 term courses (incl senior req)

**Specific courses required** LING 232, 253, 490

**Distribution of courses** 1 course each in 2 addtl core areas, as specified; 2 addtl courses beyond intro level in 1 core area; 4 electives, at least 1 at the 200 level or above

**Senior requirement** LING 491

### Introductory Courses

Courses in this group do not require previous study of linguistics.

**LING 110a, Language: Introduction to Linguistics** Jim Wood

The goals and methods of linguistics. Basic concepts in phonology, morphology, syntax, and semantics. Techniques of linguistic analysis and construction of linguistic models. Trends in modern linguistics. The relation of linguistics to psychology, logic, and other disciplines. SO

**LING 112a, Historical Linguistics** Ashwini Deo

Introduction to language change and language history. Types of change that a language undergoes over time: sound change, analogy, syntactic and semantic change, borrowing. Techniques for recovering earlier linguistic stages: philology, internal reconstruction, the comparative method. The role of language contact in language change. Evidence from language in prehistory. HU

\* **LING 115a / SKRT 110a, Introductory Sanskrit I** Staff

An introduction to Sanskrit language and grammar. Focus on learning to read and translate basic Sanskrit sentences in Devanagari script. No prior background in Sanskrit assumed. L1 1½ Course cr

**LING 116b / CGSC 216b, Cognitive Science of Language** Robert Frank

The study of language from the perspective of cognitive science. Exploration of mental structures that underlie the human ability to learn and process language, drawing on studies of normal and atypical language development and processing, brain imaging, neuropsychology, and computational modeling. Innate linguistic structure vs. determination by experience and culture; the relation between linguistic and nonlinguistic cognition in the domains of decision making, social cognition, and musical cognition; the degree to which language shapes perceptions of color, number, space, and gender. SO

\* **LING 121a / AFST 408a / ENGL 340a, English as a World Language** Staff

The spread of the English language around the world and the pluralization of English into many varieties. Key topics, major concepts, theoretical issues, and current debates in the field of world Englishes. Historical and sociopolitical factors that account for the



global spread of English; linguistic implications of that spread; models and frameworks for describing different varieties of English; linguistic and structural features of selected varieties. HU

**LING 125b / SKRT 120b, Introductory Sanskrit II** Staff

Continuation of SKRT 110. Focus on the basics of Sanskrit grammar; readings from classical Sanskrit texts written in Devanagari script. After SKRT 110. L2 1½ Course cr

**LING 138a / SKRT 130a, Intermediate Sanskrit I** Staff

The first half of a two-term sequence aimed at helping students develop the skills necessary to read texts written in Sanskrit. Readings include selections from the *Hitopadesa*, *Kathasaritsagara*, *Mahabharata*, and *Bhagavadgita*. After SKRT 120 or equivalent. L3 1½ Course cr

**LING 148b / SKRT 140b, Intermediate Sanskrit II** Staff

Continuation of SKRT 130, focusing on Sanskrit literature from the *kavya* genre. Readings include selections from the *Jatakamala* of Aryasura and the opening verses of Kalidasa's *Kumarasambhava*. After SKRT 130 or equivalent. L4 1½ Course cr

\* **LING 183b / ENGL 155b, Readings in Old Norse Poetry and Prose: Chronicles of the Vikings** Roberta Frank

An introduction to the language and literature of earliest Norway and Iceland. Texts (to be read in the original) include runic inscriptions left behind by the Vikings, verse of their official skalds, the sometimes irreverent mythological poetry of the Edda, and the sagas telling of the Norse discovery of America. HU

## Intermediate Courses

Some courses in this group have prerequisites; others do not, and may be taken as a student's first course in linguistics.

**LING 205b / AFST 205b, Sociolinguistics** Staff

The relationship between language and society, with a focus on multilingual societies in Africa. Basic concepts and phenomena in sociolinguistics; language choice in multilingual contexts; language shift; birth, maintenance, and death of languages; effects of social factors such as age, sex, and social class on the linguistic choices made by members of a society. SO

**LING 212b, Linguistic Change** Claire Bowern

Principles governing linguistic change in phonology and morphology. Status and independence of proposed mechanisms of change. Relations between the principles of historical change and universals of language. Systematic change as the basis of linguistic comparison; assessment of other attempts at establishing linguistic relatedness.

Prerequisites: LING 112, 232, and 253. SO

\* **LING 215a or b / CGSC 215a or b, Sign Languages and the Mind** Kathryn Zarella

Analysis of sign languages at different levels of linguistic structure, such as phonology, morphology, syntax, and semantics. Related aspects of cognition in the visual modality, including working memory, the neural bases for sign language, and deafness and language development. Ways in which perspectives from manual/visual language study can inform general theories of linguistic structure, plasticity, and domain generality in cognitive science. SO

**LING 220b / PSYC 318b, General Phonetics** Staff

Investigation of possible ways to describe the speech sounds of human languages. Acoustics and physiology of speech; computer synthesis of speech; practical exercises in producing and transcribing sounds. (Formerly LING 120) SO

**\* LING 224a, Formal Foundations of Linguistic Theories** Robert Frank

Study of formal systems that play an important role in the scientific study of language. Exploration of a range of mathematical structures and techniques; demonstrations of their application in theories of grammatical competence and performance including set theory, graphs and discrete structures, algebras, formal language, and automata theory. Evaluation of strengths and weaknesses of existing formal theories of linguistic knowledge. QR

**LING 226a, Formal Foundations of Linguistic Theories II**

Maria Piñango and Ashwini Deo

A study of frameworks for the representation of linguistic knowledge, focusing on the issues of expressiveness (generative capacity) and computational complexity. Constrained grammar formalisms (tree adjoining grammars, categorial grammars, dependency grammars, minimalist grammars), model-theoretic approaches to grammatical representation, probabilistic and optimization-based grammars (optimality theory, harmonic grammars, maximum entropy, stochastic grammars). Prerequisite: LING 224a. QR, SO

**LING 227b / PSYC 327b, Language and Computation** Gaja Jarosz

Design and analysis of computational models of language. Topics include finite state tools, computational morphology and phonology, grammar and parsing, lexical semantics, and the use of linguistic models in applied problems. Prerequisite: Prior programming experience or permission of instructor. (Formerly LING 141) QR, SO

**LING 232a, Introduction to Phonological Analysis** Gaja Jarosz

The structure of sound systems in particular languages. Phonemic and morphophonemic analysis, distinctive-feature theory, formulation of rules, and problems of rule interpretation. Emphasis on problem solving. Prerequisite: LING 220, or a grade of B or above in LING 110. (Formerly LING 132) SO

**LING 233b, The Literate Brain and Mind** Kenneth Pugh

The neurobiological and cognitive foundations of reading and writing. Emerging research on gene-brain-behavior analyses of typically and atypically developing readers. The relationship between speech perception/production and individual differences in literacy learning; distributed brain circuits that support word reading, text comprehension, and second-language learning; the neurobiology of acquired and developmental reading and writing disorders. SO

**\* LING 235b, Phonological Theory** Gaja Jarosz

Topics in the architecture of a theory of sound structure. Motivations for replacing a system of ordered rules with a system of ranked constraints. Optimality theory: universals, violability, constraint types and their interactions. Interaction of phonology and morphology, as well as the relationship of phonological theory to language acquisition and learnability. Opacity, lexical phonology, and serial versions of optimality theory. Prerequisite: LING 232 or permission of instructor. (Formerly LING 135) SO

RP

**\* LING 241b, Field Methods** Claire Bower

Principles of phonetics, phonology, morphology, syntax, and semantics applied to the collection and interpretation of novel linguistic data. Data are collected and analyzed by the class as a group, working directly with a speaker of a relatively undocumented language. Open to majors in Linguistics, and to others with permission of instructor. SO

**\* LING 248b / SAST 379b, Indo-Aryan Languages** Ashwini Deo

Introduction to the Indo-Aryan language family, its linguistic context, and its evolution from the ancient period to the present. Focus on comparative morphosyntax and semantic phenomena, with some attention to issues of classification and contact. SO

**\* LING 251a, Learnability and Development** Gaja Jarosz

An investigation of language learning from an integrated perspective of computational modeling and language development. The mutually informing relationships between computational modeling, linguistic theory, and language acquisition. Prerequisite: LING 232 or permission of instructor. Recommended preparation: LING 227. SO

**LING 253a, Syntax I** Jim Wood

An introduction to the syntax of natural language. Generative syntactic theory and key theoretical concepts. Syntactic description and argumentation. Topics include the structure of clauses and noun phrases, movement operations, and the notion of parameter. (Formerly LING 153) SO

**LING 254b, Syntax II** Raffaella Zanuttini

Recent developments in the principles and parameters approach to syntactic theory. In-depth exploration of theoretical and empirical issues in long-distance dependencies (island effects, dependency types, movement vs. binding), the character of syntactic structure (constituency, thematic mapping, functional categories), and the architecture of grammatical derivations (logical form, operations for structure building, anaphora). Prerequisite: LING 253. SO

**LING 263b, Semantics** Ashwini Deo

Introduction to truth-conditional compositional semantics. Set theory, first- and higher-order logic, and the lambda calculus as they relate to the study of natural language meaning. Some attention to analyzing the meanings of tense/aspect markers, adverbs, and modals. QR, SO

**\* LING 266a, Cognitive Foundations of Meaning Change**

Maria Piñango and Ashwini Deo

Linguistic, cognitive, and communicative structure explored through phenomena involving systematic semantic change. Why evolution in the meanings of forms follows what seem to be constrained trajectorial paths. Whether such semantic change derives from the organizational properties of the human cognitive system or the dynamics of rational communication. Prerequisite or corequisite: LING 112, 231, 263, 275, or 361. SO

**LING 271b / PHIL 271b, Philosophy of Language** Bruno Whittle

An introduction to contemporary philosophy of language, organized around four broad topics: meaning, reference, context, and communication. Introduction to the use of logical notation. HU

\* **LING 280b, Morphology** Jim Wood

The theory of word structure within a formal grammar. Relation to other areas of grammar (syntax, phonology); basic units of word structure; types of morphology (inflection, derivation, compounding). Prerequisites: LING 232 and 253, or permission of instructor. SO

## Advanced Courses and Seminars

\* **LING 356b, The Syntax of Space** Jim Wood

The internal structure of spatial prepositional phrases, with an emphasis on cartographic approaches. Structural similarities between extended prepositional phrases and verb/noun phrases; agreement within prepositional phrases; the syntax of prepositional particles; the representation of figure/ground relations; the Talmian distinction between verb-framed and satellite-framed languages. Prerequisite: LING 253, or with permission of instructor.

\* **LING 363a, Computational Models of Syntax** Robert Frank

Computational techniques for representing the syntax of natural language. Theoretical issues such as formal expressiveness and appropriateness for linguistic description. Parsing complexity, algorithms for grammar learning, and other applied problems in the construction of natural-language processing systems. Minimalist, categorial, tree-adjoining, and dependency grammars. Prerequisite: LING 224 or 227, or with permission of instructor.

## Research Courses

\* **LING 471a and LING 472b, Special Projects** Staff

Special projects set up by students with the help of a faculty adviser and the director of undergraduate studies to cover material not otherwise offered by the department. The project must terminate with at least a term paper or its equivalent and must have the approval of the director of undergraduate studies. Only one term may be offered toward the major; two terms may be offered toward the bachelor's degree.

\* **LING 490a, Research Methods in Linguistics** Maria Piñango

Development of skills in linguistics research, writing, and presentation. Choosing a research area, identifying good research questions, developing hypotheses, and presenting ideas clearly and effectively, both orally and in writing; methodological issues; the balance between building on existing literature and making a novel contribution. Prepares for the writing of the senior essay.

\* **LING 491b, The Senior Essay** Raffaella Zanuttini

Research and writing of the senior essay under the guidance of a faculty adviser. Students present research related to their essays in a weekly colloquium. Prerequisite: LING 490.

## Related Courses

\* **AFST 408a / ENGL 340a / LING 121a, English as a World Language** Staff

The spread of the English language around the world and the pluralization of English into many varieties. Key topics, major concepts, theoretical issues, and current debates in the field of world Englishes. Historical and sociopolitical factors that account for the global spread of English; linguistic implications of that spread; models and frameworks

for describing different varieties of English; linguistic and structural features of selected varieties. HU

**\* ANTH 333a, Bilingualism in Social Context** J. Joseph Errington

The linguistic phenomenon of bilingualism presented through broad issues in social description inseparably linked to it: growth and change in bilingual communities; bilingual usage, social identity, and allegiance; and interactional significances of bilingual speech repertoire use. SO

Anthropology: Linguistic

**\* ANTH 413a, Language, Culture, and Ideology** J. Joseph Errington

Review of influential anthropological theories of culture, with reference to theories of language that inspired or informed them. American and European structuralism; cognitivist and interpretivist approaches to cultural description; the work of Bakhtin, Bourdieu, and various critical theorists. SO RP

Anthropology: Linguistic

**CGSC 110a / PSYC 130a, Introduction to Cognitive Science** Brian Scholl

An introduction to the interdisciplinary study of how the mind works. Discussion of tools, theories, and assumptions from psychology, computer science, neuroscience, linguistics, and philosophy. SO

**\* CHLD 128b / EDST 128b / PSYC 128b, Language, Literacy, and Play**

Nancy Close and Carla Horwitz

The complicated role of play in the development of language and literacy skills among preschool-aged children. Topics include social-emotional, cross-cultural, cognitive, and communicative aspects of play. WR, SO RP

**CPSC 201a or b, Introduction to Computer Science** Staff

Introduction to the concepts, techniques, and applications of computer science. Topics include computer systems (the design of computers and their languages); theoretical foundations of computing (computability, complexity, algorithm design); and artificial intelligence (the organization of knowledge and its representation for efficient search). Examples stress the importance of different problem-solving methods. After CPSC 112 or equivalent. QR

Math: Stat/Applied Math

**[ CPSC 430, Formal Semantics ]**

**CPSC 470a, Artificial Intelligence** Drew McDermott

Introduction to artificial intelligence research, focusing on reasoning and perception. Topics include knowledge representation, predicate calculus, temporal reasoning, vision, robotics, planning, and learning. After CPSC 201 and 202. QR

**GREK 390a, Greek Syntax and Stylistics** Victor Bers

A review of accidence and syntax, elementary composition, and analysis of Greek prose styles of the fifth and fourth centuries B.C., including a comparison of "prosaic" and "poetic" syntax. Prerequisite: previous familiarity with some Greek prose beyond the elementary level, or permission of instructor. L5, HU

**LATN 110a, Beginning Latin: The Elements of Latin Grammar** Staff

Introduction to Latin. Emphasis on morphology and syntax within a structured program of readings and exercises. Prepares for LATN 120. No prior knowledge of Latin assumed. Preregistration, which is required, takes place at the Academic Fair.

See the *Calendar for the Opening Days* or the departmental Web site for details about preregistration. L1 RP 1½ Course cr

**LATN 390b, Latin Syntax and Stylistics** Joseph Solodow

A systematic review of syntax and an introduction to Latin style. Selections from Latin prose authors are read and analyzed, and students compose short pieces of Latin prose. For students with some experience reading Latin literature who desire a better foundation in forms, syntax, idiom, and style. L5, HU

**PHIL 115a, First-Order Logic** Bruno Whittle

An introduction to formal logic. Study of the formal deductive systems and semantics for both propositional and predicate logic. Some discussion of metatheory. QR

**PHIL 267b, Mathematical Logic** Sun-Joo Shin

An introduction to the metatheory of first-order logic, up to and including the completeness theorem for the first-order calculus. Introduction to the basic concepts of set theory. Prerequisite: PHIL 115 or permission of instructor. QR  
Math: Logic/Foundations

\* **PHIL 427b, Computability and Logic** Sun-Joo Shin

A technical exposition of Gödel's first and second incompleteness theorems and of some of their consequences in proof theory and model theory, such as Löb's theorem, Tarski's undefinability of truth, provability logic, and nonstandard models of arithmetic. Prerequisite: PHIL 267 or permission of instructor. QR, HU  
Math: Logic/Foundations

\* **SLAV 202a, Old Church Slavic** Harvey Goldblatt

A study of Old Church Slavic and its place in the history of Church Slavic. The main features and the grammar of Old Church Slavic. The Glagolitic and Cyrillic writing systems. Close readings from Old Church Slavic literary monuments. Old Church Slavic in relation to modern Slavic languages (especially Russian). Prerequisite: elementary knowledge of a Slavic language. Conducted in English. RP

## Literature

Director of undergraduate studies: Moira Fradinger, Rm. 102, 451 College St., 432-4750, maryjane.stevens@yale.edu; complit.yale.edu/literature-major

### FACULTY OF THE LITERATURE MAJOR

**Professors** Dudley Andrew, Peter Brooks (*Emeritus*), Katerina Clark, Roberto González Echevarría, Martin Hägglund, Benjamin Harshav (*Emeritus*), Geoffrey Hartman (*Emeritus*), Hannan Hever, Michael Holquist (*Emeritus*), Carol Jacobs, Rainer Nägele, David Quint (*Chair*), Katie Trumpener

**Associate Professor** Moira Fradinger

**Assistant Professors** David Gabriel, Ayesha Ramachandran

**Senior Lecturer** Peter Cole

**Lecturer** Jan Hagens

**Senior Lectors** Candace Skorupa, Howard Stern

**Affiliated Faculty** Rolena Adorno (*Spanish & Portuguese*), R. Howard Bloch (*French*), Rüdiger Campe (*German*), Francesco Casetti (*Film Studies*), Kang-i Sun Chang (*East Asian Languages & Literatures*), Peter Demetz (*Emeritus*) (*German*), Michael Denning (*American Studies*), Wai Chee Dimock (*English*), Shoshana Felman (*Emeritus*) (*French*), Paul Fry (*English*), Beatrice Gruendler (*Near Eastern Languages & Civilizations*), Karsten Harries (*Philosophy*), Alice Kaplan (*French*), Pericles Lewis (*Yale-NUS College*), Tina Lu (*East Asian Languages & Literatures*), John MacKay (*Slavic Languages & Literatures*), Giuseppe Mazzotta (*Italian*), Christopher L. Miller (*French*), Joseph Roach (*English*), Maurice Samuels (*French*), Henry Sussman (*German*) (*Visiting*), Christopher Wood (*History of Art*), Ruth Yeazell (*English*)

The Literature Major allows students to address fundamental questions about the nature, function, and value of literature in a broadly comparative context. Majors read and write about a wide variety of literary works across periods, genres, and national traditions. They investigate traditional and contemporary approaches to literary study, ancient and modern literary theory, and the relationship of literature to film and to other branches of the arts and sciences.

The Literature Major offers students the freedom to construct a program of study that reflects their intellectual goals. All students planning to major in Literature should register with the director of undergraduate studies, who will work with them to develop a coherent, well-focused sequence of courses suited to their individual interests.

The major offers a number of its own courses, which constitute the core of the program. Other courses are normally chosen from different language and literature programs, many of which offer courses on literature and film in translation. Among these programs are African American Studies (p. 91), Classics (p. 192), East Asian Languages and Literatures (p. 223), English (p. 276), Film Studies (p. 334), French (p. 345), German (p. 373), Italian (p. 449), Near Eastern Languages and Civilizations (p. 549), Portuguese (p. 594), Slavic Languages and Literatures (p. 621), and Spanish (p. 648). Courses in film studies count toward the major in the same way as courses in literature. Students with a particular interest in film or in translation studies may wish to elect the film track or translation track within the Literature major, described below.

The experience of reading a foreign literature in the original language enables us to understand the nature of both language and literature more fully. Prospective Literature majors are strongly encouraged to begin the study of a foreign language as early as possible in their academic careers and to continue such study throughout their time at Yale. Students interested in graduate study in comparative literature should be aware that many programs require reading knowledge of two or three foreign languages.

**Prerequisites** Prospective majors must complete LITR 120 and 122, which may be taken in either order. Completion of the Yale College foreign language distributional requirement is also a prerequisite for entry into the major.

**The standard major** Beyond the prerequisites, the Literature Major requires twelve term courses. These include LITR 300, which should be taken in the sophomore or junior year. They also include two core seminars, one pre-1800 course, one course in drama or poetry, three courses in a foreign literature with readings in the original language, three elective courses, and the senior essay. The three elective courses may be

taken in any literature department and may include two courses in a related discipline that has direct bearing on the student's program in literature, such as history of art, philosophy, anthropology, music, or theater studies. One of the elective courses may be in creative writing.

**Core seminars** In core seminars, LITR 400–480, students focus intensively on particular texts, films, literary and cultural issues, and theoretical problems. Students are required to take at least two core seminars, preferably one in the junior and one in the senior year. The seminars provide training in literary interpretation and theory, preparing students for the senior essay.

**Pre-1800 course requirement** The Literature Major requires at least one course in literature before 1800. Because both genres and individual works of literature refer to, emulate, challenge, and rewrite older works and conventions, students benefit from acquiring a degree of historical perspective. Courses numbered LITR 150–199 fulfill the pre-1800 requirement; courses from other departments may also fulfill the requirement.

**Poetry or drama requirement** In addition to LITR 122 and the pre-1800 course, all students must take one course in poetry or drama. The course may be one offered in a program other than Literature.

**Foreign literature requirement** All majors are required to take at least three additional term courses, beyond the foreign language distributional requirement, in an ancient or modern foreign literature, in which the literature is read in the original language. One or more courses can be taken at a basic literature level (normally equivalent to the third year of language study); however, at least one course must be taken at an advanced level (normally equivalent to the fourth year of language study or higher). Students are encouraged to continue developing their foreign language skills by taking advanced language courses and may, with permission of the director of undergraduate studies, substitute one language course at the L5 level for one of the three required foreign literature courses.

A literature course in translation is sometimes suitable as a foreign literature course. In such cases, Literature majors are expected to request additional assignments from their instructors that demonstrate they have engaged with the texts in the original language. They should fill out a form, signed by the instructor, attesting to their intent to do so. This form is available in the department office in Room 102, 451 College St.; students should submit it to the director of undergraduate studies along with their course schedule.

Nonnative speakers of English who are granted permission by Yale College to complete the foreign language distributional requirement by taking ENGL 114, 120, or 450 may take three additional English literature courses to fulfill the foreign literature requirement of the Literature Major, or they may fulfill the major requirements in a third language.

**The senior essay** In the senior essay, required of all majors, students develop a research topic of their choice and work closely with a faculty adviser. Normally, the essay makes use of texts in the language of their original composition. Any exceptions must be approved by the director of undergraduate studies. Deadlines for the prospectus, the



rough draft, and the completed essay are listed in the course descriptions of the senior essay course (LITR 491 and 492, 493).

The senior essay may be written over one term (LITR 491) or over two terms (LITR 492, 493). Alternatively, students may fulfill the senior essay requirement within the context of a core seminar (the senior seminar essay). Because no more than five students per seminar may elect this option, students should petition the instructor promptly at the beginning of the term. It is understood that students choosing the senior seminar essay will work closely with the instructor throughout the term and produce a substantial paper, approximately thirty pages. Students earn one course credit for the seminar in which the essay is written; no additional course credit is awarded for the essay itself.

Students with an especially well-developed project may petition to write a yearlong senior essay. Interested juniors must apply to the director of undergraduate studies by the last day of classes in the spring term. Students may count the second term of the essay as one elective course toward the total number of courses required for the major. Students expecting to graduate in May enroll in LITR 492 during the fall term and complete their essays in 493 in the spring term. December graduates enroll in 492 in the spring term and complete their essays in 493 during the following fall term. Students planning to begin their essay in the spring term should notify the director of undergraduate studies by the last day of classes in the fall term.

**Credit/D/Fail** For the Class of 2016 and subsequent classes, a maximum of one course taken Credit/D/Fail may count toward the major with permission of the director of undergraduate studies.

**Film track** Students may elect to pursue a film-intensive concentration within the Literature Major. Students in the film track must fulfill the same requirements as those in the standard Literature track, with the following exceptions. Film-track students take LITR 143 instead of LITR 122 as one of the prerequisites to the major. They take two foreign literature courses rather than three; neither may be substituted with an advanced language course. In addition, students in the film track must take one course in film theory and must choose their three electives from courses in film studies.

**Translation track** Students may elect to pursue a translation concentration within the Literature Major. Students in the translation track must fulfill the same requirements as those in the standard Literature track, with the following exceptions. Instead of LITR 122, translation-track students take as one of the prerequisites to the major LITR 348 or another course in the theory and practice of translation approved by the director of undergraduate studies. Translation-track students must also choose their three electives from courses that engage with some aspect of translation studies; the office of the director of undergraduate studies maintains a list of qualifying courses.

**Intensive major** Students in the intensive major complete three courses each in two non-anglophone literatures, in all of which the literature is read in the original language. Three of these courses take the place of the three electives in the non-intensive major. Intensive majors must also demonstrate proficiency at the L5 level in one of their languages and at the L4 level or above in the other. Students taking the intensive major in three national literatures must take two courses each in two national

literatures and three in a third. They must demonstrate proficiency at the L<sub>5</sub> level in the language of their principal literature, and at the L<sub>4</sub> level or above in the other two.

**Year or term abroad** The Literature Major encourages students to consider spending a summer, a term, or a year abroad. Courses taken on international programs may, with permission of the director of undergraduate studies, be applied to the Literature Major's foreign literature requirement.

**Foreign literature courses** The following table lists languages in which advanced literature instruction is available at Yale, specifying courses that fulfill the basic and advanced literature requirements for the major. Courses with numbers higher than those listed also normally fulfill the requirement, providing that they focus on literature (rather than language) and that the literature is read in the original language.

<b>Language</b>	<b>Basic Literature Course</b>	<b>Advanced Literature Course</b>
Arabic	ARBC 150, 151	ARBC 161 or 165
Chinese	CHNS 150, 151	CHNS 170 or 171
French	FREN 170	Courses in French numbered 200 or higher
German	Courses in German numbered 170 or higher	Courses in German numbered 200 or higher
Ancient Greek	GREK 131 or 141	Ancient Greek courses numbered 400 or higher
Modern Hebrew	By arrangement with instructor	By arrangement with instructor
Italian	Courses in Italian numbered 200 or higher	Courses in Italian numbered 200 or higher
Japanese	JAPN 150, 151	JAPN 170 or 171
Korean	KREN 150, 151	EALL 470 or 471
Latin	LATN 131 or 141	Latin courses numbered 400 or higher
Persian	PERS 150	PERS 150
Portuguese	By arrangement with instructor	By arrangement with instructor
Russian	RUSS 150, 151	Courses in Russian numbered 170 or higher
Spanish	SPAN 261, 262, 266, or 267	Courses in Spanish numbered 300 or higher

Other ancient and modern languages, including those from Africa, South Asia, and the Middle East, may be suitable for the Literature Major if a qualified faculty adviser is available to supervise the major.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** *All tracks* – LITR 120; completion of Yale College foreign lang distributional req; *Standard track* – LITR 122; *Film track* – LITR 143; *Translation track* – LITR 348 or equivalent

**Number of courses** 12 term courses beyond prereqs (incl senior essay)

**Specific course required** LITR 300

**Distribution of courses** *All tracks*—1 course in lit before 1800; 1 course in poetry or drama; 2 core sems; *Standard track*—3 courses in 1 foreign lit, as specified; 3 electives, as specified; *Film track*—2 courses in 1 foreign lit, as specified; 1 course in film theory; 3 electives in film studies; *Translation track*—3 courses in 1 foreign lit, as specified; 3 electives in translation studies

**Substitution permitted** *Standard and translation tracks*—1 advanced lang course for 1 of 3 req foreign lit courses, with DUS permission

**Senior requirement** One-term senior essay (LITR 491); or two-term senior essay (LITR 492 and 493); or 1 core sem (LITR 400–480) with senior sem essay

**Intensive major** 3 adttl courses in a second foreign lang in place of 3 electives; demonstrated command of the second foreign lang to L4 level

## Freshman Seminars

**LITR 017a, Western Drama and Theater from 1400 to the Present** Jan Hagens  
Close reading of exemplary dramas in the Western tradition from the late medieval period to the present, with some attention to critical texts about the history of Western drama. Changing conceptions of what a play is and does; drama's developing theatrical context; underlying world views. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **LITR 091b / CLCV 008b / HUMS 074b / MGRK 001b / RSEE 008b, Western Visions of Greece** George Syrimis

Literary, philosophical, political, and aesthetic categories used by Western cultures since the Enlightenment to construct the concepts "Hellenic" and "ancient Greece." The refiguring of ancient Greek civilization as an ideal cultural template, symbolic origin, and philosophical reflection for both European philhellenes and contemporary Greeks. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

## Prerequisites and Required Courses

**LITR 120a, Introduction to Narrative** Staff

A team-taught course that examines how narratives work and what they do. Emphasis on fictional form, the mechanics of plot, and questions of time and duration. Texts are drawn from a variety of periods and cultures, and include folktales, short stories, novels, case studies, graphic novels, and films. WR, HU

**LITR 122b, World Poetry and Performance** Staff

A team-taught course that examines lyric and epic poetry, drama, film, song, and performance. Texts are drawn from a broad range of cultures and time periods. Emphasis on how poetic and dramatic forms shape the stories they tell, on the social and cultural uses to which these forms are put, on the relationship between text and performance, and on historical and cross-cultural connections among texts. WR, HU

**LITR 143b / FILM 240b, World Cinema** Dudley Andrew

Development of ways to engage films from around the globe productively. Close analysis of a dozen complex films, with historical contextualization of their production and cultural functions. Attention to the development of critical skills. Includes weekly screenings, each followed immediately by discussion. WR, HU

**LITR 300b / ENGL 300b, Introduction to Theory of Literature** Carol Jacobs

An examination of concepts and assumptions in contemporary views of literature. Theories of meaning, interpretation, and representation. Critical analysis of formalist, psychoanalytic, structuralist, poststructuralist, Marxist, and feminist approaches to theory and to literature. HU

\* **LITR 348b / ENGL 456b / HUMS 427b / JDST 316b, The Practice of Literary Translation** Peter Cole

Intensive readings in the history and theory of translation paired with practice in translating. Case studies from ancient languages (the Bible, Greek and Latin classics), medieval languages (classical Arabic literature), and modern languages (poetic texts).

HU

## The Ancient World

\* **LITR 154a / ENGL 395a / HUMS 165a, The Bible as Literature** Leslie Brisman

Study of the Bible as a literature—a collection of works exhibiting a variety of attitudes toward the conflicting claims of tradition and originality, historicity and literariness. Pre-1800 with completion of supplementary assignments in the language of the King James Bible. If there is sufficient interest, a second section will be offered. WR, HU RP

\* **LITR 168a / ENGL 129a / HUMS 198a, Tragedy in the European Literary Tradition**  
Staff

The genre of tragedy from its origins in ancient Greece and Rome through the European Renaissance to the present day. Themes of justice, religion, free will, family, gender, race, and dramaturgy. Works include Homer's *Iliad* and plays by Aeschylus, Sophocles, Euripides, Seneca, Shakespeare, Racine, Ibsen, Chekhov, Brecht, Beckett, and Soyinka. Focus on textual analysis and on developing the craft of persuasive argument through writing. WR, HU

\* **LITR 169a or b / ENGL 130a or b / HUMS 199a or b, Epic in the European Literary Tradition** Staff

The epic tradition traced from its foundations in ancient Greece and Rome to the modern novel. The creation of cultural values and identities; exile and homecoming; the heroic in times of war and of peace; the role of the individual within society; memory and history; politics of gender, race, and religion. Works include Homer's *Odyssey*, Vergil's *Aeneid*, Dante's *Inferno*, Cervantes's *Don Quixote*, and Joyce's *Ulysses*. Focus on textual analysis and on developing the craft of persuasive argument through writing. WR, HU

## Medieval and Early Modern Literature to 1800

**LITR 177b / ENGL 171b / HUMS 160b, Chaucer and Medieval London**

Ardis Butterfield

Chaucer's writings explored through the human and physical landscape of medieval London and Westminster. The crowds, sounds, and visual stimuli of the city examined

alongside literary genres in which the author wrote, including dream visions, love epic, lyrics, and comic, satiric, and religious narrative. Chaucer's sense of the writer's craft as a means of imagining space and sound and of depicting the emotional resonance of urban street scenes. HU

\* **LITR 180b / HUMS 210b / ITAL 317b / RLST 335b / WGSS 317b, Women in the Middle Ages** Christiana Purdy Moudarres

Medieval understandings of womanhood examined through analysis of writings by and/or about women, from antiquity through the Middle Ages. Introduction to the premodern Western canon and assessment of the role that women played in its construction. TR

\* **LITR 181a / EALL 236a / HUMS 435a, Japanese Poetry and Poetics**  
Edward Kamens

Core concepts and traditions of classical Japanese poetry explored through the medium of translation. Readings from anthologies and treatises of the ninth through early twentieth centuries. Attention to recent critical studies in transcultural poetic theory. Inspection and discussion of related artifacts in the Beinecke Rare Book and Manuscript Library and the Yale University Art Gallery. Readings and discussion in English. HU

\* **LITR 186b / ITAL 325b, Italian Representations of Love from Antiquity to the Renaissance** Angela Capodivacca

Representations of love in literature, philosophy, and art from ancient Rome to the Italian Renaissance. Differences in social practices and mores over time. Works from both the classical Latin and the Italian vernacular traditions. Authors include Catullus, Ovid, Vergil, Petronius, Dante, Petrarch, Boccaccio, and Michelangelo. HU TR

\* **LITR 187b / ENGL 180b, Literature of the Renaissance** Lawrence Manley  
A study of Renaissance masterworks from 1340 to 1635. Focus on classical humanism and its contributions to literature, politics, religion, philosophy, and the arts. Overview of major literary and intellectual developments; key literary genres; the rhetorical mobility and intellectual versatility of Renaissance writers. Techniques of close and contextual reading. HU

\* **LITR 188b / ITAL 152b / THST 191b, Theater Practicum: Machiavelli**  
Monica Georgeo

An in-depth study of Machiavelli's *La Mandragola*, culminating in a staged performance of the play in Italian. Major philosophical and political issues raised by the work. Development of high-level linguistic and communicative skills. Prerequisite: ITAL 150 or permission of the instructor. L5, HU

## European Literature since 1800

\* **LITR 201b / GMAN 247b / HUMS 227b, Goethe's Wilhelm Meister** Kirk Wetters  
A detailed study of Goethe's two Wilhelm Meister novels. *Wilhelm Meister's Apprenticeship* as the first novel of the nineteenth century and the prototypical novel of education (Bildungsroman); *Wilhelm Meister's Journeyman Years* as an unconventional sequel in which Goethe shows his unwillingness to repeat the model of his earlier breakthrough work. Readings and discussion in English. HU TR

**LITR 202a / HUMS 228a / RUSS 260a, Nabokov and World Literature**

Marijeta Bozovic

Vladimir Nabokov's writings explored in the context of his life story and of the structures and institutions of literary life in Russian émigré circles. Themes of exile, memory, and nostalgia; hybrid cultural identities and cosmopolitan elites; language and bilingualism; the aims and aesthetics of émigré and diasporic modernism in novels and other media. Additional readings from works of world literature inspired and influenced by Nabokov. Readings and discussion in English. WR, HU

\* **LITR 205a / HUMS 212a / RUSS 321a, Capitalism and the Nineteenth-Century European Novel** Bella Grigoryan

The cultural significance and literary representations of capitalism in nineteenth-century Europe. Labor and leisure; material culture and consumerism; social and geographic mobility; constitution of the modern self; the public sphere; private life; economics and literary form. Works by Balzac, Gogol, Dickens, Dostoevsky, and Zola supplemented by selections from theoretical writings. Readings and discussion in English. WR, HU TR

\* **LITR 207a / ENGL 243a / HUMS 428a / MGRK 214a / WGSS 215a, Modern Literature and the Eastern Mediterranean** George Syrimis

The formative influences of Sappho and C. P. Cavafy on the Anglo-American literary tradition from the twentieth century to the present. Nationalism and imperialism, sexuality and aesthetics, biography and art, sapphic verse, the reception of the classical tradition, and the topography of modernity. Writers' fascination with the eastern Mediterranean as an alternative locus for modern Greek, English, and American identities. HU

**LITR 214b / FREN 240b / HUMS 201b, The Modern French Novel**

Alice Kaplan and Maurice Samuels

A survey of major French novels, considering style and story, literary and intellectual movements, and historical contexts. Writers include Balzac, Flaubert, Proust, Camus, and Sartre. Readings in translation. One section conducted in French. HU TR

\* **LITR 220b / CZEC 301b / RSEE 300b, Milan Kundera: The Czech Novelist and French Thinker** Karen von Kunes

Close reading of Kundera's novels, with analysis of his aesthetics and artistic development. Relationships to French, German, and Spanish literatures and to history, philosophy, music, and art. Topics include paradoxes of public and private life, the irrational in erotic behavior, the duality of body and soul, the interplay of imagination and reality, the function of literary metaphor, and the art of composition. Readings and discussion in English. HU TR

\* **LITR 226b / GMAN 240b, German Modernism** Henry Sussman

Introduction to the radical innovations of modernism as it was forged, received, and revised in German-speaking Europe from c. 1880 to 1945. Literary experiments in dissonance and multifaceted suggestion; strategies in criticism and elucidation demanded by modernist works. Some attention to parallels in painting and music. Readings in English translation. Priority to German Studies majors. HU RP

\* **LITR 227a / HUMS 243a / RUSS 333a, The Living Dead in Literature**

Molly Brunson

A study of ghosts, vampires, cyborgs, animated artworks, and other supernatural beings in Slavic, western European, and American literature and culture. The thematic, historical, and epistemological significance of violating the border between life and death in art. Analysis of novels, short stories, folklore, visual arts, and theoretical texts. Readings and discussion in English. HU

**LITR 231b / LAST 393b / PORT 393b, Modern Brazilian and Portuguese Fiction in**

**Translation** K. David Jackson

An introduction to major writers in modern Brazilian and Portuguese literatures, including J. M. Machado de Assis, Clarice Lispector, João Guimarães Rosa, Fernando Pessoa, and José Saramago. Conducted in English. WR, HU TR

\* **LITR 234a / FREN 355a, Camus and the Postwar Era** Alice Kaplan

The literary and political career of French-Algerian writer Albert Camus (1913–60). His major novels and essays read both from a stylistic point of view and in the context of World War II, the Algerian War, and debates over terrorism, the death penalty, and humanitarianism. HU TR

\* **LITR 235b / FREN 342b / HUMS 250b, French Literary Movements from**

**Romanticism to Decadence** Yue Zhuo

A study of key texts, ideas, and events that shaped literary history in the nineteenth and early twentieth centuries, from romanticism, realism, and naturalism to Symbolism and Decadence. Literary works by Chateaubriand, Mme de Staël, Constant, Mérimée, Balzac, Baudelaire, Zola, Rimbaud, Mallarmé, Maupassant, Huysmans, and Proust. HU TR

**LITR 244a / GMAN 234a, German Fairy Tales** Henry Sussman

The influence of German fairy tales on the genre of fiction and on the emergence of psychology, psychoanalysis, and folklore. The fairy tale's relation to romanticism; the importance of childhood sensibility to the fields of education, psychology, criticism, and cybernetics; the expansion of children's literature into new mass media. HU

## Non-European Literature since 1800

**LITR 254b / EALL 248b, Modern Chinese Literature** Jing Tsu

An introduction to modern Chinese literature. Themes include cultural go-betweens; sensations in the body; sexuality; diaspora, translation, and nationalism; globalization and homeland; and everyday life. No knowledge of Chinese required. HU TR

\* **LITR 277a / JDST 321a, Hebrew Modernist Poetry** Hannan Hever

Exploration of modernism in Hebrew poetry. The cultural history of Hebrew modernism; relations to Jewish nationalism; the influence of European literary schools; the avant-garde movement; Hebrew neosymbolism. Close reading of twentieth-century poetic texts in translation, with attention to related literary criticism.

\* **LITR 280a / AFAM 338a / ENGL 335a, Caribbean Poetry** Anthony Reed

Survey of major twentieth-century Caribbean poets such as Derek Walcott, Kamau Brathwaite, and Aimé Césaire. WR, HU

**LITR 283a / SPAN 391a, Magical Realism** Roberto González Echevarría  
Twentieth-century Latin American novels and short stories in which the fantastic appears. Their derivation from avant-garde trends, the Catholic cultural tradition of miracles, and indigenous and African beliefs. Attention to the relationships between literature and religion and between fiction and visual arts. Conducted in English; a section in Spanish available depending on demand. HU

\* **LITR 291a / PORT 410a, The Brazilian Short Story in Translation**

K. David Jackson

The Brazilian short story from Machado de Assis to the present, confronting the European literary background with Brazilian linguistic, indigenous, and cultural realities. Authors from four literary periods, including Guimarães Rosa and Clarice Lispector, and dominant critical and thematic currents. Conducted in English. WR, HU  
TR

\* **LITR 294a / LAST 394a / PORT 394a, World Cities and Narratives**

K. David Jackson

Study of world cities and selected narratives that describe, belong to, or represent them. Topics range from the rise of the urban novel in European capitals to the postcolonial fictional worlds of major Portuguese, Brazilian, and Spanish American cities. Conducted in English. WR, HU  
TR

## Literary Theory and Special Topics

**LITR 301b / HUMS 204b / RUSS 380b, Putin's Russia and Protest Culture**

Marijeta Bozovic

Survey of Russian literature and culture since the fall of communism. The chaos of the 1990s; the solidification of power in Putin's Russia; the recent rise of protest culture. Sources include literature, film, and performances by art collectives. Readings and discussion in English; texts available in Russian. WR, HU

\* **LITR 304a / FILM 357a / GMAN 408a, Books, Displays, and Systems Theory**

Henry Sussman

A status report on the book as a medium in an age of cybernetic technology and virtual reality. The contentious no-man's land between books and contemporary systems. HU  
RP

\* **LITR 316b / JDST 322b, Cultural Critique and Israeli Culture** Hannan Hever

Theories of cultural critique, with case studies from Israeli culture. Sources include philosophical and critical works from Karl Marx to the present and cultural products from Israeli literature, film, visual arts, popular music, folklore, and sites of collective memory. No knowledge of Hebrew required. HU, SO

\* **LITR 317a / JDST 326a, Marxism and Literature** Hannan Hever

The role of Marxist thought in understanding literary institutions and texts in the twentieth century. Marx's theory of ideology; Lukacs's theory of literature as the basis for development of Marxist literary theory; the Frankfurt and materialistic schools. Readings include works by Raymond Williams, Catherine Belsey, Walter Benjamin, Pierre Macherey, and Frederic Jameson. HU, SO



\* **LITR 319a / GMAN 313a, Eccentric Realism** Rainer Nägele

Reexamination of accepted concepts of "the real" through close readings of German nineteenth-century realist short stories and novellas by Keller, Stifter, and C. F. Meyer. Prerequisite: GMAN 150 or equivalent. HU

\* **LITR 323a / ENGL 336a / THST 303a, The Opera Libretto** J. D. McClatchy

A selective survey of the genre from its seventeenth-century Italian origins to the present day. The libretto's history, from *opera seria* to *opéra comique* to melodrama, featuring libretti by Hofmannsthal, W. S. Gilbert, and Auden. Emphasis on literary adaptations, from Da Ponte and Beaumarchais to Britten and Thomas Mann. Source material includes works by Shakespeare, Schiller, Hugo, Melville, and Tennessee Williams. Readings in English; musical background not required. WR, HU

\* **LITR 328b / HUMS 277b / MGRK 212b, Folktales and Fairy Tales**

Maria Kaliambou

History of the folktale from the late seventeenth through the late twentieth centuries. Basic concepts, terminology, and interpretations of folktales, with some attention to twentieth-century theoretical approaches. Performance and audience, storytellers, and gender-related distinctions. Interconnections between oral and written traditions in narratives from western Europe and Greece. HU TR

\* **LITR 334b / GMAN 191b, Problems of Lyric** Howard Stern

Masterpieces of European and American lyric studied in relation to the various determinants of poetry: grammar and logic, meter and rhyme, self-consciousness and performativity, myth and theme. Poets include Brecht, Rilke, Goethe, Frost, and Elizabeth Bishop. Reading knowledge of German or French useful but not required. HU

**LITR 338a / FILM 362a / FREN 384a / ITAL 384a / JDST 289a, Representing the Holocaust** Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Life Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

## Film

\* **LITR 359b / FILM 457b / ITAL 303b, Italian Film from Postwar to Postmodern**  
Millicent Marcus

A study of important Italian films from World War II to the present. Consideration of works that typify major directors and trends. Topics include neorealism, self-reflexivity and metacinema, fascism and war, and postmodernism. Films by Fellini, Antonioni, Rossellini, De Sica, Visconti, Pasolini, Bertolucci, Wertmuller, Tornatore, and Moretti. Most films in Italian with English subtitles. HU

\* **LITR 360b / FILM 363b, Radical Cinemas of Latin America** Moira Fradinger

Introduction to Latin American cinema, with an emphasis on post-World War II films produced in Cuba, Argentina, Brazil, and Mexico. Examination of each film in its historical and aesthetic aspects, and in light of questions concerning national cinema

and "third cinema." Examples from both pre-1945 and contemporary films. Conducted in English; knowledge of Spanish and Portuguese helpful but not required. HU

\* **LITR 361a / FILM 305a, History and Theory of Animation** Aaron Gerow  
Survey of the history and theory of animation. Examples from around the world, from various traditions, and from different periods. HU

\* **LITR 362b / FILM 346b / GMAN 225b, Intermediality in Film** Brigitte Peucker  
The relationship of film to theater and painting, with the suggestion that where two media are in evidence, there is usually a third. Topics include space, motion, color, theatricality, tableau vivant, ekphrasis, spectatorship, and new media. Readings feature art-historical and film-theoretical texts as well as essays pertinent to specific films. HU

\* **LITR 365b / EALL 275b / FILM 389b, Crime in Japanese Film and Fiction**  
Aaron Gerow  
The depiction of crime in Japanese film and fiction, with a focus on the detective and gangster genres. Social, historical, and aesthetic implications, as well as differences from Euro-American and Asian crime films. HU

## Core Seminars

Two seminars are required for Literature majors; nonmajors may be admitted with permission of the instructor.

\* **LITR 413b / JDST 324b, Martin Buber's Political Theology** Hannan Hever  
The relation between politics and theology in the works of Martin Buber, with a focus on his theory of Hassidism. Buber's own anarchist political theology explored through his writings on the Hassidic community, the kibbutz, and Hassidic political theology. HU

\* **LITR 415b / ENGL 334b, James Joyce and Marcel Proust** Marta Figlerowicz  
Close reading of James Joyce's *Ulysses* and selections from Marcel Proust's *In Search of Lost Time*. The novels' modernist context, including questions about subjectivity, attention and distraction, consciousness and the unconscious, and aesthetic form. Issues raised by contemporaneous works in psychoanalysis, psychology, and aesthetic criticism, as well as by recent accounts of modernism. HU

\* **LITR 417a / THST 426a, Maps and the Western Literary Imagination**  
Ayesha Ramachandran  
The influence of mapping and changing notions of space on literary form, from the cartographic revolution of the sixteenth century to the modern spatial-digital revolution of GPS mapping. Spatial literacy in verbal and visual texts; maps in books and as books; literary uses of mapping practices; recent literary theory on the spatial turn. Works by More, Camões, Montaigne, Voltaire, Pynchon, Walcott, and Chamoiseau. Use of the map collections in Yale's Sterling Memorial and Beinecke libraries. HU

\* **LITR 419b, Modernist Poetry** Staff  
Introduction to modernist poetry and poetics in comparative perspective. Poetry and theoretical texts from Europe and the United States, as well as from Mexico City, Beirut, and Beijing. Defining modernism, including when it began and whether it is now over; the role of magazines its origins and development; its distinctive mixture of the very old with the very new. HU

\* **LITR 426a / ENGL 357a / WGSS 340a, Feminist and Queer Theory**

Moira Fradinger

Historical survey of feminist and queer theory from the Enlightenment to the present, with readings from key British, French, and American works. Focus on the foundations and development of contemporary theory. Shared intellectual origins and concepts, as well as divergences and conflicts, among different ways of approaching gender and sexuality. WR, HU

\* **LITR 439a / GMAN 308a, Rilke and Yeats** Carol Jacobs

Close readings of individual works by Rainer Maria Rilke and William Butler Yeats, with an eye to the theoretical implications of their writings. HU TR

\* **LITR 451a, Autobiography and Fiction** Katerina Clark

Close reading of a variety of works of fiction that present themselves as autobiographies. Texts include works by Augustine, Rousseau, Goethe, Joyce, Sartre, and Coetzee, as well as slave narratives and trial confessions. HU

\* **LITR 457a / GMAN 268a / HUMS 262a, W. G. Sebald** Carol Jacobs

Close readings of the major works of W. G. Sebald along with texts of other authors who played a direct role in these writings, including Thomas Browne, Grimmelshausen, Kafka, and Heshel. Texts in relation to theory of literature in terms of memory, representation, identity, ethical imperatives, and intertextual and intermedia relations. HU

\* **LITR 463a / ENGL 353a / HUMS 295a, Medieval Celtic Literature** David Gabriel

Major texts of Celtic literature, focusing on works from the birth of vernacular literature in the Middle Ages to the early modern period. Cultural, historical, and literary issues surrounding works in the Irish and Welsh languages; literary culture in Breton, Cornish, Scottish Gaelic, and Manx. Genres include lyric and bardic poetry, heroic and religious narrative, and early Arthurian works. Readings in English translation; no knowledge of Celtic languages assumed. HU TR

\* **LITR 470a / GMAN 226a, Faust** Jan Hagens

The development of the Faust motif through time, from the legend's origins in the Renaissance-Reformation period to twentieth-century variations. Readings from the English adaptation of the original German chapbook, Marlowe's *Doctor Faustus*, Goethe's *Faust (Part I)*, and Thomas Mann's *Doctor Faustus*; screenings of films with a Faustian theme. HU

\* **LITR 472a, Art and Revolution in Cuba, Algeria, and Palestine** Staff

The relation of artistic practices to political upheaval. Ways in which moments of political crisis create new possibilities for art; the compatibility of political and artistic revolutions. Case studies include the Cuban revolution, the Algerian revolution, and the ongoing conflict in Israel and Palestine. HU

\* **LITR 473a, Politics and Literature in the Middle East** Staff

Laurence Sterne's *Tristram Shandy* and *A Sentimental Journey* explored in the context of contemporary criticism and modern literary theory. *Tristram Shandy*'s famously experimental nature; its historical context, as well as its place in the development of the eighteenth-century British novel and its importance to the changing nature of the printed book. Additional readings from the works of Swift, John Locke, Ephraim Chambers, the Sciblerians, Diderot, Machado de Assis, Gogol, and others. HU

\* **LITR 488a or b, Directed Reading and/or Individual Research** Staff

Special projects in an area of the student's particular interest set up with the help of a faculty adviser and the director of undergraduate studies. Projects must cover material not otherwise offered by the department, must terminate in at least a term paper or its equivalent, and must have the approval of the director of undergraduate studies. Enrollment limited to Literature majors.

## Senior Courses

\* **LITR 491a or b, The Senior Essay** Staff

An independent writing and research project. The senior essay is due in the office of the director of undergraduate studies according to the following schedule: (1) by September 5 (for LITR 491a) or January 16 (for LITR 491b), a three-page prospectus signed by the student's adviser; (2) by October 17 (for LITR 491a) or March 6 (for LITR 491b), a full rough draft (not notes); (3) by December 5 (for LITR 491a) or April 10 (for LITR 491b), the completed essay. The minimum length for an essay is twenty-five pages. Students are urged to arrange a topic and adviser early in the term before the term in which the essay is to be written.

\* **LITR 492a and LITR 493b, The Yearlong Senior Essay** Staff

An extended research project. Students must petition the curriculum committee for permission to enroll by the last day of classes in the term preceding enrollment in LITR 492. For students expecting to graduate in May, the senior essay is due in the office of the director of undergraduate studies according to the following schedule: (1) by September 5, a three-page prospectus signed by the student's adviser; (2) by January 16, a full rough draft (not notes); (3) by April 10, the completed essay. December graduates should consult the director of undergraduate studies for required deadlines. The minimum length for a yearlong senior essay is forty pages.

## Mathematics

See also **Applied Mathematics** (p. 130).

Director of undergraduate studies: Andrew Casson, 216 LOM, 432-7056,  
andrew.casson@yale.edu; math.yale.edu

### FACULTY OF THE DEPARTMENT OF MATHEMATICS

**Professors** Donald Brown, Andrew Casson, Ronald Coifman, Igor Frenkel, Howard Garland, Alexander Goncharov, Roger Howe, Peter Jones, Mikhail Kapranov, Gregory Margulis, Yair Minsky, Vincent Moncrief, Hee Oh, David Pollard, Vladimir Rokhlin, Peter Schultheiss (*Emeritus*), Van Vu, Gregg Zuckerman

**Associate Professor** Sam Payne

**Assistant Professors** Amanda Folsom, Alexander Kontorovich

**J. W. Gibbs Assistant Professors** Kim Dang, Steven Frankel, Daniel Fresen, José L. González, Jiuzu Hong, Nathan Kaplan, Thomas Koberda, Roy Lederman, You Qi, Stefan Steinerberger, Giulio Tiozzo, Peng Zhao

**Adjunct Professors** Michael Frame, Gil Kalai, Alex Lubotzky

**Lecturers** Marketa Havlickova, Anna Lachowska, James Rolf

**Statistics Faculty** Andrew Barron, Joseph Chang, Lisha Chen, John Hartigan (*Emeritus*), Balaji Raman, Jing Zhang

Mathematics has many aspects: it is the language and tool of the sciences, a cultural phenomenon with a rich historical tradition, and a model of abstract reasoning. The course offerings and the major in Mathematics reflect these multiple facets. The Mathematics major provides a broad education in various areas of mathematics in a program flexible enough to accommodate many ranges of interest.

**Placement in courses** The department offers a three-term sequence in calculus, MATH 112, 115, and 120. Students who have not taken calculus at Yale and who wish to enroll in calculus must take the mathematics online placement examination. They must then bring their exam results, as well as other pertinent information such as Advanced Placement test scores, to the calculus preregistration session, held at the beginning of each term in 432 DL. Advisers will be on hand at the registration session to assist each student in enrolling in the appropriate course. A link to the online placement examination and additional information is available on the departmental Web site (<http://math.yale.edu/undergrad/placement-exam>).

MATH 112 is an introductory course that presupposes basic skills in high school algebra, geometry, and trigonometry. Enrolling students are expected to know the basic definitions of the trigonometric functions, synthetic division, factorization, and elementary area and volume formulas of plane and solid geometry. MATH 115 presupposes familiarity with the topics covered in MATH 112. MATH 120 presupposes familiarity with the topics covered in MATH 115.

MATH 230, 231 is an advanced course in linear algebra and introductory analysis for students with exceptionally strong backgrounds in mathematics. Students who wish to enroll in MATH 230 should consult with the instructor of the course. After MATH 115, students with a strong interest in abstract mathematics should consider taking MATH 230, 231.

**B.A. and B.S. degree programs** The prerequisite for each program is calculus through the level of MATH 120, or the equivalent.

Each program normally consists of ten term courses in Mathematics numbered 222 or higher, including MATH 480. These ten may include no more than five term courses from other institutions. Each student is expected to take vector calculus and linear algebra: either MATH 230 and 231, or one of MATH 222 or 225 and MATH 250. To acquire both depth and breadth in the field, students are required to take at least two term courses in each of three of the following five categories: analysis, algebra and number theory, statistics and applied mathematics, geometry and topology, and logic and foundations. Each major program must also include at least one course in at least two of the three core areas: real analysis, algebra, and complex analysis. Taking courses from all three core areas is strongly recommended. To be eligible for Distinction in the Major, a student must have completed at least one course from each of the three core areas. The categories and core areas to which each course belongs are indicated in the course listings.

A candidate for the B.S. degree must take at least two advanced term courses in the physical sciences, such as CHEM 328, 332, 333, or PHYS 401, 402, in addition to the ten term courses required for the B.A. degree. Such courses require the approval of the director of undergraduate studies; written approval is advised.

Any student interested in pursuing further study in pure mathematics should include MATH 301, 305, 310, 350, 370, and 430 in his or her program, and should consider taking one or more graduate-level courses. Students interested in applications of mathematics should include MATH 300 or 301, 310, 350, and a selection of courses from MATH 241, 242, 244, 246, 251, 260, and CPSC 440.

**Senior requirement** During the senior year students majoring in Mathematics normally take the senior seminar (MATH 480). Alternatively, with the consent of the director of undergraduate studies, highly qualified students may write a senior essay in MATH 470 under the guidance of a faculty member, and give an oral report to the department. Students wishing to write a senior essay should consult the director of undergraduate studies early in the fall term.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

**Courses related to mathematics** Each Mathematics major is urged to acquire additional familiarity with the uses of mathematics by taking courses in Applied Mathematics (p. 130), Computer Science (p. 210), Engineering and Applied Science (p. 273), Economics (p. 247), Philosophy (p. 557), Physics (p. 565), Statistics (p. 656), or other departments. In some instances a limited number of such courses may be counted among the ten courses required for the major in Mathematics, with the approval of the director of undergraduate studies.

Each year the Mathematics and Statistics departments offer a large number of graduate courses, some of which are accessible to undergraduates with advanced preparation in mathematics. Further information may be obtained from the directors of undergraduate studies whose permission, with that of the relevant director of graduate studies, is required for admission.

**The intensive major** Candidates for a degree with an intensive major in Mathematics must take courses in all three of the core areas: real analysis, algebra, and complex analysis. Intensive majors are also expected to include at least two graduate term courses in the Mathematics department, or equivalent independent study, in their programs. Familiarity with the material of the following courses is prerequisite to graduate courses in each category: *algebra*: two courses between 350 and 399; *analysis*: MATH 301, 305, 310; *algebraic topology*: MATH 301, 350; *logic and foundations*: MATH 270.

**Combined B.S./M.S. degree program** Students who, by the end of their senior year, complete the requirements of the department for the M.S. in Mathematics will be eligible to receive this degree at their Senior Commencement. Required are: (1) eight term courses numbered 500 or higher, most of which must be completed with grades of B or better; (2) a reading knowledge of mathematical literature in a foreign language of importance for mathematical research (normally French, German, or Russian); (3) satisfactory performance on a general oral examination.

The master's program is in no sense a substitute for the B.A. or B.S. program; rather, it is designed to accommodate a very few exceptional students who, by means of accelerated or independent study, can satisfy the department as to their command of the content of the normal undergraduate program. Candidates must submit a proposal that foresees this level of achievement by the end of junior year to the director of undergraduate studies no later than the last day of classes in their fifth term of enrollment in Yale College. If approved by the department this proposal will be forwarded to the Dean's Office. Students' status and progress will be reviewed before they are permitted to continue in the program in the senior year. For more information on Yale College requirements for the program, see Simultaneous Award of the Bachelor's and Master's Degrees in the Academic Regulations.

Students take at least two graduate term courses in the junior year (normally courses in algebra or analysis are the first graduate courses taken). The general oral examination covers a list of topics available from the director of graduate studies and will be accepted in lieu of the usual senior oral presentation. Details concerning the requirements for the master's degree may be obtained from the director of graduate studies.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** MATH 120 or equivalent

**Number of courses** *B.A.* – 10 term courses numbered 222 or higher, incl MATH 480; *B.S.* – same, with 2 addtl courses in physical sciences

**Specific courses required** MATH 230 and 231; or MATH 222 or 225, and MATH 250

**Distribution of courses** *B.A.* – 2 courses in each of 3 categories chosen from analysis, algebra and number theory, stat and applied math, geometry and topology, logic and foundations; courses from 2 of 3 core areas, as specified; *B.S.* – same, with 2 addtl advanced courses in physical sciences approved by DUS

**Substitution permitted** With DUS permission, certain courses in Applied Math, Comp Sci, Engineering & Applied Science, Econ, Phil, Physics, Stat

**Intensive major** Courses in all 3 core areas; 2 grad courses or equivalent independent study counted among the required courses

**Senior requirement** Senior sem (MATH 480) or, with DUS permission, senior essay (MATH 470) and oral report

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\* **MATH 101b, Geometry of Nature** Michael Frame

Geometric patterns in nature, including classical models of spirals in seashells and sunflowers, symmetry of honeycombs and snowflakes, and the curvature of soap films; the shape of the universe; ways to visualize the fourth dimension; and a brief introduction to fractal geometry. Enrollment limited to freshmen and sophomores who have not previously taken a high school or college calculus course. QR

#### [ MATH 107, Mathematics in the Real World ]

\* **MATH 112a or b, Calculus of Functions of One Variable I** Staff

Limits and their properties. Definitions and some techniques of differentiation and the evaluation of definite integrals, with applications. Use of the software package Mathematica to illustrate concepts. No prior acquaintance with calculus or computing assumed. Online preregistration is required; see Calculus Advising and Preregistration (<http://math.yale.edu/calculus-advising-and-preregistration>) for details. QR

**\* MATH 115a or b, Calculus of Functions of One Variable II** Staff

A continuation of MATH 112. Applications of integration, with some formal techniques and numerical methods. Improper integrals, approximation of functions by polynomials, infinite series. Exercises involve the software package Mathematica. After MATH 112 or equivalent; open to freshmen with some preparation in calculus. May not be taken after MATH 116. Online preregistration is required; see Calculus Advising and Preregistration (<http://math.yale.edu/calculus-advising-and-preregistration>) for details. QR

**\* MATH 116a or b, Mathematical Models in the Biosciences I: Calculus Techniques**

Michael Frame

Introduction to topics in mathematical modeling that are applicable to biological systems. Discrete and continuous models of population, neural, and cardiac dynamics. Stability of fixed points and limit cycles of differential equations. Applications include Norton's chemotherapy scheduling and stochastic models of tumor suppressor gene networks. After MATH 112 or equivalent. May not be taken after MATH 115. QR

**\* MATH 118a or b, Introduction to Functions of Several Variables** Staff

A combination of linear algebra and differential calculus of several variables. Matrix representation of linear equations, Gauss elimination, vector spaces, independence, basis and dimension, projections, least squares approximation, and orthogonality. Three-dimensional geometry, functions of two and three variables, level curves and surfaces, partial derivatives, maxima and minima, and optimization. Intended for students in the social sciences, especially Economics. May not be taken after MATH 120 or 222. Prerequisite: MATH 112. QR

**\* MATH 120a or b, Calculus of Functions of Several Variables** Staff

Analytic geometry in three dimensions, using vectors. Real-valued functions of two and three variables, partial derivatives, gradient and directional derivatives, level curves and surfaces, maxima and minima. Parametrized curves in space, motion in space, line integrals; applications. Multiple integrals, with applications. Divergence and curl. The theorems of Green, Stokes, and Gauss. After MATH 115, or with permission of instructor. May not be taken after MATH 121. Online preregistration is required; see Calculus Advising and Preregistration (<http://math.yale.edu/calculus-advising-and-preregistration>) for details. QR

**[ MATH 170, Mathematical Patterns in the Natural World ]**

**MATH 190a, Fractal Geometry** Michael Frame

A visual introduction to the geometry of fractals and the dynamics of chaos, accessible to students not majoring in science. Study of mathematical patterns repeating on many levels and expressions of these patterns in nature, art, music, and literature. QR

**\* MATH 199a, Mathematical Problem Solving** Staff

Study of a variety of techniques for solving challenging mathematical problems. Topics include the pigeon-hole principle, probabilities, congruences, generating functions, polynomials, and basic number theory. Open to students with beginning, intermediate, or advanced problem-solving skills. ½ Course cr

**MATH 222a or b / AMTH 222a or b, Linear Algebra with Applications** Staff

Matrix representation of linear equations. Gauss elimination. Vector spaces. Linear independence, basis, and dimension. Orthogonality, projection, least squares approximation; orthogonalization and orthogonal bases. Extension to function spaces.



Determinants. Eigenvalues and eigenvectors. Diagonalization. Difference equations and matrix differential equations. Symmetric and Hermitian matrices. Orthogonal and unitary transformations; similarity transformations. After MATH 115 or equivalent.

May not be taken after MATH 225. QR

Math: Algebra/Number Theory

**MATH 225a or b, Linear Algebra and Matrix Theory** Staff

An introduction to the theory of vector spaces, matrix theory and linear transformations, determinants, eigenvalues, and quadratic forms. Some relations to calculus and geometry are included. After or concurrently with MATH 120. May not be taken after MATH 222. QR

Math: Algebra/Number Theory

Psychology: AdvSci NeuroTrk

**MATH 228a, From Euclid to Einstein** Roger Howe

An introduction to the fundamental role of symmetry in geometry. The role of transformations in Euclidean geometry; use of transformations to describe non-Euclidean geometries; a geometric interpretation of Einstein's special theory of relativity. A geometric introduction to linear algebra. QR

Math: Geometry/Topology

\* **MATH 230a, Vector Calculus and Linear Algebra I** Giulio Tiozzo

A careful study of the calculus of functions of several variables, combined with linear algebra. QR

Math: Algebra/Number Theory

\* **MATH 231b, Vector Calculus and Linear Algebra II** Staff

Continuation of MATH 230. Application of linear algebra to differential calculus. Inverse and implicit function theorems; the idea of a manifold; integration of differential forms; general Stokes' theorem. QR

Math: Analysis

\* **MATH 235b, Reflection Groups** Anna Lachowska

Concepts of linear algebra are used to explore the algebraic and geometric properties of groups generated by reflections. Examples from reflection groups introduce elements of group theory, Lie algebras, and representation theory. Reflections in a real Euclidean space, groups generated by reflections, crystallographic groups, and Coxeter groups. Preference to sophomores majoring in mathematics or the sciences. Prerequisite:

MATH 222 or 225. QR

Math: Algebra/Number Theory

**MATH 241a / STAT 241a, Probability Theory** David Pollard

Introduction to probability theory. Topics include probability spaces, random variables, expectations and probabilities, conditional probability, independence, discrete and continuous distributions, central limit theorem, Markov chains, and probabilistic modeling. After or concurrently with MATH 120 or equivalent. QR

Math: Stat/Applied Math

**MATH 242b / STAT 242b, Theory of Statistics** Andrew Barron

Study of the principles of statistical analysis. Topics include maximum likelihood, sampling distributions, estimation, confidence intervals, tests of significance, regression, analysis of variance, and the method of least squares. Some statistical

computing. After STAT 241 and concurrently with or after MATH 222 or 225, or equivalents. QR

Math: Stat/Applied Math

**MATH 244a / AMTH 244a, Discrete Mathematics** Nathan Kaplan

Basic concepts and results in discrete mathematics: graphs, trees, connectivity, Ramsey theorem, enumeration, binomial coefficients, Stirling numbers. Properties of finite set systems. Recommended preparation: MATH 115 or equivalent. QR

Math: Stat/Applied Math

Math: Algebra/Number Theory

**MATH 246a or b, Ordinary Differential Equations** Staff

First-order equations, second-order equations, linear systems with constant coefficients. Numerical solution methods. Geometric and algebraic properties of differential equations. After MATH 120 or equivalent; after or concurrently with MATH 222 or 225 or equivalent. QR

Math: Stat/Applied Math

Math: Analysis

**MATH 247b / AMTH 247b / G&G 247b, Partial Differential Equations** Igor Frenkel

Introduction to partial differential equations, wave equation, Laplace's equation, heat equation, method of characteristics, calculus of variations, series and transform methods, and numerical methods. Prerequisites: MATH 222 or 225, MATH 246, and ENAS 194, or equivalents. QR

Math: Stat/Applied Math

**MATH 250a, Vector Analysis** Roger Howe

Calculus of functions of several variables, using vector and matrix methods. The derivative as a linear mapping. Inverse and implicit function theorems. Transformation of multiple integrals. Line and surface integrals of vector fields. Curl and divergence. Differential forms. Theorems of Green and Gauss; general Stokes' theorem. After MATH 120, and 222 or 225 or equivalent. QR

Math: Analysis

**MATH 251b / STAT 251b, Stochastic Processes** Sahand Negahban

Introduction to the study of random processes, including Markov chains, Markov random fields, martingales, random walks, Brownian motion, and diffusions. Techniques in probability, such as coupling and large deviations. Applications chosen from image reconstruction, Bayesian statistics, finance, probabilistic analysis of algorithms, and genetics and evolution. After STAT 241 or equivalent. QR

Math: Stat/Applied Math

**MATH 260a / AMTH 260a, Basic Analysis in Function Spaces** Kim Dang

Diagonalization of linear operators, with applications in physics and engineering; calculus of variations; data analysis. MATH 260 is a natural continuation of PHYS 301. Prerequisites: MATH 120, and 222 or 225. QR

Math: Stat/Applied Math

**MATH 270a, Set Theory** Gregg Zuckerman

Algebra of sets; finite, countable, and uncountable sets. Cardinal numbers and cardinal arithmetic. Order types and ordinal numbers. The axiom of choice and the well-ordering theorem. After MATH 120 or equivalent. QR

Math: Logic/Foundations

[ **MATH 290, Fractal Geometry: Concepts and Applications** ]

**MATH 300b, Topics in Analysis** Andrew Casson

An introduction to analysis, with topics chosen from infinite series, the theory of metric spaces, and fixed-point theorems with applications. Students who have taken MATH 230, 231 should take MATH 301 instead of this course. After MATH 250 or with permission of instructor. QR

Math: Core Real Analysis

Math: Analysis

\* **MATH 301a, Introduction to Analysis** Peter Jones

Foundations of real analysis, including metric spaces and point set topology, infinite series, and function spaces. After MATH 230, 231 or equivalent. QR

Math: Core Real Analysis

Math: Analysis

**MATH 305b, Real Analysis** Staff

The Lebesgue integral, Fourier series, applications to differential equations. After MATH 301 or with permission of instructor. QR

Math: Analysis

Math: Core Real Analysis

**MATH 310a, Introduction to Complex Analysis** Gregory Margulis

An introduction to the theory and applications of functions of a complex variable. Differentiability of complex functions. Complex integration and Cauchy's theorem. Series expansions. Calculus of residues. Conformal mapping. After MATH 231 or 250 or equivalent. QR

Math: Analysis

Math: Stat/Applied Math

Math: Core Complex Analysis

\* **MATH 315b, Intermediate Complex Analysis** Staff

Continuation of MATH 310. Topics may include argument principle, Rouché's theorem, Hurwitz theorem, Runge's theorem, analytic continuation, Schwarz reflection principle, Jensen's formula, infinite products, Weierstrass theorem. Functions of finite order, Hadamard's theorem, meromorphic functions. Mittag-Leffler's theorem, subharmonic functions. After MATH 310. QR RP

Math: Analysis

Math: Core Complex Analysis

\* **MATH 320a, Measure Theory and Integration** Staff

Construction and limit theorems for measures and integrals on general spaces; product measures;  $L_p$  spaces; integral representation of linear functionals. After MATH 305 or equivalent. QR RP

Math: Analysis

Math: Core Real Analysis

\* **MATH 325b, Introduction to Functional Analysis** Daniel Fresen

Hilbert, normed, and Banach spaces; geometry of Hilbert space, Riesz-Fischer theorem; dual space; Hahn-Banach theorem; Riesz representation theorems; linear

operators; Baire category theorem; uniform boundedness, open mapping, and closed graph theorems. After MATH 320. QR RP

Math: Core Real Analysis

Math: Analysis

**MATH 330b / STAT 330b, Advanced Probability** David Pollard

Measure theoretic probability, conditioning, laws of large numbers, convergence in distribution, characteristic functions, central limit theorems, martingales. Some knowledge of real analysis assumed. QR

Math: Stat/Applied Math

\* **MATH 345b, Modern Combinatorics** Van Vu

Recent developments and important questions in combinatorics. Relations to other areas of mathematics such as analysis, probability, and number theory. Topics include probabilistic method, random graphs, random matrices, pseudorandomness in graph theory and number theory, Szemerédi's theorem and lemma, and Green-Tao's theorem.

Prerequisite: MATH 244. QR

Math: Algebra/Number Theory

Math: Stat/Applied Math

**MATH 350a, Introduction to Abstract Algebra** Staff

Group theory, structure of Abelian groups, and applications to number theory. Symmetric groups and linear groups including orthogonal and unitary groups; properties of Euclidean and Hermitian spaces. Some examples of group representations. Modules over Euclidean rings, Jordan and rational canonical forms of a linear transformation. After MATH 222 or equivalent. QR

Math: Core Algebra

Math: Algebra/Number Theory

**MATH 353a, Introduction to Representation Theory** Anna Lachowska

An introduction to basic ideas and methods of representation theory of finite groups and Lie groups. Examples include permutation groups and general linear groups. Connections with symmetric functions, geometry, and physics. After MATH 222 or equivalent.

Math: Algebra/Number Theory

\* **MATH 354b, Number Theory** Nathan Kaplan

Prime numbers; quadratic reciprocity law, Gauss sums; finite fields, equations over finite fields; zeta functions. After MATH 350. QR

Math: Algebra/Number Theory

[ **MATH 360, Introduction to Lie Groups** ]

**MATH 370b, Fields and Galois Theory** Marketa Havlickova

Rings, with emphasis on integral domains and polynomial rings. The theory of fields and Galois theory, including finite fields, solvability of equations by radicals, and the fundamental theorem of algebra. Quadratic forms. After MATH 350. QR

Math: Algebra/Number Theory

Math: Core Algebra

[ **MATH 373, Algebraic Number Theory** ]

**MATH 380a, Modern Algebra I** Jiuzu Hong

A survey of algebraic constructions and theories at a sophisticated level. Topics include categorical language, free groups and other free objects in categories, general theory of rings and modules, artinian rings, and introduction to homological algebra. After MATH 350 and 370. QR RP

Math: Algebra/Number Theory

Math: Core Algebra

**MATH 381b, Modern Algebra II** Gregg Zuckerman

Topics in commutative algebra: general extension of fields; Noetherian, local, and Dedekind rings. Introduction to valuation theory. Rudiments of algebraic geometry. After MATH 380. QR RP

Math: Algebra/Number Theory

Math: Core Algebra

**[ MATH 400, Introduction to Mathematical Mechanics ]****[ MATH 430, Introduction to Algebraic Topology ]****MATH 435b, Differential Geometry** Vincent Moncrief

Applications of calculus to the study of the geometry of curves and surfaces in Euclidean space, intrinsic differential geometric properties of manifolds, and connections with non-Euclidean geometries and topology. After MATH 231 or 250 or equivalent. QR

Math: Geometry/Topology

**[ MATH 440, Introduction to Algebraic Geometry ]****\* MATH 480a or b, Senior Seminar: Mathematical Topics** Staff

A number of mathematical topics are chosen each term – e.g., differential topology, Lie algebras, mathematical methods in physics – and explored in one section of the seminar. Students present several talks on the chosen topic. One section each year is devoted to topics of interest to Economics and Mathematics majors, and is co-taught by a member of the Economics department.

**OTHER COURSES RELATED TO MATHEMATICS****CPSC 201a or b, Introduction to Computer Science** Staff

Introduction to the concepts, techniques, and applications of computer science. Topics include computer systems (the design of computers and their languages); theoretical foundations of computing (computability, complexity, algorithm design); and artificial intelligence (the organization of knowledge and its representation for efficient search). Examples stress the importance of different problem-solving methods. After CPSC 112 or equivalent. QR

Math: Stat/Applied Math

**CPSC 365b, Design and Analysis of Algorithms** Daniel Spielman

Paradigms for problem solving: divide and conquer, recursion, greedy algorithms, dynamic programming, randomized and probabilistic algorithms. Techniques for analyzing the efficiency of algorithms and designing efficient algorithms and data structures. Algorithms for graph theoretic problems, network flows, and numerical linear algebra. Provides algorithmic background essential to further study of computer science. After CPSC 202 and 223. QR

Math: Stat/Applied Math

**CPSC 440b, Numerical Computation** Vladimir Rokhlin

Algorithms for numerical problems in the physical, biological, and social sciences: solution of linear and nonlinear systems of equations, interpolation and approximation of functions, numerical differentiation and integration, optimization. After CPSC 112 or an equivalent introductory programming course; MATH 120; and MATH 222 or 225 or CPSC 202. QR

Math: Stat/Applied Math

**PHIL 267b, Mathematical Logic** Sun-Joo Shin

An introduction to the metatheory of first-order logic, up to and including the completeness theorem for the first-order calculus. Introduction to the basic concepts of set theory. Prerequisite: PHIL 115 or permission of instructor. QR

Math: Logic/Foundations

\* **PHIL 427b, Computability and Logic** Sun-Joo Shin

A technical exposition of Gödel's first and second incompleteness theorems and of some of their consequences in proof theory and model theory, such as Löb's theorem, Tarski's undefinability of truth, provability logic, and nonstandard models of arithmetic.

Prerequisite: PHIL 267 or permission of instructor. QR, HU

Math: Logic/Foundations

## Mathematics and Philosophy

Directors of undergraduate studies: Andrew Casson (Mathematics), 216 LOM, 432-7056, [andrew.casson@yale.edu](mailto:andrew.casson@yale.edu); Daniel Greco (Philosophy), 106A C, 432-1659, [daniel.greco@yale.edu](mailto:daniel.greco@yale.edu)

The Mathematics and Philosophy major allows students to explore those areas where philosophy and mathematics meet, in particular, mathematical and philosophical logic and the philosophy of mathematics.

The prerequisite for the major is MATH 120. The major requires twelve term courses including the prerequisite, at least four of which must be in Mathematics at the 200 level or higher and five of which must be in Philosophy. All Philosophy courses are eligible for credit toward the major, with the exception of First-Order Logic (PHIL 115). Required courses include Set Theory (MATH 270), Mathematical Logic (PHIL 267), Computability and Logic (PHIL 427), an additional advanced Philosophy course with a substantive logical component, and one seminar in either Mathematics or Philosophy (other than PHIL 427) that fulfills the senior requirement (see below). Set Theory (MATH 270) and Mathematical Logic (PHIL 267) must be taken before the end of the junior year; it is strongly recommended that they be taken earlier.

**Senior requirement** Each year certain seminars offered by the Mathematics and Philosophy departments are designated as fulfilling the senior requirement of the combined major. If such a seminar is taken in order to fulfill the senior requirement, majors must consult with the instructor and agree upon additional work required. Typically, additional work includes a substantial class presentation and/or preparation of a series of drafts prior to submission of the final paper.

The Mathematics seminar MATH 480, Senior Seminar: Mathematical Topics, fulfills the senior requirement. For Philosophy seminars that fulfill the senior requirement, consult the director of undergraduate studies in Philosophy.

A typical program satisfying the major might consist of MATH 120, 222 or 225, 270, 300, 350, and a designated seminar; PHIL 126, 267, 427, a designated seminar (other than PHIL 427), and two additional electives.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** MATH 120

**Number of courses** 12 term courses (incl prereq and senior sem)

**Distribution of courses** At least 4 courses in Math at 200 level or higher; at least 5 courses in Phil, as specified

**Specific courses required** MATH 270, PHIL 267, 427

**Senior requirement** Senior sem

## Mathematics and Physics

Adviser for the major: Vincent Moncrief, 64 SPL, 432-6930,  
vincent.moncrief@yale.edu

The major in Mathematics and Physics allows students to explore the productive interaction between the two subjects more extensively than either individual major. Prerequisites to the major include MATH 120 or its equivalent, an introductory physics lecture sequence numbered PHYS 180, 181 or above, and the associated laboratory sequence PHYS 205L, 206L. Beyond the prerequisites, the major requires a minimum of fourteen term courses above the introductory level, including the senior project. At least six of these must be Mathematics courses numbered 222 or above, and at least six must be advanced Physics courses chosen in consultation with the adviser for the major. A senior project in PHYS 471 or 472 on a topic appropriate for the combined major and acceptable to both the Physics and the Mathematics departments is also required. The student must present an oral report on this project to the Mathematics department.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** MATH 120 or equivalent; PHYS 180, 181, or 200, 201, or 260, 261; PHYS 205L, 206L

**Number of courses** 14 term courses beyond prereqs, incl senior req

**Distribution of courses** 6 Math courses numbered 222 or above; 6 advanced Physics courses selected in consultation with major adviser

**Senior requirement** Senior project in PHYS 471 or 472 on topic acceptable to both depts; oral report on project to Math dept

## Mechanical Engineering

Director of undergraduate studies: Corey O'Hern, M203 ML, 432-4258,  
corey.ohern@yale.edu; seas.yale.edu/departments/mechanical-engineering-and-materials-science

FACULTY OF THE DEPARTMENT OF MECHANICAL ENGINEERING AND MATERIALS SCIENCE

**Professors** Charles Ahn, Ira Bernstein (*Emeritus*), Juan Fernández de la Mora, Alessandro Gomez, † Shun-Ichiro Karato, Marshall Long, † Brian Scassellati, Jan Schroers, Udo Schwarz (*Chair*), Mitchell Smooke

**Associate Professors** Aaron Dollar, Eric Dufresne, † Sohrab Ismail-Beigi, Corey O'Hern, Nicholas Ouellette

**Assistant Professors** Eric Brown, Judy Cha, Madhusudhan Venkadesan

**Lecturers** Ahmet Becene, Beth Anne Bennett, Kailasnath Purushothaman, Joseph Zinter

† A joint appointment with primary affiliation in another department or school.

Mechanical engineering is among the most diversified of the traditional engineering disciplines. The mechanical engineer builds machines to extend our physical and mental capabilities and to convert traditional and novel energy sources into useful forms.

The role of the mechanical engineer has changed dramatically over the past few decades with the extensive use of high-performance computers (in such areas as computational fluid dynamics design, data acquisition, control, and manufacturing), the interfacing of MEMS and actuators via microprocessors to measure and control (e.g., in flow control, robot control, and optimization of automobile performance), and the advent of new materials (composite, shape-memory alloy, ceramic, superconducting) for new applications (e.g., prosthetic devices, biomaterials, stealth aircraft). These areas offer mechanical engineering students special opportunities for creativity, demanding that they learn not only in depth but also in breadth. Demands for increased energy efficiency and reduced environmental impact – as might be realized, for example, in novel gas turbine or electric hybrid vehicles – require that students understand the fundamentals of mechanics, thermodynamics, fluid mechanics, combustion, and materials science. In all these tasks, the utmost consideration of the modern mechanical engineer is improving the quality of human life. The engineer must be constantly aware both of the finiteness of Earth's resources and its environment and of the burden that engineering works place on them.

The educational mission of the Department of Mechanical Engineering and Materials Science is to provide an excellent education that will prepare students to become members of the next generation of mechanical engineers. To implement this mission, the department adheres to the following set of educational objectives: to provide a balanced technical and nontechnical education to enable graduates to enter highly selective graduate schools and/or to pursue technical careers in industry or government laboratories; to enable graduates to improve and adapt their skills to accommodate rapid technological changes; to prepare graduates to communicate effectively and to understand the ethical responsibilities and impact on society of their profession. To achieve these objectives, the following fundamental educational goals have been established for the Department of Mechanical Engineering and Materials Science: to provide a comprehensive introduction to basic science and mathematics, which form the foundation of mechanical engineering; to provide thorough training in



methods of analytical, experimental, and data analysis, including problem formulation; to provide instruction in the fundamentals of the design process, including project innovation, synthesis, and management, both individually and in a team setting; to provide both a technical and a nontechnical program of study in which oral and written communication skills are developed; to instill in students an understanding of their professional and ethical responsibilities, which affect society and their profession.

At Yale, three mechanical engineering programs are offered: a B.S. degree program with a major in Mechanical Engineering, a B.S. degree program with a major in Engineering Sciences (Mechanical), and a B.A. degree program with a major in Engineering Sciences (Mechanical). Prospective majors in both B.S. programs are advised to complete introductory physics and mathematics through calculus (MATH 115) by the end of their freshman year.

A student's undergraduate engineering program usually culminates in one or more special project courses (MENG 471, 472), in which the student pursues a particular interest through design-oriented projects and experimental investigations. Projects may be initiated by the student, may be performed in a team, or may be derived from the ideas of faculty members who place undergraduates in their ongoing research projects. All interested students should contact the director of undergraduate studies, preferably no later than the beginning of the sophomore year.

**Credit/D/Fail** For the Class of 2017 and subsequent classes, no courses taken Credit/D/Fail may be counted toward the Mechanical Engineering major, including prerequisites.

**B.S. degree program in Mechanical Engineering** This is the most technically intensive mechanical engineering degree program and is accredited by the Engineering Accreditation Commission of ABET, Inc. This program is appropriate for students who plan careers as practicing engineers in industry, consulting firms, or government as well as for students who are considering a career in research and plan to pursue an advanced degree in engineering.

The prerequisites in mathematics are MATH 112, 115, and ENAS 151, or the equivalent. The basic science prerequisites are PHYS 200, 201, or 180, 181; one laboratory from PHYS 165L or 205L, and one from PHYS 166L or 206L, or equivalents.

Nineteen term courses beyond the prerequisites are required as follows:

1. Advanced mathematics: ENAS 194 and MATH 222 or 225
2. Mechanical engineering and related: MENG 211, 280, 285, 286L, 361, 363L, 383, 389, 390, 471 or 472 (the senior requirement), 489, ENAS 130, EENG 200, and at least one term course in chemistry (e.g., CHEM 112, 113, 114, 115, or 118)
3. Technical electives: Three approved technical electives chosen in consultation with the director of undergraduate studies.

The curriculum in this program is arranged in prescribed patterns, but some departures from it are possible with approval of the director of undergraduate studies.

**B.S. degree program in Engineering Sciences (Mechanical)** This non-ABET degree program is suitable for students who wish to gain significant expertise within

mechanical engineering while combining their engineering studies with related disciplines. For example, a number of students have taken courses in architecture while pursuing a program in mechanical engineering that emphasizes structural mechanics; similarly, a student with an interest in computer graphics might combine engineering courses in computer-aided design with programming courses from the Department of Computer Science. The major requires twelve approved term courses in engineering, which can cover a broad array of topics within the subject provided that they contribute to a coherent program. Students should consult with the director of undergraduate studies at the beginning of their sophomore year.

The prerequisites in mathematics are MATH 112, 115, and ENAS 151, or the equivalent. The basic science prerequisites are PHYS 180, 181, or 200, 201; one laboratory from PHYS 165L or 205L, and one from PHYS 166L, 206L, or MENG 286L.

The program requires twelve approved term courses beyond the prerequisites, including the senior project.

**B.A. degree program in Engineering Sciences (Mechanical)** In a society with increasing levels of technical sophistication, a well-rounded individual must have some background in science and technology. The non-ABET B.A. program is designed for students who may be planning careers in business, law, medicine, journalism, or politics but need to understand the impact that science and technology can have on society at large. An understanding of engineering methods and practices, combined with a traditional liberal arts education, provides a strong background for a variety of careers. The program is well suited for students who wish to fulfill the requirements of two majors.

The prerequisites in mathematics are MATH 112 and 115. The basic science prerequisite is physics at least to the level of PHYS 170, 171.

The program requires eight approved term courses beyond the prerequisites, including the senior project.

**Senior requirement** In all B.S. and B.A. degree programs, students must successfully complete a project (MENG 471 or 472) during their senior year.

**Courses for majors in the humanities and social sciences** Mechanics and mechanical engineering content can be found in several courses intended for those not majoring in science. See under Engineering and Applied Science (p. 273).

## REQUIREMENTS OF THE MAJOR

### MECHANICAL ENGINEERING, B.S.

**Prerequisites** MATH 112, 115, and ENAS 151, or equivalent; PHYS 200, 201, or 180, 181, and 2 labs (1 from PHYS 165L or 205L, and 1 from PHYS 166L or 206L, or equivalents)

**Number of courses** 19 term courses beyond prereqs (incl senior project)

**Specific courses required** ENAS 130 and 194; EENG 200; MATH 222 or 225; MENG 211, 280, 285, 286L, 361, 363L, 383, 389, 390, 489

**Distribution of courses** 3 technical electives chosen in consultation with DUS; 1 term course in chem

**Substitution permitted** With DUS approval

**Senior requirement** Senior project (MENG 471 or 472)

### ENGINEERING SCIENCES (MECHANICAL), B.S. AND B.A.

**Prerequisites** *B.S.* – MATH 112, 115, and ENAS 151, or equivalent; PHYS 180, 181, or 200, 201, and 2 labs (1 from PHYS 165L or 205L; 1 from PHYS 166L, 206L, or MENG 286L); *B.A.* – MATH 112, 115; PHYS 170, 171

**Number of courses** *B.S.* – 12 term courses beyond prereqs (incl senior project); *B.A.* – 8 term courses beyond prereqs (incl senior project)

**Substitution permitted** With DUS approval

**Senior requirement** *Both degrees* – senior project (MENG 471 or 472)

## Courses

### MENG 101b / ENAS 101b / ENVE 101b / EVST 105b, Energy, Engines, and Environment Alessandro Gomez

Energy sustainability and global warming; thermodynamic fundamentals; engines (combustion technologies, fossil-fuel pollution, carbon capture and sequestration). Wind, solar, biomass, and other renewable energy sources. Designed for freshmen and sophomores in science and engineering and for non-science majors. Prerequisite: A score of 4 or 5 on Advanced Placement examinations in mathematics and/or science.  
SC

### \* MENG 185a, Mechanical Design Staff

A course designed for potential majors in mechanical engineering, with units on design, materials science, structural mechanics, utilization of a machine shop, mechanical dissection, and computers in mechanical engineering. Includes a design project competition. Prerequisite: physics at the level of PHYS 180, or permission of instructor.  
SC RP

**MENG 211a, Thermodynamics for Mechanical Engineers** Alessandro Gomez  
Study of energy and its transformation and utilization. First and Second Laws for closed and open systems, equations of state, multicomponent nonreacting systems, auxiliary functions (H, A, G), and the chemical potential and conditions of equilibrium. Engineering devices such as power and refrigeration systems and their efficiencies. Prerequisites: PHYS 180 or 200, and MATH 115. QR, SC RP

### MENG 280a, Mechanical Engineering I: Strength and Deformation of Mechanical Elements Eric Dufresne

Elements of statics; mechanical behavior of materials; equilibrium equations, strains and displacements, and stress-strain relations. Elementary applications to trusses, bending of beams, pressure vessels, and torsion of bars. Prerequisites: PHYS 180 or 200, and MATH 115. QR, SC RP

### MENG 285a, Introduction to Materials Science Jan Schroers

Study of the atomic and microscopic origin of the properties of engineering materials: metals, glasses, polymers, ceramics, and composites. Phase diagrams; diffusion; rates of reaction; mechanisms of deformation, fracture, and strengthening; thermal and electrical conduction. Prerequisites: elementary calculus and background in basic mechanics (deformation, Hooke's law) and structure of atoms (orbitals, periodic table).  
QR, SC RP

**MENG 286La, Solid Mechanics and Materials Science Laboratory** Jan Schroers  
Experiments that involve either structural mechanics or materials science. Comparisons between structural theories and experimental results. Relationships among processing, microstructure, and properties in materials science. Introduction to techniques for the examination of the structure of materials. SC RP ½ Course cr

**MENG 361a, Mechanical Engineering II: Fluid Mechanics** Mitchell Smooke  
Mechanical properties of fluids, kinematics, Navier-Stokes equations, boundary conditions, hydrostatics, Euler's equations, Bernoulli's equation and applications, momentum theorems and control volume analysis, dimensional analysis and similitude, pipe flow, turbulence, concepts from boundary layer theory, elements of potential flow. Prerequisites: ENAS 194 or equivalent, and physics at least at the level of PHYS 180. QR, SC RP

\* **MENG 363La, Fluid Mechanics and Thermodynamics Laboratory** Eric Brown  
Hands-on experience in applying the principles of fluid mechanics and thermodynamics. Integration of experiment, theory, and simulation to reflect real-world phenomena. Students design and test prototype devices. Prerequisites: MENG 211 and 361. WR, SC RP

**MENG 365a, Propulsion and Energy Conversion** Ronald Lehrach  
Review of thermodynamics and fluid dynamics; discussion of elements of gas dynamics. Air-breathing engines for aircraft propulsion, gas turbines, and different forms of rocket propulsion. Engineering aspects of other forms of energy conversion with applications to one of the following areas: internal combustion engines, fossil-fuel power plants, solar energy. Prerequisite: MENG 361 or permission of instructor. QR, SC RP

**MENG 383a, Mechanical Engineering III: Dynamics** Udo Schwarz  
Kinematics and dynamics of particles and systems of particles. Relative motion; systems with constraints. Rigid body mechanics; gyroscopes. Prerequisites: PHYS 180 or 200, and MATH 120 or ENAS 151. QR, SC RP

**MENG 386b, Electronic, Optical, and Magnetic Properties of Materials**  
Jeeyoung Cha  
Introduction to quantum mechanics and the band theory of solids. Classification of metals, semiconductors, and insulators according to the band theory. Electronic, optical, and magnetic properties of solids; applications of these materials in electronic and optical devices. Prerequisite: MENG 285.

**MENG 389b, Mechanical Engineering IV: Fluid and Thermal Energy Science**  
Kailasnath Purushothaman  
Fundamentals of mechanical engineering applicable to the calculation of energy and power requirements, as well as transport of heat by conduction, convection, and radiation. Prerequisites: MENG 211, 361, and ENAS 194; or permission of instructor. QR, SC RP

**MENG 390a, Mechatronics Laboratory** Staff  
Hands-on synthesis of control systems, electrical engineering, and mechanical engineering. Review of Laplace transforms, transfer functions, software tools for solving ODEs. Review of electronic components and introduction to electronic instrumentation. Introduction to sensors; mechanical power transmission elements;

programming microcontrollers; PID control. Prerequisites: ENAS 194 or equivalent, ENAS 130, and EENG 200; or permission of instructor. QR RP

**MENG 400a, Computer-Aided Engineering** Marshall Long

Aspects of computer-aided design and manufacture (CAD/CAM). The computer's role in the mechanical design and manufacturing process; commercial tools for two- and three-dimensional drafting and assembly modeling; finite-element analysis software for modeling mechanical, thermal, and fluid systems. Prerequisite: ENAS 130 or permission of instructor. QR

**MENG 404a / BENG 404a, Medical Device Design and Innovation** Joseph Zinter

The engineering design, project planning, prototype creation, and fabrication processes for medical devices that improve patient conditions, experiences, and outcomes. Students develop viable solutions and professional-level working prototypes to address clinical needs identified by practicing physicians. Some attention to topics such as intellectual property, the history of medical devices, documentation and reporting, and regulatory affairs.

**MENG 440a / ENAS 440a, Applied Numerical Methods I** Beth Anne Bennett

The derivation, analysis, and implementation of various numerical methods. Topics include root-finding methods, numerical solution of systems of linear and nonlinear equations, eigenvalue/eigenvector approximation, polynomial-based interpolation, and numerical integration. Additional topics such as computational cost, error analysis, and convergence are studied in several contexts throughout the course. Prerequisites: MATH 115, and 222 or 225, or equivalents; ENAS 130 or some knowledge of MATLAB, C++, or Fortran programming. QR RP

**MENG 441b / ENAS 441b, Applied Numerical Methods II** Beth Anne Bennett

The derivation, analysis, and implementation of numerical methods for the solution of ordinary and partial differential equations, both linear and nonlinear. Additional topics such as computational cost, error estimation, and stability analysis are studied in several contexts throughout the course. Prerequisites: MATH 115, and 222 or 225, or equivalents; ENAS 130 or some knowledge of MATLAB, C++, or Fortran programming; ENAS 194 or equivalent. ENAS 440 is not a prerequisite. QR RP

**MENG 463a, Theoretical Fluid Dynamics** Juan Fernández de la Mora

Derivation of the equations of fluid motion from basic principles. Potential theory, viscous flow, flow with vorticity. Topics in hydrodynamics, gas dynamics, stability, and turbulence. Prerequisite: MENG 361 or equivalent. QR, SC RP

**\* MENG 471a and MENG 472b, Special Projects** Staff

Faculty-supervised individual or small-group projects with emphasis on research (laboratory or theory), engineering design (required for the ABET-accredited program), or tutorial study. Students are expected to consult the director of undergraduate studies and appropriate faculty members to discuss ideas and suggestions for topics. These courses may be taken at any time during the student's career when appropriate and may be taken more than once. Permission of adviser and director of undergraduate studies required.

**MENG 489a, Mechanical Design: Process and Implementation** Vincent Wilczynski

Study of the design process, including concept generation, project management, teamwork, detail design, and communication skills. Student teams implement a real-world design project with hardware objectives that can be achieved in a term, and a

problem definition that allows room for creative solutions. Prerequisite: MENG 280, 361, or permission of instructor. SC RP

\* **MENG 491b, Appropriate Technology and the Developing World** Joseph Zinter  
Introduction to user-centered design through exploration of appropriate technology, a class of solutions that solve a particular need and are viable and sustainable within the environmental, economic, cultural, and technological infrastructure for which they are intended. Focus on technologies for use in the developing world. Student design teams conceptualize, ideate, prototype, and generate a commercialization plan for a real-world appropriate technological device. RP

## Media Theory and History

Coordinator: Francesco Casetti, 53 Wall St., 432-0671, francesco.casetti@yale.edu

### FACULTY ASSOCIATED WITH MEDIA THEORY AND HISTORY

**Professors** Dudley Andrew (*Film Studies, Comparative Literature*), Jack Balkin (*Law School*), Rüdiger Campe (*German*), Francesco Casetti (*Humanities, Film Studies*), Aaron Gerow (*Film Studies, East Asian Languages & Literatures*), Inderpal Grewal (*Women's, Gender, & Sexuality Studies*), Beatrice Gruendler (*Near Eastern Languages & Civilizations*), Matthew Jacobson (*History, American Studies, African American Studies*), David Scott Kastan (*English*), Marianne LaFrance (*Psychology, Women's, Gender, & Sexuality Studies*), John MacKay (*Slavic Languages & Literatures, Film Studies*), Charles Musser (*American Studies, Film Studies, Theater Studies*), Robert Post (*Law School*), Henry Sussman (*German*) (*Visiting*), Katie Trumpener (*Comparative Literature, English*), Michael Warner (*English, American Studies*), Laura Wexler (*American Studies, Women's, Gender, & Sexuality Studies*)

**Associate Professors** Jessica Brantley (*English*), Gundula Kreuzer (*Music*), Karen Nakamura (*Anthropology, East Asian Studies*)

**Assistant Professors** J. D. Connor (*History of Art*), R. John Williams (*English*)

Media Theory and History examines the category of "media" as both an object and a method of study. This field of study considers media as historically constituted entities, as objects of theoretical and juridical debate, and as crucial elements of the messages they convey and the audiences they help to constitute. Media Theory and History bridges diverse disciplinary approaches, including literature, film, legal studies, history of art, sociology, anthropology, architecture, history of science, and computer science. It considers the social contexts and cultural effects of different media, including oral communication, written and printed texts, recorded and broadcast sound and image, and digital media.

Yale College does not have a department or a major in media studies. Media Theory and History serves as a network connecting faculty members whose interests in research and teaching intersect around the subject of media. The faculty members listed above have made themselves available to advise students interested in approaching media from various disciplinary perspectives. Advisers help students identify appropriate sequences and combinations of courses, and meet with students about senior essays on interdisciplinary topics in media studies.

# Modern Middle East Studies

Director of undergraduate studies: Andrew March, 135 RKZ, 432-4178,  
andrew.march@yale.edu; www.yale.edu/macmillan/cmcs

## FACULTY ASSOCIATED WITH THE PROGRAM OF MODERN MIDDLE EAST STUDIES

**Professors** Abbas Amanat (*History*), Gerhard Böwering (*Religious Studies*), John Darnell (*Near Eastern Languages & Civilizations*), Stephen Davis (*Religious Studies*), Steven Fraade (*Religious Studies*), Eckart Frahm (*Near Eastern Languages & Civilizations*), Frank Griffel (*Religious Studies*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Christine Hayes (*Religious Studies*), Hannan Hever (*Comparative Literature*), Marcia Inhorn (*Anthropology*), Anthony Kronman (*Law School*), Bentley Layton (*Religious Studies*), Ellen Lust (*Political Science*), Joseph Manning (*Classics, History*), Ivan Marcus (*History*), Alan Mikhail (*History*), Robert Nelson (*History of Art*), W. Michael Reisman (*Law School*), Maurice Samuels (*French*), Lamin Sanneh (*Divinity School*), Harvey Weiss (*Near Eastern Languages & Civilizations*)

**Associate Professors** Zareena Grewal (*American Studies*), Kaveh Khoshnood (*Public Health*), Colleen Manassa (*Near Eastern Languages & Civilizations*), Andrew March (*Political Science*), A. Mushfiq Mobarak (*School of Management*), Kishwar Rizvi (*History of Art*), Eliyahu Stern (*Religious Studies*)

**Assistant Professors** Rosie Bsheer (*History*), Robyn Creswell (*Comparative Literature*), Narges Erami (*Anthropology*), Adria Lawrence (*Political Science*), Mark Lazenby (*School of Nursing*), Jonathan Wyrzten (*Sociology*)

**Senior Lecturers** Geetanjali Singh Chanda (*Women's, Gender, & Sexuality Studies*), Tolga Koker (*Economics*), Kathryn Slanski (*Near Eastern Languages & Civilizations*)

**Lecturers** Adel Allouche (*History*), Karla Britton (*Architecture*), Karen Foster (*History of Art*), Eric Van Lit (*Council on Middle East Studies*)

**Senior Lecturer II** Ayala Dvoretzky

**Senior Lectors** Sarab al-Ani, Muhammad Aziz, Aaron Butts, Youness Elbousty, Shiri Goren, Dina Roginsky, Farkhondeh Shayesteh

**Lector** Etem Erol

The Modern Middle East Studies major focuses on the culture, history, religion, politics, and society of the modern Middle East in its full geographical breadth, using any of its four major languages, Arabic, Hebrew, Persian, and Turkish. Courses are selected from the Department of Near Eastern Languages and Civilizations and from other departments in the humanities and social sciences, including Anthropology, History, History of Art, Judaic Studies, Political Science, and Religious Studies. The Modern Middle East Studies major gives students the language skills necessary to understand complex issues of the Middle East and serves as excellent preparation for graduate study or for business and professional careers in which an understanding of that region is essential.

**Prerequisites** There are no prerequisites, but prospective majors should keep the language requirement in mind while planning their course schedules (see below).

**Requirements of the major** Twelve term courses are required for the major, including three foundational courses, one each in modern thought, classical thought, and the modern Middle East. Six electives on the modern Middle East examine culture and thought, history, religion, politics, and society. Elective courses must be spread geographically and substantively; they must focus on at least two different subregions and originate in at least two different departments. The proposed course of study requires the approval of the director of undergraduate studies.

**Language requirement** All students are required to complete two courses at the L5 level in a Middle Eastern language. The two courses may be applied toward the twelve-course major requirement. Typical courses include ARBC 150, 151, and PERS 150.

**Senior requirement** Students in the major undertake a one- or two-term senior essay that involves use of materials in one or more modern Middle Eastern languages. The student selects a faculty adviser with competence in an appropriate language. A prospectus and outline signed by the adviser must be submitted to the director of undergraduate studies by the end of the fourth week of classes in either term of the senior year. Senior essays are graded by the adviser and a second reader. See the course descriptions of the senior essay courses (MMES 491, 492, 493) for additional information. Alternatively, majors may take an additional seminar and write an essay in that course to fulfill the senior requirement.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 term courses

**Distribution of courses** 3 foundational courses, 1 each in modern thought, classical thought, and the modern Middle East; 6 electives spread geographically and substantively, focusing on at least 2 subregions and from at least 2 depts

**Language requirement** 2 courses at L5 level in a Middle Eastern lang

**Senior requirement** Senior essay (MMES 491 or MMES 492, 493) or essay written in an addtl sem

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## Foundational Courses

### MODERN THOUGHT

**MMES 290a / PLSC 435a / RLST 290a, Islam Today: Jihad and Fundamentalism**

Frank Griffel

Introduction to modern Islam, including some historical background. Case studies of important countries in the contemporary Muslim world, such as Egypt, Iran, Pakistan, and Saudi Arabia. Islam as a reactive force to Western colonialism; the ideals of Shari'a and jihad; violence and self-sacrifice; and Islam as a political ideology. HU

### CLASSICAL THOUGHT

\* **MMES 342a / HIST 232Ja / HUMS 443a / JDST 270a / RLST 201a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural



grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

#### THE MODERN MIDDLE EAST

**\* MMES 181b / AFST 389b / GBLB 186b / PLSC 389b, Middle East Exceptionalism**

Adria Lawrence

The Middle East and North Africa in comparative perspective. Evaluation of claims that the region's states are exceptionally violent, authoritarian, or religious. Themes include gender, Islam, nation and state formation, oil wealth, terrorism, and war. SO

**\* MMES 343a / EP&E 273a / RLST 291a / SOCY 343a, Sociology of Islam**

Jonathan Wyrzten

Social scientific studies of Islam; introduction to sociology of religion and its application to Islam; the utility of "Islam" and "Muslim" as analytical categories; debates about definitions of Islam and religion in anthropology and religious studies; comparative sociological studies both within Islam and contrasting Islam with other religions. SO

### Elective Courses

**\* MMES 147a / HIST 347Ja, The Ottoman Empire** Alan Mikhail

Major trends in Ottoman history and historiography. The political and imperial history of the ruling Ottoman elite; the culture, politics, and realities of marginal groups such as peasants, women, and minorities. The complex web of relationships between the state and its bureaucrats, peasants, judges, families, and merchants. WR, HU

**MMES 148b / HIST 345b / JDST 265b / RLST 202b, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries** Ivan Marcus

Jewish culture and society in Muslim lands from the Prophet Muhammad to Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU RP

**MMES 149a / ER&M 219a / HIST 219a / JDST 200a / RLST 148a, History of the Jews and Their Diasporas to Early Modern Times** Ivan Marcus

A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings. Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP

**\* MMES 150b / HEBR 150b / JDST 213b, Advanced Modern Hebrew: Israeli Society** Shiri Goren

An examination of major controversies in Israeli society. Readings include newspaper editorials and academic articles as well as documentary and historical material. Advanced grammatical structures are introduced and practiced. Conducted in Hebrew. Prerequisite: HEBR 140 or equivalent. L5 RP

\* **MMES 155a / HEBR 160a / JDST 360a, Hebrew in a Changing World**

Dina Roginsky

Sociological aspects of Modern Hebrew as the language is used in Israel to construct norms, expectations, and daily experiences. Readings and class discussions address changes in Israeli society and culture at large. Prerequisite: HEBR 140. L5

\* **MMES 159a / HEBR 159a / JDST 409a, Conversational Hebrew: Israeli Media**

Shiri Goren

An advanced Hebrew course for students interested in practicing and enhancing conversational skills. Focus on listening comprehension and on various forms of discussion, including practical situations, online interactions, and content analysis. Prerequisite: HEBR 140 or permission of instructor. L5 RP

**MMES 160a / JDST 323a / NELC 155a, State and Society in Israel** Dina Roginsky

The interplay between the state and society in Israel. Current Israeli discourse on controversial issues such as civil rights in a Jewish-democratic state, Jewish-Arab relations, and right and left politics. Issues of orthodoxy, military service, globalization, and multiculturalism in Israel. Sociopolitical changes that have taken place in Israel since the establishment of the state in 1948 and that have led to the reshaping of Israeli Zionist ideology. HU

\* **MMES 172b / HIST 384Jb / NELC 403b, The Middle East between Crusaders and Mongols** Adel Allouche

The impact of the Crusades and the Mongol conquests on the Islamic Middle East. Political, social, and economic changes in the region from the eleventh century to the middle of the fourteenth. Emphasis on the rise of new dynasties as a result of changes in the ethnic mosaic of the Middle East. WR, HU

\* **MMES 173b / HIST 398Jb / NELC 404b, Mamluk Egypt** Adel Allouche

A study of the Mamluks, manumitted slaves initially imported to Egypt for military service who established their own rule over Egypt and Syria (1250–1517). Focus on the structure and workings of the Mamluk state. Military, political, economic, and social factors that contributed to the grandeur and, later, the decline of the Mamluk period in Egypt and its conquest by the Ottoman Turks. WR, HU

**MMES 197a / JDST 332a / RLST 193a, Zionism** Eliyahu Stern

Introduction to the core ideas of the Zionist movement from the mid-nineteenth century to the mid-twentieth. Focus on internal Jewish debates and criticism of the movement by European and Middle Eastern intellectuals. Social, political, cultural, and messianic ideological strands within the movement and their interpretations of various historical experiences and ideas located in the Jewish tradition. HU

\* **MMES 282b / AFST 373b / GBL 362b / SOCY 339b, Imperialism, Insurgency, and State Building in the Middle East and North Africa** Jonathan Wyrzten

The historical evolution of political order from Morocco to Central Asia in the past two centuries. Focus on relationships between imperialism, insurgency, and state building. Ottoman, European, and nationalist strategies for state building; modes of local resistance; recent transnational developments; American counterinsurgency and nation-building initiatives in the region. SO

\* **MMES 291b / AFST 348b / SOCY 232b, Islamic Social Movements**

Jonathan Wyrzten

Social movement and network theory used to analyze the emergence and evolution of Islamic movements from the early twentieth century to the present. Organization, mobilization, and framing of political, nonpolitical, militant, and nonmilitant movements; transnational dimensions of Islamic activism. Case studies include the Muslim Brotherhood, Hamas, Hizbollah, Al-Qaeda, Al-Adl wa-Ihsann, and Tablighi Jama'at. SO

\* **MMES 293b / RLST 199b, Sufism and Ethics in the Works of al-Ghazali** Staff

Close reading of selections from al-Ghazali's writings on Sufism, the mystical tradition in Islam, with a focus on his *Revival of the Religious Sciences*. Ways in which Sufism can be lived in the daily lives of Muslims; its relations with philosophy and theology; the role of Sufism in creating a Muslim ethic. HU

\* **MMES 311a / ER&M 327a / WGSS 327a, Constructing the Self: From Autobiography to Facebook** Geetanjali Chanda

Autobiography in its evolving form as literary genre, historical archive, and individual and community narrative in a changing geographical context. Women's life stories from Afghanistan, China, Cambodia, Indonesia, India, Iran, Egypt, Jordan, and Vietnam illustrate the dialectic relationship between the global and the local. What the reading and writing of autobiographies reveal about oneself and one's place in society; autobiography as a horizontal community formation. WR, HU

\* **MMES 401a / AFST 343a, Postcolonialism in Africa and the Middle East** Staff

Examination of the major narrative and political preoccupations of postcolonial literature from Africa, the Middle East, and the diaspora. Focus on language, identity, gender, nationalism, colonialism, and migration. Authors include Equiano, Achebe, Dangarembga, Mernissi, Choukri, Hamidou Kane, and Fanon. WR, HU

\* **MMES 412a / ANTH 431a, Anthropology of Handmade Commodities**

Narges Erami

The art of making things, with a focus on the recent popularity of handcrafted goods from around the world. Theories on modernity and technology, movement and action, and aesthetics. The practice of making Persian carpets, including their history, color and design, and relation to Islamic art. HU, SO

\* **MMES 465a or b / ARBC 165a or b, Arabic Seminar** Dimitri Gutas

Study and interpretation of classical Arabic texts for advanced students. Prerequisite: ARBC 146, 151, or permission of instructor. May be repeated for credit. L5

## Directed Study and Senior Essay Courses

\* **MMES 471a and MMES 472b, Independent Directed Study** Andrew March

Independent research or directed reading under the direction of a faculty member in the program on a special topic in Modern Middle East Studies not substantially covered by an existing undergraduate or graduate course. A proposal describing the nature of the program and the readings to be covered must be signed by the adviser and submitted to the director of undergraduate studies by the end of the second week of classes. The student should meet with the adviser regularly, typically for an hour a week, and write one term essay or several short essays.

**\* MMES 491a or b, Senior Essay** Andrew March

The one-term senior essay is a research paper of at least thirty pages prepared under the supervision of a faculty member in accordance with the following schedule: (1) by the end of the second week of classes of the term, students meet with advisers to discuss the essay's topic, approach, sources, and bibliography; (2) by the end of the fourth week of classes a prospectus with outline, including an annotated bibliography of materials in one or more modern Middle Eastern languages and of secondary sources, is signed by the adviser and submitted to the director of undergraduate studies. The prospectus should indicate the formal title, scope, and focus of the essay, as well as the proposed research method, including detailed indications of the nature and extent of materials in a modern Middle Eastern language that will be used; (3) at the end of the tenth week of classes, a rough draft of the complete essay is submitted to the adviser; (4) by 4 p.m. on the last day of reading period, two copies of the finished paper must be submitted to the MMES registrar, 115 Prospect St., room 344. A late essay will receive a lower grade. Senior essays are graded by faculty associated with the Modern Middle East Studies program unless, for exceptional reasons, different arrangements for another reader have been made in advance with the director of undergraduate studies and the faculty adviser.

**MMES 492a and MMES 493b, The Yearlong Senior Essay** Staff

The yearlong senior essay is a research paper of at least sixty pages prepared under the supervision of a faculty member in accordance with the following schedule: (1) by the end of the second week of classes of the first term, students meet with advisers to discuss the essay's topic, approach, sources, and bibliography; (2) by the end of the fourth week of classes a prospectus with outline, including an annotated bibliography of materials in one or more modern Middle Eastern languages and of secondary sources, is signed by the adviser and submitted to the director of undergraduate studies. The prospectus should indicate the formal title, scope, and focus of the essay, as well as the proposed research method, including detailed indications of the nature and extent of materials in a modern Middle Eastern language that will be used; (3) at the end of February, a rough draft of the complete essay is submitted to the adviser; (4) by 4 p.m. on the last day of reading period in the spring term, two copies of the finished paper must be submitted to the MMES registrar, 115 Prospect St., room 344. A late essay will receive a lower grade. Senior essays are graded by faculty associated with the Modern Middle East Studies program unless, for exceptional reasons, different arrangements for another reader have been made in advance with the director of undergraduate studies and the faculty adviser. Credit for MMES 492 only on completion of MMES 493.

## Molecular Biophysics and Biochemistry

Director of undergraduate studies: Michael Koelle, CE 28A SHM, 737-5808, [madeline.cavanaugh@yale.edu](mailto:madeline.cavanaugh@yale.edu); [medicine.yale.edu/mbb/academicprograms/undergraduate](http://medicine.yale.edu/mbb/academicprograms/undergraduate)

FACULTY OF THE DEPARTMENT OF MOLECULAR BIOPHYSICS AND BIOCHEMISTRY

**Professors** † Karen Anderson, Susan Baserga, † Ronald Breaker, † Gary Brudvig, † Donald Crothers (*Emeritus*), Enrique De La Cruz, † Daniel DiMaio, Donald

Engelman, Alan Garen, Mark Gerstein, Mark Hochstrasser, Joe Howard, Anthony Koleske, William Konigsberg, † Patrick Loria, † I. George Miller, Andrew Miranker, † Peter Moore (*Emeritus*), Karla Neugebauer, † Thomas Pollard, Lynne Regan, † David Schatz, Dieter Söll, Mark Solomon, Joan Steitz, Thomas Steitz, Scott Strobel, † William Summers, Patrick Sung, Kenneth Williams (*Adjunct*), † Sandra Wolin

**Associate Professors** Michael Koelle, A. Elizabeth Rhoades, Yong Xiong

**Assistant Professors** † Richard Baxter, Julien Berro, Christian Schlieker, Matthew Simon, Chuck Sindelar, † Corey Wilson

**Lecturers** † Sandy Chang, Aruna Pawashe

† A joint appointment with primary affiliation in another department.

The programs offered by the Department of Molecular Biophysics and Biochemistry are planned for students interested in the molecular and chemical basis of biological processes and are well suited to students hoping to attend medical school or pursue graduate studies in biochemistry, molecular biology, genetics, or biophysics. The B.S. major, designed for those with a strong commitment to research, provides an intensive introduction to laboratory techniques in biochemistry and biophysics. Students in this program usually carry out research projects in faculty laboratories during their junior and senior years. The B.A. major provides the intellectual discipline of biochemistry and biophysics for students who also wish to have sufficient time to pursue in-depth studies outside the major or who are interested in molecular biology as a liberal education; they, too, may engage in research during their junior and senior years.

**Basic science prerequisites for the Class of 2016 and subsequent classes** The basic science courses required of all majors include four half-term units of introductory biology (BIOL 101, 102, 103, 104); a general chemistry course with laboratory (CHEM 112, 113, or 114, 115, and 116L, 117L; or 118 and 119L); a year course in organic chemistry with laboratory (CHEM 124, 125, or 220, 230, and 222L, 223L); one term of physical chemistry (CHEM 328); two terms of calculus (MATH 112 and 115); and one year of physics (PHYS 170, 171, or 180, 181, or 200, 201). The B.A. major also requires one term of biology laboratory (MCDB 121L, 221L, E&EB 123L, or 223L). Some of the prerequisites in biology, chemistry, mathematics, and physics may be satisfied by scores on Advanced Placement tests or placement examinations sufficient to earn acceleration credits in the particular subjects, even if the student does not choose to accelerate.

**B.S. degree for the Class of 2016 and subsequent classes** Nine courses are required beyond the prerequisites: MB&B 300, 301, 302, 360L, and 490; two additional upper-level MB&B electives, one of which must be a lecture course; one quantitative reasoning elective (e.g., MATH 120 or above, STAT 105 or 230 or above, CPSC 201 or above, or ENAS 130 or above); and one elective in the natural sciences at a level higher than required in the prerequisites. Students choose the elective courses in consultation with a faculty adviser (see below). Only two course credits of MB&B 470, 471, and 478, 479 may count toward these electives. Students may substitute CHEM 333 for MB&B 302. The quantitative reasoning requirement may not be fulfilled by Advanced Placement test scores.

**B.A. degree for the Class of 2016 and subsequent classes** Seven courses are required beyond the prerequisites: MB&B 251L, 300, 301, 302, and 490; one additional upper-

level MB&B elective; and one quantitative reasoning elective (e.g., MATH 120 or above, STAT 105 or 230 or above, CPSC 201 or above, or ENAS 130 or above). Students choose the elective courses in consultation with a faculty adviser (see below). Students may substitute CHEM 333 for MB&B 302. The quantitative reasoning requirement may not be fulfilled by Advanced Placement test scores.

**Senior requirement** The senior requirement for both the B.S. and the B.A. is fulfilled by successful completion of MB&B 490, The Senior Project. Students enrolled in this course prepare a written report and make an oral presentation of a literature project. Students meet with faculty members in charge of the colloquium during the first two weeks of the spring term to agree on a topic and an approach. It is appropriate for students who took research for credit earlier in their training to write on their research topic. It is inappropriate for students to submit a revised version of a past research report or to resubmit a literature paper prepared for another course. The literature project for the senior requirement should be original work approved by the faculty member overseeing the senior colloquium.

The written report is expected to be 15–25 pages in length (double-spaced, twelve-point font exclusive of figures). A first draft of the paper is due two weeks prior to the date of the oral presentation. Faculty in charge of the program will review the draft and return it to the student with suggestions. A final draft of the paper is due the first day of the reading period in the student's final term.

Students make a fifteen-minute oral presentation during the last three weeks of their final term in a general scientific forum open to the public. Other students in the series are expected to attend all presentations.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

**The major for the Class of 2015** Students who took or placed out of either MCDB 120 or E&EB 122 are not required to take BIOL 101, 102, 103, or 104. Students who did not take or place out of MCDB 120 or E&EB 122 must either take or place out of at least two of the four introductory biology modules, BIOL 101, 102, 103, 104. Beyond the prerequisites, the requirements for the major are the same as those for the Class of 2016, except that the B.S. degree requires one additional biology elective at the 200 level or higher.

**Recommended courses for all classes** All B.S. majors are encouraged to include MB&B 470 or 471 among their MB&B electives. The prerequisites in either general or organic chemistry should be taken in the freshman year.

Students with a strong interest in biophysics, including those planning to attend graduate school, are strongly encouraged to take courses beyond the basic requirements of the major. Such students are advised to take mathematics through differential equations (ENAS 194, MATH 246, or PHYS 301) and a full year of physical chemistry (CHEM 328 or 332, and 333). In place of one term of biophysics (MB&B 302) they may elect a full year of upper-level biophysics (MB&B 420 and graduate courses in optical spectroscopy and macromolecular interactions). Such revisions to the basic curriculum must be made in consultation with the faculty adviser.

Graduate courses in molecular biophysics and biochemistry, biology, and the biomedical sciences that may be of interest to undergraduates are listed in the bulletin of the Graduate School (<http://www.yale.edu/printer/bulletin/htmlfiles/grad>), and many are posted on the Biological and Biomedical Sciences Web site (<http://bbs.yale.edu>). Additional information is available from the directors of undergraduate and graduate studies. Undergraduates with an appropriate background may enroll with the permission of the director of graduate studies and the instructor.

**Typical programs** Programs with the minimal number of science courses required of B.A. and B.S. majors are shown below. Students whose scores on the Advanced Placement tests make them eligible for advanced courses are urged to replace the elementary science courses with more advanced ones in their freshman year, and to complete the required biochemistry and physics courses by the end of their sophomore and junior years, respectively. Students are permitted to take the biochemistry sequence (MB&B 300, 301) after one term of organic chemistry (CHEM 220).

Freshman	Sophomore	Junior	Senior
BIOL 101, 102, 103, 104	CHEM 220, 230, 222L, 223L	MB&B 300, 301	CHEM 328
CHEM 112, 113, 116L, 117L	MATH 112, 115 And, for B.A. major: MCDB 221L or E&EB 223L	One quantitative reasoning elective PHYS 180, 181 And, for B.A. major: MB&B 251L And, for B.S. major: MB&B 360L	MB&B 302 One MB&B elective MB&B 490 And, for B.S. major: One science elective and a second MB&B elective

**Combined B.S./M.S. degree program** Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. See "Simultaneous Award of the Bachelor's and Master's Degrees" under Special Arrangements (p. 63) in the Academic Regulations. Interested students should consult the director of undergraduate studies prior to the sixth term of enrollment for specific requirements in Molecular Biophysics and Biochemistry.

**MB&B Faculty Committee on the Undergraduate Major** Committee members are available for consultation throughout the year and are the only faculty advisers eligible to approve and sign MB&B majors' course schedules at the beginning of each term. Members acting as faculty advisers are:

*Class of 2015:*

P. Sung, C 130A SHM (785-4553)

J. Steitz, 136E BCMM (737-4418)

*Class of 2016:*

M. Hochstrasser, 224 BASS (432-5101)

W. Konigsberg, CE 14A SHM (785-4599)

*Class of 2017:*

L. Regan, 322 BASS (432-9843)

M. Simon, 220 BASS (432-5158)

*Class of 2018:*

K. Neugebauer, C 123 SHM (785-3322)

C. Schlieker, 236A BASS (432-5035)

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** *All classes*—CHEM 112, 113, or 114, 115, and 116L, 117L (or 118, 119L); CHEM 124, 125, or 220, 230, and 222L, 223L; CHEM 328; MATH 112, 115; PHYS 170, 171, or 180, 181, or 200, 201; *Class of 2016 and subsequent classes*—B.S.—BIOL 101, 102, 103, 104; B.A.—BIOL 101, 102, 103, 104; MCDB 121L, 221L, E&EB 123L, or 223L; *Class of 2015*—B.S.—MCDB 120 or E&EB 122; B.A.—MCDB 120 or E&EB 122; MCDB 121L or E&EB 123L

**Number of courses** *Class of 2016 and subsequent classes*—B.S.—9 term courses beyond prereqs, incl senior req; B.A.—7 term courses beyond prereqs, incl senior req; *Class of 2015*—B.S.—10 term courses beyond prereqs, incl senior req; B.A.—7 term courses beyond prereqs, incl senior req

**Specific courses required** *All classes*—B.S.—MB&B 300, 301, 302, 360L; B.A.—MB&B 251L, 300, 301, 302

**Distribution of courses** *All classes*—B.S.—2 addtl MB&B electives, 1 quantitative reasoning elective, and 1 science elective, all as specified; B.A.—1 addtl MB&B elective and 1 quantitative reasoning elective, as specified; *Class of 2015*—B.S.—1 addtl biology elective at 200 level or higher

**Substitution permitted** CHEM 333 for MB&B 302

**Senior requirement** Senior project (MB&B 490)

## Courses

### \* MB&B 050a, Topics in Cancer Biology Sandy Chang

Introduction to cancer as a genetic disease, with a focus on major discoveries in cancer biology that offer mechanistic insights into the disease process. A brief history of cancer; influence of the genomic revolution on cancer diagnostics; molecular defects underlying specific cancers; current and future cancer therapeutics. Patient case studies highlight specific molecular pathways and treatment strategies. Enrollment limited to freshmen with a strong background in biology and/or chemistry, typically demonstrated by a score of 4 or 5 on Advanced Placement examinations. Preregistration required; see under Freshman Seminar Program. SC

### MB&B 105a or b / MCDB 105a or b, An Issues Approach to Biology Staff

Biological concepts taught in context of current societal issues, such as stem cell research and genetically modified organisms. Emphasis on biological literacy to enable students to evaluate scientific arguments. SC

### \* MB&B 110a, Current Issues in Biological Science William Summers

Students identify a scientific problem and then plan and execute a program of individualized learning aimed at the particular scientific knowledge required to understand and analyze the chosen problem. Intended to help students develop self-education skills as applied to scientific understanding, apply those skills to acquire



some specific scientific knowledge, and understand the process by which scientific knowledge and understanding are achieved. For non–science majors. SC

**\* MB&B 200a or b / MCDB 300a or b, Biochemistry** Staff

An introduction to the biochemistry of animals, plants, and microorganisms, emphasizing the relations of chemical principles and structure to the evolution and regulation of living systems. Prerequisites: BIOL 101 or equivalent performance on the corresponding biological sciences placement examination; one term of organic chemistry; or with permission of instructor. SC

**\* MB&B 218La / HSAR 218La, Art and Biomolecular Recognition Laboratory**

Andrew Miranker

Students create and execute original projects in materials science using biotechnological tools. Introduction to the technical examination of art, with analysis of works from Yale University Art Gallery collections; the chemical basis of artist's materials; applied techniques in biomolecular evolution. Enrollment limited. Preference to students with a strong high-school background or college-level course work in chemistry and/or biology. SC

**\* MB&B 251La / MCDB 301La, Laboratory for Biochemistry** William Konigsberg

An introduction to current experimental methods in molecular biology. After or concurrently with MB&B 200 or 300. Limited enrollment. Requires preregistration by e-mail to Aruna Pawashe and William Konigsberg prior to the first week of classes. SC  
½ Course cr

**MB&B 300a, Principles of Biochemistry I** Michael Koelle

Discussion of the physical, structural, and functional properties of proteins, lipids, and carbohydrates, three major classes of molecules in living organisms. Energy metabolism, hormone signaling, and muscle contraction as examples of complex biological processes whose underlying mechanisms can be understood by identifying and analyzing the molecules responsible for these phenomena. After BIOL 101; after or concurrently with CHEM 125 or 220 SC

**MB&B 301b, Principles of Biochemistry II**

Christian Schlieker, Joan Steitz, and Karla Neugebauer

A continuation of MB&B 300 that considers the chemistry and metabolism of nucleic acids, the mechanism and regulation of protein and nucleic acid synthesis, and selected topics in macromolecular biochemistry. Prerequisite: MB&B 300 or permission of instructor. SC

**MB&B 302b, Principles of Biophysics** Enrique De La Cruz and Charles Sindelar

An introduction to the theoretical basis of biophysical concepts and approaches with selected examples and applications. Prerequisites: MB&B 300 and CHEM 328. SC

**\* MB&B 360Lb, Laboratory for Biochemistry and Biophysics**

Alan Garen, William Konigsberg, and Aruna Pawashe

An intensive introduction to the principles and applications of experimental techniques currently used in biochemistry, biophysics, and molecular biology. Recommended to be taken with or directly after MB&B 301. Limited enrollment. Preregistration required during the first week of November using a sign-up sheet outside 157 OML. SC

**MB&B 420a, Macromolecular Structure and Biophysical Analysis**

Andrew Miranker, Jonathon Howard, and Yong Xiong

Analysis of macromolecular architecture and its elucidation using modern methods of structural biology and biochemistry. Topics include architectural arrangements of proteins, RNA, and DNA; practical methods in structural analysis; and an introduction to diffraction and NMR. Prerequisites: MB&B 301 and 302. SC

**MB&B 425a / MCDB 425a, Basic Concepts of Genetic Analysis** Tian Xu

The universal principles of genetic analysis in eukaryotes. Reading and analysis of primary papers that illustrate the best of genetic analysis in the study of various biological issues. Focus on the concepts and logic underlying modern genetic analysis. Prerequisite: MCDB 200 or equivalent. SC

**MB&B 435a, Mathematical Methods in Biophysics** Anna Rhoades and Staff

Applied mathematical methods relevant to analysis and interpretation of biophysical and biochemical data. Statistics and error analysis, differential equations, linear algebra, and Fourier transforms. Analysis of real data from research groups in MB&B. Prerequisites: MATH 120 and MB&B 300 or equivalents, or with permission of instructors. QR, SC

**MB&B 443b, Advanced Eukaryotic Molecular Biology** Mark Hochstrasser and Staff

Selected topics in regulation of chromatin structure and remodeling, mRNA processing, mRNA stability, translation, protein degradation, DNA replication, DNA repair, site-specific DNA recombination, and somatic hypermutation. Prerequisites: MB&B 300 and 301, or permission of instructor. SC RP

**\* MB&B 445b, Methods and Logic in Molecular Biology**

Mark Hochstrasser, Dieter Söll, Julien Berro, and Jonathon Howard

An examination of fundamental concepts in molecular biology through analysis of landmark papers. Development of skills in reading the primary scientific literature and in critical thinking. Prerequisites: MB&B 300 and 301. SC RP

**MB&B 449a, Medical Impact of Basic Science** Joan Steitz and Staff

Examples of recent discoveries in basic science that have elucidated the molecular origins of disease or that have suggested new therapies for disease. Readings from the primary scientific and medical literature, with emphasis on developing the ability to read this literature critically. Prerequisites: MB&B 300 and 301 or equivalents, or permission of instructor. SC

**MB&B 452b / MCDB 452b, Bioinformatics: Practical Application of Simulation and Data Mining** Mark Gerstein

Techniques in data mining and simulation applied to bioinformatics, the computational analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. Sequence alignment, comparative genomics and phylogenetics, biological databases, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, microarray normalization, and machine-learning approaches to data integration. Prerequisites: MB&B 301 and MATH 115, or permission of instructor. SC

**\* MB&B 470a and MB&B 471b, Research in Biochemistry and Biophysics**

Alan Garen

Individual laboratory projects under the supervision of a faculty member. Students must submit an enrollment form that specifies the research supervisor by the date

that course schedules are due. A required organizational meeting will be held at the beginning of each term. Students are expected to commit at least ten hours per week to working in a laboratory. Written assignments include a research proposal, due near the beginning of the term, and a research report that summarizes experimental results, due before the beginning of the final examination period. No more than two course credits count as electives toward the B.S. degree. Enrollment limited to junior and senior MB&B majors. Prerequisite: MB&B 251L or 360L.

\* **MB&B 478a and MB&B 479b, Intensive Research in Biochemistry and Biophysics**

Alan Garen

Individual laboratory projects under the supervision of a faculty member. Students must submit an enrollment form that specifies the research supervisor by the day that course schedules are due. A required organizational meeting will be held at the beginning of each term. Students are expected to commit at least twenty hours per week to working in a laboratory. Written assignments include a research proposal, due near the beginning of the term, and a research report that summarizes experimental results, due before the beginning of the final examination period. No more than two course credits count as electives toward the B.S. degree. Enrollment limited to senior MB&B majors. Prerequisite: MB&B 251L or 360L. 2 Course cr per term

\* **MB&B 490b, The Senior Project**

William Konigsberg, Karla Neugebauer, Scott Strobel, and Patrick Sung  
Colloquium for fulfillment of the senior requirement. The course involves a written and an oral presentation of a senior paper in an area of biochemistry or biophysics. The topic is selected in consultation with the faculty members in charge of the course.

## Molecular, Cellular, and Developmental Biology

Director of undergraduate studies: Douglas Kankel, 1220B KBT, 432-3839,  
crystal.adamchek@yale.edu; www.mcdb.yale.edu

### FACULTY OF THE DEPARTMENT OF MOLECULAR, CELLULAR, AND DEVELOPMENTAL BIOLOGY

**Professors** Sidney Altman, Robert Bazell (*Adjunct*), Ronald Breaker, John Carlson, † Lynn Cooley, Craig Crews, Stephen Dellaporta, Xing-Wang Deng, Paul Forscher, Jo Handelsman, † Mark Hochstrasser, Vivian Irish, Christine Jacobs-Wagner, Douglas Kankel, † Paula Kavathas, Haig Keshishian, Mark Mooseker, † Jon Stanley Morrow, Thomas Pollard, Anna Pyle, Joel Rosenbaum, † Hugh Taylor, Robert Wyman

**Associate Professors** Thierry Emonet, Martín García-Castro, Scott Holley, Valerie Horsley, † Akiko Iwasaki, Weimin Zhong

**Assistant Professors** Murat Acar, Shirin Bahmanyar, † Sreeganga Chandra, Damon Clark, Nicole Clay, Joshua Gendron, Farren Isaacs, † Kathryn Miller-Jensen, † Matthew Rodeheffer

**Lecturers** † Alexia Belperron, Brett Berke, Surjit Chandhoke, Iain Dawson, Kathryn Gardner, Mary Klein, † Kaury Kucera, † William Leiserson, Maria Moreno, Kenneth Nelson, † William Segraves, Tiffany Tsang, Joseph Wolenski

† A joint appointment with primary affiliation in another department or school.

The science of biology is extremely broad, ranging across the domains of molecules, cells, tissues and organs, organisms, and ecosystems. Moreover, biology explores questions of evolutionary history and the processes of evolutionary change as well as the mechanisms by which cells, organisms, and ecosystems function. Students majoring in Molecular, Cellular, and Developmental Biology receive a thorough yet varied liberal education and preparation for professional careers in a diverse array of fields. Practical applications of biology include the development of biologicals and pharmaceuticals, the practice of medicine, and pursuit of the scientific bases for understanding the development and function of biological systems.

Molecular, Cellular, and Developmental Biology (MCDB) offers programs for students wishing to concentrate on molecular and cellular biology and genetics, with applications to problems in cell and developmental biology, neurobiology, and various aspects of computational biology. Interdisciplinary opportunities are available within the major in the biotechnology, neurobiology, and quantitative biology tracks.

The MCDB major offers many opportunities for independent laboratory research. With approval, research can be conducted under the supervision of faculty members in any Yale department. Some programs for study abroad are available to MCDB majors; approved programs can fulfill some of the requirements for the major. Interested students should consult the director of undergraduate studies and the Center for International and Professional Experience (<http://cipe.yalecollege.yale.edu>).

**Prerequisites** The basic science courses required of all MCDB majors are BIOL 101, 102, 103, 104; CHEM 112, 113, or 114, 115, or 118, taken with their associated laboratories, as well as one term of organic chemistry with laboratory (CHEM 124, 125 with 222L, 223L satisfies both the general and organic chemistry requirements); two terms of PHYS 170, 171 or higher; and one term of MATH 115 or above (excluding MATH 190). The second term of organic chemistry, CHEM 230, may be used as an elective in the major. Note that these prerequisites fulfill most of the usual premedical science requirements.

Acceleration credit awarded in chemistry, mathematics, and physics, or completion of advanced courses in those departments, is accepted instead of the corresponding prerequisites for the MCDB major. Students who have mathematics preparation equivalent to MATH 115 or higher are encouraged to take additional mathematics courses, such as MATH 120, 121, 222, or 225; or ENAS 151 or 194.

**Placement** For students in the Class of 2016 and subsequent classes, placement in MCDB courses is determined by examinations administered at Yale. Based on the results of the examinations, a student may place out of one or more courses in the BIOL 101–104 sequence. However, one or more of these foundational Biology courses may be explicitly required as prerequisites for upper-level MCDB courses.

Students in the Class of 2015 and previous classes may place out of BIOL 101, 102, 103, and 104 by having scored 5 on the Advanced Placement test in Biology or 7 on the International Baccalaureate higher-level examination in Biology. Students in the same class years may place out of BIOL 101, 102, and 103 by having scored 710 or higher on the SAT subject matter Biology M test or on the SAT subject matter Chemistry test.

Placement in chemistry courses is arranged by the Chemistry department. Because the required chemistry courses are prerequisite to several MCDB courses, students are strongly encouraged to take general and organic chemistry in the freshman and/or sophomore years. Students who place out of general chemistry may want to consider taking organic chemistry during their freshman year. Finishing the prerequisites early allows for a more flexible program in later years.

**Requirements of the major** Beyond the prerequisites, the B.A. degree requires at least eight course credits, including seven lecture courses or seminars and two laboratories, as follows:

1. Three core courses: either MCDB 200 or 202; either MCDB 205 or 210; either MCDB 300 or MB&B 300
2. Three electives, for three course credits, from MCDB courses numbered 200 or above
3. One elective, for one course credit, from MCDB courses numbered 350 or above
4. Two MCDB laboratories numbered 201L or above
5. The senior requirement, described below

Residential college seminars do not count toward the requirements of the major. The MCDB major should not be taken as one of two majors with Molecular Biophysics and Biochemistry or with Ecology and Evolutionary Biology.

**Credit/D/Fail** No course taken Credit/D/Fail may be counted toward the MCDB major, including prerequisites.

**Neurobiology track** In addition to the three core courses for the standard major, the neurobiology track requires the additional core course MCDB 320, as well as one MCDB elective numbered 350 or above and two electives chosen from BENG 410, CPSC 475, MCDB 240, 310, 315, 415, 430, 440, PSYC 270, and either STAT 101 or PSYC 200. Other courses may be substituted with the approval of the student's track adviser. (Students should note that PSYC 110 is a prerequisite for many psychology courses but does not substitute as an elective in the neurobiology track.) Two laboratories chosen from MCDB courses numbered 201L or above are also required. Students interested in the neurobiology track should consult an adviser for the track.

*Neurobiology track advisers*

P. Forscher, 222 KBT (432-6344)

H. Keshishian, 640A KBT (432-3478)

R. Wyman, 610A KBT (432-3475)

W. Zhong, 616 KBT (432-9233)

**Biotechnology track** In addition to the three core courses for the standard major, the biotechnology track requires the additional core course MCDB 370 and three electives chosen from any MCDB course numbered 200 or above, MB&B 420, 421, 443, BENG 351, 352, 410, 435, 457, 464, CENG 210, 411, 412, CPSC 437, 445, 470, or 475. Two laboratories are required: either two from MCDB (including at least one from MCDB 342L to MCDB 345L), or BENG 355L, 356L or CENG 412. Students interested in the biotechnology track should consult an adviser for the track.

*Biotechnology track advisers*

R. Breaker, 506 KBT (432-9389)  
X. W. Deng, 352B OML (432-8908)  
K. Nelson, 710A KBT (432-5013)  
J. Wolenski, 330 KBT (432-6912)

**Quantitative Biology Track** In addition to the three core courses for the standard major, the quantitative biology track requires the additional core course MCDB 261, as well as one MCDB elective numbered 350 or above and two electives chosen from MCDB 320, 361, BENG 467, MB&B 302, 435, 452, 523, PHYS 402, MATH 246, 251, CPSC 440, 475, or CENG 320. Two laboratories chosen from MCDB courses numbered 201L or above are also required. Students interested in the quantitative biology track should consult an adviser for the track.

*Quantitative Biology track advisers*

T. Emonet, 1048 KBT (432-3516)  
D. Clark, 224 KBT (432-0750)  
M. Acar, West Campus B-31 (737-3255)

**Selection of electives** If both MCDB 200 and 202 are taken, one counts as a core course and the other as an elective. If both MCDB 205 and 210 are taken, one counts as a core course and the other as an elective. Students should not take both MCDB 300 and MB&B 300; if students take both MB&B 300 and 301, MB&B 301 may count as an elective. Two laboratory courses, either MCDB 342L and 343L or 344L and 345L, can be used together as one elective credit. If used as an elective, these laboratories cannot also fulfill the laboratory requirement. A relevant intermediate or advanced course from another department in science, engineering, mathematics, or statistics may be accepted as an elective with permission of the director of undergraduate studies. Residential college seminars cannot be substituted for electives.

Many of the courses in other departments listed above have prerequisites; such prerequisites can be substituted for an upper-level elective with permission of the director of undergraduate studies.

**Senior requirement** In addition to the course requirements described above, all students must satisfy a senior requirement undertaken during the senior year. A booklet listing the requirements of each track and degree is available in the office of the director of undergraduate studies (1220B KBT). All students must fill out a checklist of requirements and go over it with the undergraduate registrar, Crystal Adamchek, by the spring term of the junior year. For the B.A. degree the senior requirement can be met in any one of three ways: by submitting a senior essay of fifteen to twenty pages evaluating current research in a field of biology; by successful completion of one term of tutorial work (MCDB 470); or by successful completion of one term of individual research (MCDB 475).

A senior choosing to fulfill the requirement with a senior essay must consult with a faculty adviser on the scope and literature of the topic and submit the adviser's written approval to the director of undergraduate studies no later than the course selection period of the term in which the paper is due. The senior essay may be related to the subject matter of a course, but the essay is a separate departmental requirement in addition to any work done in a course and does not count toward the grade in any course. The senior essay must be completed and submitted to the office of the director

of undergraduate studies by the last day of classes. Students electing this option should obtain an approval form from the office of the director of undergraduate studies.

**B.S. degree** The requirements for the B.S. degree are the same as for the B.A. degree except for the senior requirement, which differs in its greater emphasis on individual research. The senior requirement for the B.S. is usually fulfilled by completing a yearlong research course, MCDB 485, 486. Alternatively, two consecutive terms of MCDB 475 can be taken during the senior year. In the case of a two-term project in MCDB 475, and with permission of the director of undergraduate studies, it is possible for a student to begin the project during the spring term of the junior year, continue it over the summer, and complete it during the fall term of the senior year. In all other cases, the senior requirement must be completed during the senior year. Yale College does not grant academic credit for summer research unless the student is enrolled in an independent research course in Yale Summer Session. Seniors working toward the B.S. degree are expected to spend at least ten hours per week conducting individual research.

**B.S. degree, intensive major** Requirements for the B.S. degree with an intensive major are the same as those for the B.A. degree except that students take an additional seminar numbered MCDB 350 or higher and fulfill the senior requirement by taking MCDB 495, 496, Intensive Research, for four course credits. The additional seminar does not need to be taken during the senior year. Seniors in the intensive major are expected to spend at least twenty hours per week conducting individual research.

**Research courses before senior year** The research courses MCDB 475, 485, 486, and 495, 496 exist primarily to fulfill the senior requirement, and do not satisfy any other requirement for the major. Some students may wish to take MCDB 475 earlier in their course of study. This contributes to the thirty-six course credits required for graduation, but does not substitute for any of the other major requirements, including the senior requirement. Note that Yale College limits the number of independent study or independent research courses that students may take; see Course Credits and Course Loads (p. 43) in the Academic Regulations (p. 32). Any independent study course, regardless of its number, is included in the total. All terms of MCDB 475 taken count in the calculation for Distinction in the Major.

**Combined B.S./M.S. degree program** Exceptionally able and well-prepared students may accelerate their professional education by completing a course of study leading to the simultaneous award of the B.S. and M.S. degrees after eight terms of enrollment. Students may not enroll in Yale College for more than eight terms in order to qualify for the simultaneous award of both degrees. It is possible to earn both degrees in fewer than eight terms, but not by the use of acceleration credits. The requirements are as follows:

1. Candidates must satisfy the Yale College requirements for the B.S. degree. Students in the program must complete the three or four core courses for the major (depending on track) and choose their three or four electives from graduate-level courses. One of these electives must be a graduate seminar selected with the approval of the director of undergraduate studies. Grades below B- in graduate courses are not accepted.
2. In addition to the courses specified above, students must complete two graduate research courses for six course credits: (a) MCDB 585, a two-credit course taken

in the second term of the junior year. At the start of the course, each student forms a committee comprised of the faculty adviser and two faculty members that meets to discuss the research project. Two of the members of this committee must be members of the MCDB faculty. At the end of the course, the student completes a detailed prospectus describing the thesis project and the work completed to date. The committee evaluates an oral and written presentation of the prospectus and determines whether the student may continue in the combined program;

(b) MCDB 595, a four-credit, yearlong course that is similar to MCDB 495, 496 and is taken during the senior year. During the course, the student gives an oral presentation describing the work. At the end of the course, the student is expected to present his or her work to the department in the form of a poster presentation. In addition, the student is expected to give an oral thesis defense, followed by a comprehensive examination of the thesis conducted by the thesis committee. Upon successful completion of this examination, as well as all other requirements, the student is awarded the combined B.S./M.S. degree.

Students must also satisfy the requirements of Yale College for the simultaneous award of the bachelor's and master's degrees, including the following:

1. To be considered for admission to the program, by the end of their fifth term of enrollment students must have achieved at least two-thirds A or A– grades in all of their course credits as well as in all of the course credits directly relating to the major, including prerequisites.
2. Students must apply in writing to the director of undergraduate studies and obtain departmental approval no later than the last day of classes in their fifth term of enrollment in Yale College. Students must have the approval of both the director of undergraduate studies and the director of graduate studies to receive graduate credit for the graduate courses they select.
3. Graduate work must not be entirely concentrated in the final two terms, and students in the program must take at least six term courses outside the department during their last four terms at Yale and at least two undergraduate courses during their last two terms.
4. Students must earn grades of A in at least two of their graduate-level term courses (or in one yearlong course) and have at least a B average in the remaining ones.

For more information, see "Simultaneous Award of the Bachelor's and Master's Degrees" under section K, Special Arrangements (p. 63), in the Academic Regulations.

**Advising** Freshmen considering a major in Molecular, Cellular, and Developmental Biology are invited to consult with the director of undergraduate studies and/or a faculty member in MCDB who is a fellow of their residential college. For assistance in identifying a suitable adviser, students should contact the departmental undergraduate registrar, Crystal Adamchek. Students in the biotechnology, neurobiology, or quantitative biology track should consult an adviser for their track (listed above). The course schedules of all MCDB majors (including sophomores intending to major in MCDB) must be signed by a faculty member in the department. The signature of the director of undergraduate studies is required only for students who are fulfilling the requirements of two majors or who have been admitted to the simultaneous B.S./M.S.



degree program. Students whose regular adviser is on leave can consult the office of the director of undergraduate studies to arrange for an alternate.

Any faculty member with a primary appointment in the MCDB department can serve as a faculty adviser to majors. College faculty advisers available to freshmen are listed below.

BK	M. García-Castro, J. Wolenski	MC	X. W. Deng, H. Keshishian, K. Nelson, F. Slack
BR	N. Clay, I. Dawson	PC	J. Carlson, C. Crews
CC	M. Mooseker [F], R. Wyman [F]	SY	C. Jacobs-Wagner
DC	C. Bascom-Slack, V. Irish, W. Zhong	SM	S. Dellaporta [F], D. Kankel, J. Rosenbaum [Sp]
TD	S. Holley	ES	to be announced
JE	R. Breaker, T. Emonet, F. Isaacs, T. Nelson	TC	S. Altman [F]

## REQUIREMENTS OF THE MAJOR

**Prerequisites** BIOL 101, 102, 103, 104; CHEM 112, 113, or 114, 115, or 118, with labs, and 1 term of organic chem with lab (CHEM 124, 125 with 222L, 223L satisfies both the general and organic chem prereqs); PHYS 170, 171 or higher; MATH 115 or above (except MATH 190); all courses taken for letter grades

**Number of courses** *B.A.* – 7 courses and 2 labs beyond prereqs taken for letter grades, totaling at least 8 course credits; *B.S.* – 9 courses and 2 labs beyond prereqs taken for letter grades, totaling at least 10 course credits; *B.S., intensive major* – 10 courses and 2 labs beyond prereqs taken for letter grades, totaling at least 13 course credits

**Specific courses required** *All tracks* – MCDB 200 or 202; MCDB 205 or 210; MCDB 300 or MB&B 300; *Biotechnology track* – MCDB 370; *Neurobiology track* – MCDB 320; *Quantitative Biology track* – MCDB 261

**Distribution of courses** *Standard track* – 3 electives from MCDB numbered 200 or above; 1 addtl MCDB course numbered 350 or above; 2 labs in MCDB numbered 201L or above; *Biotechnology, Neurobiology, and Quantitative Biology tracks* – 3 electives and two labs as specified

**Senior requirement** *B.A.* – MCDB 470 or 475 taken in senior year, or senior essay; *B.S.* – 2 consecutive terms of MCDB 475, or MCDB 485, 486

**Intensive major** 1 addtl sem numbered MCDB 350 or higher; MCDB 495, 496 in senior year

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## Introductory Courses

\* **MCDB 040b, The Science and Politics of Cancer** Robert Bazell

Fundamentals of cell biology, Darwinian evolution, immunology, and genetics that underlie cancer; the history of cancer science and treatment; historical and current policy issues. Prerequisite: a score of 5 on the Advanced Placement test in Biology or equivalent. Enrollment limited to freshmen; preregistration required. May not be taken after CSSY 290. SC

**\* MCDB 050a, Immunology and Microbes** Paula Kavathas

Introduction to the immune system and its interaction with specific microbes. Attention both to microbes that cause illness, such as influenza, HIV, and HPV, and to microbes that live in harmony with humans, collectively called the microbiome. Readings include novels and historical works on diseases such as polio and AIDS. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SC RP

**[ MCDB 060, Topics in Reproductive Biology ]****[ MCDB 061, Topics in Reproductive Biology ]****\* MCDB 103b, Cancer** Alexia Belperron

Introduction to the biology of cancer, with a focus on leukemia, skin cancer, and cancers linked to infection. Topics include genetics, biochemistry, immunity, infection agents, and challenges for prevention and treatment. Intended for non–science majors and underclassmen. SC

**MCDB 105a or b / MB&B 105a or b, An Issues Approach to Biology** Staff

Biological concepts taught in context of current societal issues, such as stem cell research and genetically modified organisms. Emphasis on biological literacy to enable students to evaluate scientific arguments. SC

**\* MCDB 106a / HLTH 155a, Biology of Malaria, Lyme, and Other Vector-Borne Diseases** Alexia Belperron

Introduction to the biology of pathogen transmission from one organism to another by insects; special focus on malaria and Lyme disease. Biology of the pathogens including modes of transmission and establishment of infection; immune responses and the associated challenges to prevention and treatment. Intended for non–science majors; preference to freshmen and sophomores. Prerequisite: high school biology. SC

**\* MCDB 109b, Immunity and Contagion** Paula Kavathas

Introduction to the basics of the immune system; strategies to fight pathogens while maintaining harmony with our microbiome. Discussion of specific microbes such as influenza, HIV, and HPV; historical analysis of the polio vaccine and the AIDS epidemic. Enrollment limited to freshmen and sophomores. SC RP

**MCDB 123b, Genes and Environment** Nichole Broderick and Staff

The nature of biological thought and inquiry explored through study of the interplay between genes and the environment. Influence of the microbial world on the physiology and evolution of organisms. Tools from molecular biology and genomics are used to examine the effects of internal and external factors on gene expression, how the process of gene expression leads to observable characteristics, and the relationship between bacterial gene expression and human survival. Intended for non–science majors. SC

**\* MCDB 166b, From Microbes to Molecules I** Carol Bascom-Slack and Tiffany Tsang

The first term of a yearlong introduction to biology and chemistry through research on soil bacteria. Focus on the discovery of antibiotics from soil bacteria isolated from the Yale campus. Diversity of life, structure of biomolecules, components of a cell, molecular basis of gene expression, heritability, and symbiosis. Comparison with eukaryotic molecular and cellular biology. Class sessions include lecture and laboratory components. Enrollment limited to freshmen and sophomores. SC 1½ Course cr

## Intermediate and Advanced Courses

### **MCDB 200b, Molecular Biology** Anna Pyle

A study of the fundamental principles of molecular biology, including the experimental methodologies used in biological research. Topics include the structure, function, and chemical behavior of biological macromolecules (DNA, RNA, and protein), chromosome and genome organization, replication and maintenance of the genome, transcriptional and translational regulation, microRNAs and other noncoding RNAs, RNA processing, systems biology, and synthetic biology. Designed to provide an accelerated venue for MCDB majors and other students seeking to understand the molecular basis for gene expression and the resultant implications for medicine and biological engineering. Prerequisites: CHEM 112, 114, or 118, and BIOL 101 or equivalent performance on the corresponding biological sciences placement examination; or permission of instructor. SC

Psychology: AdvSci NeuroTrk

### \* **MCDB 201Lb, Molecular Biology Laboratory** Maria Moreno

Basic molecular biology training in a project-based laboratory setting. Experiments analyze gene function through techniques of PCR, plasmid and cDNA cloning, DNA sequence analysis, and protein expression and purification. Instruction in experimental design, data analysis, and interpretation. For freshmen and sophomores. Concurrently with or after MCDB 200. Special registration procedures apply. Interested students must contact the instructor and attend an organizational meeting during the first week of classes. WR, SC ½ Course cr

### \* **MCDB 202a, Genetics** Stephen Dellaporta and Joshua Gendron

An introduction to classical, molecular, and population genetics of both prokaryotes and eukaryotes and their central importance in biological sciences. Emphasis on analytical approaches and techniques of genetics used to investigate mechanisms of heredity and variation. Topics include transmission genetics, cytogenetics, DNA structure and function, recombination, gene mutation, selection, and recombinant DNA technology. Prerequisite: BIOL 103 or equivalent performance on the corresponding biological sciences placement examination. SC RP

### \* **MCDB 203La, Laboratory for Genetics** Iain Dawson

Introduction to laboratory techniques used in genetic analysis. Genetic model organisms – bacteria, yeast, *Drosophila*, and *Arabidopsis* – are used to provide practical experience with various classical and molecular genetic techniques including cytogenetics; complementation, epistasis, and genetic suppressors; mutagenesis and mutant analysis, recombination and gene mapping, isolation and manipulation of DNA, and transformation of model organisms. Concurrently with or after MCDB 202.

SC ½ Course cr

### **MCDB 205b, Cell Biology** Thomas Pollard

A comprehensive introductory course in cell biology. Emphasis on the general principles that explain the molecular mechanisms of cellular function. Prerequisites: BIOL 101 and 102, or equivalent performance on the corresponding biological sciences placement examinations, or a score of 5 on the Advanced Placement test in Biology, or a score of 710 or above on the SAT Biology M test, or MCDB 200. SC

**\* MCDB 210a, Developmental Biology**

Scott Holley, Douglas Kankel, and Vivian Irish

Cellular differentiation and its genetic and molecular control; fertilization, cleavage, and morphogenesis of plants and animals; polarity and positional information; organogenesis and development of specialized tissues; evolution and development. Prerequisites: BIOL 101, 102, and 103, or equivalent performance on the corresponding biological sciences placement examinations. SC

**MCDB 221La, Model Organisms in Biological Research** Maria Moreno

An introduction to research and common methodologies in the biological sciences, with emphasis on the utility of model organisms. Techniques and methods commonly used in biochemistry, cell biology, genetics, and molecular and developmental biology; experimental design; data analysis and display; scientific writing. Concurrently with or after BIOL 101, 102, or 103, or equivalent performance on the corresponding biological sciences placement examinations, or with permission of instructor. SC ½ Course cr

**MCDB 240b, Biology of Reproduction** Hugh Taylor and Mary Klein

Introduction to reproductive biology, with emphasis on human reproduction. Development and hormonal regulation of reproductive systems; sexuality, fertilization, and pregnancy; modern diagnosis and treatment of reproductive and developmental disorders; social and ethical issues. Prerequisites: BIOL 101, 102, and 103, or equivalent performance on the corresponding biological sciences placement examinations, or a score of 5 on the Advanced Placement test in Biology, or a score of 710 or above on the SAT Biology M test. SC

**MCDB 241Lb, Laboratory for Biology of Reproduction and Development** Mary Klein

Laboratory investigation of reproductive and developmental processes in classic vertebrate and invertebrate systems, with emphasis on mammalian reproduction and development. Topics include gametogenesis, ovulation, hormonal control of reproduction, and investigation of embryogenesis in the mouse, frog, and fruit fly. Enrollment limited. Concurrently with or after MCDB 210 or 240. Not open to freshmen. Special registration procedures apply; students must consult the instructor prior to the first week of classes. SC ½ Course cr

**MCDB 261b, Introduction to Dynamical Systems in Biology**

Thierry Emonet and Staff

An introduction to quantitative methods in biology, emphasizing numerical and analytical modeling of processes in biological systems. Instruction in the use of MATLAB; writing, understanding, and solving differential equations. Topics include switches, feedback, regulatory networks, cooperativity, and signal transduction. Prerequisite: PHYS 170 or equivalent, or with permission of instructor. QR, SC

**MCDB 290b, Microbiology** Christine Jacobs-Wagner and Carol Bascom-Slack

Cell structure of microorganisms, bacterial genetics, microbial evolution and diversity, microbial development, microbial interaction, chemotaxis and motility, gene regulation, microbial genomics, host defense systems, infectious diseases, viruses, and biological weapons. Prerequisites: BIOL 101 and 102, or a term of biochemistry, genetics, cell biology, or molecular biology. SC

**\* MCDB 291Lb, Laboratory for Microbiology** Iain Dawson

Practical approaches used when working with microbes, primarily bacteria. Topics include microscopy, culture techniques, biochemical/metabolic assays, and basic

environmental and medical microbiology. Concurrently with or after MCDB 290. Electronic permission key required; students should contact the instructor prior to the first class meeting. SC ½ Course cr

**\* MCDB 300a or b / MB&B 200a or b, Biochemistry** Staff

An introduction to the biochemistry of animals, plants, and microorganisms, emphasizing the relations of chemical principles and structure to the evolution and regulation of living systems. Prerequisites: BIOL 101 or equivalent performance on the corresponding biological sciences placement examination; one term of organic chemistry; or with permission of instructor. SC

**\* MCDB 301La / MB&B 251La, Laboratory for Biochemistry** William Konigsberg

An introduction to current experimental methods in molecular biology. After or concurrently with MB&B 200 or 300. Limited enrollment. Requires preregistration by e-mail to Aruna Pawashe and William Konigsberg prior to the first week of classes. SC ½ Course cr

**\* MCDB 303Lb, Advanced Molecular Biology Laboratory**

Maria Moreno and Kenneth Nelson

A laboratory course that provides advanced research skills in molecular biology. Weekly workshops focus on laboratory practice, experimental design, data analysis, reading of primary literature, scientific presentations, and scientific writing skills. Application of these skills in project-based laboratory training sponsored by a faculty member. Enrollment limited. For juniors who have completed MCDB 201L, 221L, or equivalent and are planning their senior research projects. No research laboratory experience required. Special registration procedures apply; interested students must contact the instructor and attend an organizational meeting. SC RP

**\* MCDB 310a / BENG 350a, Physiological Systems** Stuart Campbell

Regulation and control in biological systems, emphasizing human physiology and principles of feedback. Biomechanical properties of tissues emphasizing the structural basis of physiological control. Conversion of chemical energy into work in light of metabolic control and temperature regulation. Prerequisites: CHEM 113 or 115, or PHYS 180 and 181; MCDB 120, or BIOL 101 and 102. SC

**MCDB 315b, Biological Mechanisms of Reaction to Injury**

Joseph Madri, Jon Morrow, Jeffrey Sklar, S. David Hudnall, and Joanna Gibson  
Human biology and disease as a manifestation of reaction to injury. Organ structure and function, cell injury, circulatory and inflammatory responses, disordered physiology, and neoplasia. Enrollment limited; preference to junior and senior majors in MCDB or MB&B. Prerequisite: MCDB 205, 300, or 310. SC RP

**MCDB 320a, Neurobiology** Haig Keshishian and Paul Forscher

The excitability of the nerve cell membrane as a starting point for the study of molecular, cellular, and systems-level mechanisms underlying the generation and control of behavior. After a year of college-level chemistry; a course in physics is strongly recommended. SC

**MCDB 321La, Laboratory for Neurobiology**

Haig Keshishian, Robert Wyman, and Brett Berke

Introduction to the neurosciences. Projects include the study of neuronal excitability, sensory transduction, CNS function, synaptic physiology, and neuroanatomy.

Concurrently with or after MCDB 320. SC ½ Course cr

**\* MCDB 342La, Laboratory in Nucleic Acids I** Kenneth Nelson

A project from a research laboratory within the MCDB department, using technologies from molecular and cell biology. Laboratories meet twice a week for the first half of the term. Concurrently with or after MCDB 202, 205, or 300. Enrollment limited. Special registration procedures apply; students must consult the instructor prior to the first week of classes. SC ½ Course cr

**\* MCDB 343La, Laboratory in Nucleic Acids II** Kenneth Nelson

Continuation of MCDB 342L to more advanced projects in molecular and cell biology, such as making and screening cDNA libraries, microarray screening and analysis, or next-generation DNA sequencing. Laboratories meet twice a week for the second half of the term. Prerequisite: MCDB 342L or permission of instructor. Enrollment limited. Special registration procedures apply; students must consult the instructor prior to the first week of classes. SC ½ Course cr

**\* MCDB 344Lb, Experimental Techniques in Cellular Biology** Joseph Wolenski

An inquiry-based approach to research in cell and molecular biology, with emphasis on experimental techniques commonly used in modern biomedical laboratories. Research is module-based and covers pertinent and timely topics. Methods include SDS-PAGE, immunoblotting, immunoprecipitation of proteins, column chromatography, mammalian cell culture, cell fractionation, cell transfection, plasmid design, DNA purification, PCR, and phase contrast and confocal microscopy. Meets during January and February. Prerequisite: MCDB 205. Special registration procedures apply; interested students must contact the instructor at least eighteen months in advance. SC ½ Course cr

**\* MCDB 345Lb, Experimental Strategies in Cellular Biology** Joseph Wolenski

Continuation of MCDB 344L, with increased emphasis on experimental design, independent research, and presentation of data. Students develop semi-independent research projects in modern biomedical research. Emphasis on key components of being a successful principal investigator, including benchwork, seminar presentations, lab meetings, and critical analysis of data. Prepares for MCDB 475, 485, or 495. Meets during March and April. Prerequisite: MCDB 344L. Special registration procedures apply; interested students should contact the instructor. SC ½ Course cr

**MCDB 361a, Dynamical Systems in Biology** Thierry Emonet

Advanced topics related to dynamical processes in biological systems. Processes by which cells compute, count, tell time, oscillate, and generate spatial patterns. Time-dependent dynamics in regulatory, signal-transduction, and neuronal networks; fluctuations, growth, and form. Comparisons between models and experimental data. Use of MATLAB to create models. Prerequisite: MCDB 261 or equivalent, or a 200-level biology course, or with permission of instructor. QR

**\* MCDB 370b, Biotechnology**

Craig Crews, Kenneth Nelson, Nicole Clay, and Joseph Wolenski

The principles and applications of cellular, molecular, and chemical techniques that advance biotechnology. The most recent tools and strategies used by industrial labs, academic research, and government agencies to adapt biological and chemical compounds as medical treatments, as industrial agents, or for the further study of biological systems. Prerequisite: MCDB 200, 202, or 300. SC

**\* MCDB 387b, The Eukaryotic Cell Cycle** Iain Dawson

The regulation and coordination of the eukaryotic cell cycle examined by means of a detailed critique of primary literature. Particular attention to the role of the cell cycle in the processes of development and differentiation and in cancer and other diseases. Students develop an understanding of experimental approaches to problem solving. Enrollment limited, with preference to juniors and seniors. Prerequisites: BIOL 101, 102, and 103, or equivalent performance on the corresponding biological sciences placement examinations; MCDB 202, 205, or 210. Electronic permission key required. Students must contact the instructor prior to the first class meeting. SC

**MCDB 425a / MB&B 425a, Basic Concepts of Genetic Analysis** Tian Xu

The universal principles of genetic analysis in eukaryotes. Reading and analysis of primary papers that illustrate the best of genetic analysis in the study of various biological issues. Focus on the concepts and logic underlying modern genetic analysis. Prerequisite: MCDB 200 or equivalent. SC

**\* MCDB 430a, Biology of the Immune System** Carla Rothlin

The development of the immune system. Cellular and molecular mechanisms of immune recognition. Effector responses against pathogens. Immunologic memory and vaccines. Human diseases including allergy, autoimmunity, immunodeficiency, and HIV/AIDS. After MCDB 300. SC

**\* MCDB 435a, Landmark Papers in Cell Biology** Joel Rosenbaum

Discussion and critical evaluation of selected research papers that were important in determining the directions of modern cell biological research. Emphasis on the nature of the problem, evaluation of the experimental approaches and results, and the authors' interpretation of the results. Weekly discussion by all participants required. Students should contact the instructor prior to the first week of classes. Prerequisites: courses in cell biology, biochemistry, and genetics, or permission of instructor. SC

**[ MCDB 440, Brain Development and Plasticity ]****\* MCDB 450b, The Human Genome** Stephen Dellaporta

A focus on the primary scientific literature covering the principles of genomics and its application to the investigation of complex human traits and diseases. Topics include the technology of genome sequencing and resequencing, the characterization of sequence and structural variation in human populations, haplotype and linkage disequilibrium analysis, genome-wide association studies, the comparative genomics of humans and our closest relatives, and personalized genomics and medicine. Enrollment limited to 15. Students should contact the instructor prior to the first week of classes. Prerequisite: MCDB 202; a course in statistics is strongly recommended. SC

**MCDB 452b / MB&B 452b, Bioinformatics: Practical Application of Simulation and Data Mining** Mark Gerstein

Techniques in data mining and simulation applied to bioinformatics, the computational analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. Sequence alignment, comparative genomics and phylogenetics, biological databases, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, microarray normalization, and machine-learning approaches to data integration. Prerequisites: MB&B 301 and MATH 115, or permission of instructor. SC

**\* MCDB 470a or b, Tutorial in Molecular, Cellular, and Developmental Biology**  
Douglas Kankel

Individual or small-group study for qualified students who wish to investigate a broad area of experimental biology not presently covered by regular courses. A student must be sponsored by a Yale faculty member, who sets the requirements. The course must include one or more written examinations and/or a term paper. Intended to be a supplementary course and, therefore, to have weekly or biweekly discussion meetings between the student and the sponsoring faculty member. To register, the student must prepare a form, which is available at <http://mcdB.yale.edu/forms> as well as on the course site on Classes\*v2, and a written plan of study with bibliography, approved by the faculty research adviser. The form and proposal must be uploaded to Classes\*v2 by the end of the second week of classes. The final paper is due in the hands of the sponsoring faculty member, with a copy to the course instructor, by the last day of classes. In special cases, with approval of the director of undergraduate studies, this course may be elected for more than one term, but only one term may count as an elective toward the major. Fulfills the senior requirement for the B.A. degree if taken in the senior year.

**\* MCDB 475a or b, Research** John Carlson

Research projects under faculty supervision, ordinarily taken to fulfill the senior requirement. This course may be taken before the senior year, but it cannot substitute for other requirements. Students are expected to spend approximately ten hours per week in the laboratory. To register, the student must prepare a form, which is available at <http://mcdB.yale.edu/forms> as well as on the course site on Classes\*v2, and a written plan of study with bibliography, approved by the faculty research adviser. The form and proposal must be uploaded to Classes\*v2 by the end of the second week of classes. The final research paper is due in the hands of the sponsoring faculty member, with a copy uploaded to Classes\*v2, by the last day of classes. Seniors taking this course to fulfill the senior requirement must give an oral presentation of their research at the end of the term. Students who take this course more than once must reapply each term; students planning to conduct two terms of research should consider enrolling in MCDB 485, 486. Students should line up a research laboratory during the term preceding the research. Fulfills the senior requirement for the B.A. degree if taken in the senior year. Two consecutive terms of this course fulfill the senior requirement for the B.S. degree if at least one term is taken in the senior year.



\* **MCDB 482a, Advanced Seminar in Cell Biology: Intracellular Signal Transduction**

Craig Crews

Discussion of intracellular signal transduction pathways. Detailed critique of experimental approaches, controls, results, and conclusions of selected current and classic papers in this field. SC

\* **MCDB 485a and MCDB 486b, Research in Molecular, Cellular, and Developmental Biology** John Carlson

Individual two-term laboratory research projects under the supervision of a faculty member. Students are expected to spend ten to twelve hours per week in the laboratory, and to make presentations to students and advisers. Written assignments include a short research proposal summary due at the beginning of the first term, a grant proposal due at the end of the first term, and a research report summarizing experimental results due at the end of the second term. Students are also required to present their research in either the fall or the spring term. A poster session is held at the end of the spring term. Students should line up a research laboratory during the term preceding the research. Guidelines for the course may be obtained on the departmental Web site (<http://www.biology.yale.edu/undergrad/forms.html>) and on the course site on Classes\*v2 (<https://classesv2.yale.edu/portal>). Written proposals are due by the end of the second week of classes. Fulfills the senior requirement for the B.S. degree if taken in the senior year.

\* **MCDB 495a and MCDB 496b, Intensive Research in Molecular, Cellular, and Developmental Biology** John Carlson

Qualified students may undertake directed research in some field of biology during the senior year. Before registering for this course, the student must be accepted for a research project by a Yale faculty member with a research program in experimental biology and obtain the approval of the instructor in charge of the course. Students spend approximately twenty hours per week in the laboratory, and make written and oral presentations of their research to students and advisers. Written assignments include a short research proposal summary due at the beginning of the first term, a grant proposal due at the end of the first term, and a research report summarizing experimental results due at the end of the second term. Students must attend a minimum of three research seminar sessions (including their own) per term. Students are also required to present their research during both the fall and spring terms. A poster session is held at the end of the spring term. Guidelines for the course may be obtained on the departmental Web site (<http://www.biology.yale.edu/undergrad/forms.html>) and on the course site on Classes\*v2 (<https://classesv2.yale.edu/portal>). Written proposals are due by the end of the second week of classes. Fulfills the senior requirement for the B.S. degree with an intensive major. 2 Course cr per term

## Music

Director of undergraduate studies: Ian Quinn, 205 STOECK, 432-2986,  
[dus.music@yale.edu](mailto:dus.music@yale.edu); [yalemusic.yale.edu](http://yalemusic.yale.edu)

### FACULTY OF THE DEPARTMENT OF MUSIC

**Professors** Kathryn Alexander (*Adjunct*), Richard Cohn, Michael Friedmann (*Adjunct*), Daniel Harrison, Paul Hawkshaw (*Adjunct*), James Hepokoski (*Chair*), Richard Lalli

(*Adjunct*), Patrick McCreless, Leon Plantinga (*Emeritus*), Ian Quinn, Ellen Rosand (*Emeritus*), Gary Tomlinson, Michael Veal, Craig Wright

**Associate Professors** Robert Holzer (*Adjunct*), Brian Kane, Gundula Kreuzer, Markus Rathey (*Adjunct*), Toshiyuki Shimada (*Adjunct*)

**Assistant Professors** Rebekah Ahrendt, Henry Parkes, Ève Poudrier, Anna Zayaruznaya

**Lecturers** Daniel Egan, Joel Fram, Andrew Gerle, Grant Herreid, Maho Ishiguro, Annette Jolles, Konrad Kaczmarek, Jeffrey Klitz, Sarah Kohane, Nathan Martin, Joshua Rosenblum, Joseph Salem, Stanley Scott, Wendy Sharp

The Department of Music offers introductory and advanced instruction in the history of music, the theory of music, composition, music technology, and performance. Level I courses, which are introductory courses numbered from 100 to 199, are open to all undergraduates and require no previous experience in music. Intermediate courses (Levels II and III) are numbered in the 200s and 300s, and require a familiarity with music notation. Advanced courses (Level IV) are numbered in the 400s and are for seniors, juniors, and qualified sophomores. Level III and IV courses are intended primarily for students majoring in Music, but they may be elected by others who meet the stated prerequisites.

Qualified students, whether majoring in Music or not, may offer up to four terms of instruction in performance for academic credit toward the 36-course-credit requirement for the bachelor's degree (MUSI 360, 361, 460, and 461). Of these four credits, only two may be applied to the major in Music. See MUSI 360, Performance: First Term, for additional information.

**The major** The Music major provides a general music program in the humanities, as well as preparation for graduate studies or for careers in music. The standard major consists of twelve term courses, eleven of which must be numbered 300 or above, excluding the prerequisites, MUSI 210, 211, 218, and 219. To gain a comprehensive familiarity with the history and theory of music, a student majoring in Music completes a survey of music history from the medieval period to the present, a survey of world music, and a two-course music theory requirement. The survey courses in music history and world music are MUSI 350, 351, 352, and 353. Students choose two courses from the music theory series numbered 301 through 311 to satisfy the music theory requirement. Also required is one course designated "Senior sem" during the senior year. Five additional term courses in music chosen from Levels II, III, and IV (only one of which is from Level II) complete the major. Prospective majors are advised to begin the required courses by their sophomore year.

Students intending to go on to graduate work are advised to study German and French to achieve at least a reading knowledge of those languages. All Music majors are urged to undertake regular studies in musical performance.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

**Senior requirement** Each student majoring in Music must satisfy a senior departmental requirement by electing a senior seminar (designated "Senior sem" in the course listing) during one of the final two terms. The final essay or composition for

the senior seminar should provide an appropriate culmination to the student's work in the major and in Yale College. In exceptional circumstances, a graduate seminar in the Music department may substitute for the senior seminar; this requires permission both from the director of graduate studies and from the director of undergraduate studies. Senior seminars are also open to interested juniors with the permission of the instructor and the director of undergraduate studies, but one designated senior seminar must be taken in the senior year to fulfill the senior requirement.

**The intensive major** The intensive major is for students of high standing who are qualified to do independent and original work in the history or theory of music or in composition. Those admitted to this major elect MUSI 490, 491 in the senior year in addition to the senior seminar.

**B.A./M.M. Program** Students in Yale College possessing outstanding ability in performance or composition may anticipate, through their undergraduate programs, one year of the Master of Music program in the School of Music, provided they have completed four terms of performance (MUSI 360, 361, 460, and 461) and MUSI 210 and 211 by the end of the junior year.

The program is open to majors both in Music and in other subjects. Majors in subjects other than Music may present four courses toward the M.M. degree in addition to four terms of performance. These courses normally include two from the music theory sequence numbered 301–311 and two from MUSI 350, 351, 352, and 353, taken by the end of the junior year.

Candidates admitted to the B.A./M.M. program are expected to sit for placement examinations and juries in the School of Music at the beginning of their senior year. They must take lessons and MUS 544, the School of Music Seminar in the Major, in that year and they are advised to take two terms of a performance ensemble if their schedules permit. Students seeking the B.A./M.M. degree in an orchestral instrument are required to participate in the Yale Symphony Orchestra or the School of Music Philharmonia during their senior year. Composers, singers, and keyboard players should consult their principal teacher about requirements in the senior year beyond the lessons and seminar.

Interested students should consult their principal teacher at the beginning of the first term of their junior year and file an application in the Office of Student Affairs at the School of Music.

Students who have accelerated the undergraduate program are ineligible to apply for the B.A./M.M. program.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** MUSI 210, 211, 218, and 219, or equivalents

**Number of courses** 12 term courses beyond prereqs, 11 numbered 300 or above

**Specific courses required** MUSI 350, 351, 352, 353, and 2 from 301–311

**Distribution of courses** 5 addtl courses from Levels II, III, IV, of which only 1 is from Level II

**Senior requirement** 1 senior sem

**Intensive major** Senior sem and senior essay or project (MUSI 490, 491)

## Freshman Seminars

\* **MUSI 009a, Jazz and Architecture** Michael Veal

A conceptual and structural comparison between modern jazz and modern architecture after World War II, focusing on recent experimental currents in each discipline. Effects of digital technology on both sonic and architectural practices. Form, structure, and material used in free jazz; processes in contemporary architecture that can be compared with those in modern jazz. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **MUSI 010b / HUMS 050b, Music and Diplomacy** Rebekah Ahrendt

The history of music in cultural diplomacy, with a focus on theoretical frameworks that grew up around musical practices as a result of music's diplomatic functions. Scores, instruments, and performers mobilized in the service of diplomacy; the influence of past practices on contemporary policy; state-sponsored musical tours; diplomatic patronage; universal vs. national music, including the use of such labels to further diplomatic goals. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **MUSI 012a, One Thousand Years of Love Songs** Anna Zayaruznaya

History of the love song in Western culture from the twelfth-century troubadours to contemporary popular hits. Music and the shifting social constructions of desire over the past millennium. The song repertory's engagement with ideas and movements such as courtly love, humanism, romanticism, sexual libertinism, and the LGBT rights movement. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU RP

\* **MUSI 030b, Faith and Doubt in Western Music** Henry Parkes

An exploration of spirituality, ideology, and philosophical worldviews in the great works of Western classical music. Religious and philosophical backgrounds of famous composers; the role of spirituality as a stimulus for creativity; the manner in which belief has shaped the reception of composers and works; the degree to which musical works communicate spiritual ideas or philosophies. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

## Level I

**MUSI 107b / HUMS 217b, Exploring the Nature of Genius** Craig Wright

The changing meanings of the term "genius" in Western culture; discussion as to whether genius is a reality. Focus on the special talents needed to respond to and shape the world in a defining fashion, and the quirky patterns of thought exemplified by great minds, principally Leonardo da Vinci, Newton, Mozart, Woolf, Beethoven, van Gogh, Picasso, and Joyce. Recent developments in neurobiology that suggest future lines of research into the minds of exceptional individuals. WR, HU

**MUSI 110a or b, Introduction to the Elements of Music** Staff

The fundamentals of musical language (notation, rhythm, scales, keys, melodies, and chords), including writing, analysis, singing, and dictation. Intended for students who have no music reading ability.

**MUSI 112a, Listening to Music** Craig Wright

Development of aural skills that lead to an understanding of Western music. The musical novice is introduced to the ways in which music is put together and is taught how to listen to a wide variety of musical styles, from Bach and Mozart, to Gregorian chant, to the blues. HU

**MUSI 130a, Introduction to the History of Western Music: 900 to 1800**

Rebekah Ahrendt

An introduction to the principal styles of Western art music through an examination of works by outstanding composers, beginning with Gregorian chant and ending with the music of Haydn and Mozart. No prerequisites. HU

**MUSI 131b, Introduction to the History of Western Music: 1800 to the Present**

Gundula Kreuzer

A survey of nineteenth- and twentieth-century composers, genres, and styles of music in Europe and America, with an emphasis on ways of listening. No prerequisites. HU

## Level II

**\* MUSI 205a or b, Tonal Harmony and Form** Staff

A thorough review of musical rudiments—scales, keys, chords, rhythm, notation—followed by a study of the fundamentals of tonal harmony and form. Emphasis on listening skills—how to hear what is happening harmonically and formally in tonal pieces without following a score. Intended for non-music majors who have proficiency in reading music. HU

**\* MUSI 210a or b, Elementary Studies in Analysis and Model Composition I** Staff

Practical investigation of the basic principles of tonal harmony, counterpoint, and composition through exercises in analysis, motivic development, phrase rhythm, texture, form, performance, and model composition. Recommended to be taken concurrently with MUSI 218 or 219. Admission after MUSI 110 or by the music theory placement test. See the *Calendar for the Opening Days* or the Music department Web site for information about the placement test. To be followed by MUSI 211. HU

**\* MUSI 211a or b, Elementary Studies in Analysis and Model Composition II** Staff

Continuation of MUSI 210. Recommended to be taken concurrently with MUSI 218 or 219. Admission after MUSI 210 or by the music theory placement test. See the *Calendar for the Opening Days* or the Music department Web site for information about the placement test. HU RP

**\* MUSI 214a, Songwriting for Composers and Lyricists** Joshua Rosenblum

Introduction to elements of music- and lyric-writing for theater songs. Focus on the development of compositional proficiency in the musical theater idiom and on the refinement of each student's compositional voice. Prerequisite: MUSI 205. Enrollment limited to 12. HU RP

**\* MUSI 215b, Conduction Ensemble** Michael Veal

Workshop in the method of conduction, or conducted improvisation. Focus on learning and executing a set of conducting gestures that shape improvisations into spontaneously generated compositions. Open to vocalists and instrumentalists from all stylistic backgrounds and musical traditions. The course culminates in a public

performance by the ensemble. No previous experience with improvisation required.

HU RP

**\* MUSI 218a or b, Elementary Musicianship I** Staff

Exercises in melodic and harmonic dictation, sight-singing, keyboard harmony, and aural analysis. Recommended to be taken concurrently with MUSI 210 or 211. RP

½ Course cr

**\* MUSI 219a or b, Elementary Musicianship II** Staff

Continuation of MUSI 218. Prerequisite: MUSI 218. Recommended to be taken concurrently with MUSI 210 or 211. RP ½ Course cr

**\* MUSI 220a and MUSI 221b, The Performance of Chamber Music** Wendy Sharp

Coached chamber music emphasizing the development of ensemble skills, familiarization with the repertoire, and musical analysis through performance.

Admission by audition only. May be repeated for credit. For audition information e-mail [wendy.sharp@yale.edu](mailto:wendy.sharp@yale.edu). Credit for MUSI 220 only on completion of MUSI 221.

RP ½ Course cr per term

**\* MUSI 222a, The Performance of Vocal Music** Richard Lalli

A course for singers and pianists that emphasizes the analysis and musical preparation of classical solo song and operatic repertoire. Examination of structure (poetic, harmonic, motivic), discussion of style, exploration of vocal techniques, and introduction to the International Phonetic Alphabet. Students are strongly encouraged to supplement the course with individual voice instruction. Admission by audition only. May be repeated for credit. For audition information e-mail [richard.lalli@yale.edu](mailto:richard.lalli@yale.edu).

HU RP

**\* MUSI 223a, The Performance of Early Music** Grant Herreid

A study of musical styles of the twelfth through early eighteenth centuries, including examination of manuscripts, musicological research, transcription, score preparation, and performance. Students in this class form the nucleus of the Yale Collegium Musicum and participate in a concert series at the Beinecke Library. Admission by audition only. May be repeated for credit. For audition information e-mail [grant.herreid@yale.edu](mailto:grant.herreid@yale.edu) HU RP

**\* MUSI 228a / THST 224a, Musical Theater Performance I** Annette Jolles

The structure and meaning of traditional and contemporary musical theater repertoire. Focus on ways to "read" a work, decipher compositional cues for character and action, facilitate internalization of material, and elicit lucid interpretations. For singers, pianists, and directors. Prerequisites: MUSI 211 and 219, or with permission of instructor. Admission by audition only. May be repeated for credit. For audition information e-mail [dan.egan@yale.edu](mailto:dan.egan@yale.edu). HU RP

**\* MUSI 229b / THST 226b, Musical Theater Performance II** Joel Fram

The collaborative process and its effect on musical theater performance. Choreography, music direction, and origination of new works. Analysis of texts, scripts, and taped or filmed performances; applications in students' own performance. May be repeated for credit. For audition information e-mail [dan.egan@yale.edu](mailto:dan.egan@yale.edu). RP

**\* MUSI 243a / HUMS 215a, Opera** Gary Tomlinson

A survey of the history of opera from its beginnings in late sixteenth-century Italy to the twentieth century. Selected works examined against the background of changing

poetic, musical, aesthetic, and social conventions. Issues of singing, staging, filming, and reviewing this multimedia art form. Counts toward the Music major as a Level III course with permission of instructor. HU

**\* MUSI 275b, The Analysis of Popular-Music Forms** Daniel Harrison

Introduction to the analysis of musical forms in popular song from 1960 to 1990. Elements of Western music such as rhythm, meter, phrase, melody, scale, mode, chord, and harmony; musical structures common in popular music, including hook, verse, chorus, and bridge. Development of skills in metrical counting, listening for difference and sameness, and long-range structural hearing. Intended for students who have no music reading ability. HU

**MUSI 277a / AFAM 203a, Coltrane and Hendrix** Michael Veal

The parallel careers of John Coltrane and Jimi Hendrix in different genres of black music explored through biographical, music-analytical, and sociocontextual approaches. The stylistic evolutions in each musician's work; the music of Coltrane and Hendrix as embodiments of, and reactions to, the dominant musical and social issues of the 1960s. HU

**\* MUSI 295a, Electronic Dance Music** Kathryn Alexander

A survey of aesthetic and historical developments in the essential techniques of synthesis, sampling, MIDI sequencing, and digital mixing and production. Focus on evolving genres of electronic dance music, including remixing, ambient, drum and bass, dub-step, hip-hop, house, techno, trance, and trip-hop. Ancillary software exercises in Ableton Live 9. Familiarity with music notation helpful but not required. HU RP

## Level III

All courses numbered 300 and above require the ability to read music.

**\* MUSI 301b, Modal Counterpoint: Analysis and Composition** Patrick McCreless

Studies in the theory, analysis, and composition of sixteenth-century modal polyphony. Prerequisite: MUSI 211. Enrollment limited to 18. Preference to Music majors according to class. RP

**\* MUSI 302a, Tonal Counterpoint: Analysis and Composition** Daniel Harrison

Intermediate studies in the theory, analysis, and composition of the music of the early and mid-eighteenth century. Prerequisite: MUSI 211. Enrollment limited to 18. Preference to Music majors according to class. HU

**\* MUSI 304a, Nineteenth-Century Music: Analysis and Model Composition**

Richard Cohn

Studies in the theory, analysis, and composition of music of the nineteenth century. Prerequisite: MUSI 211. Enrollment limited to 18. Preference to Music majors according to class. HU

**\* MUSI 305b, Twentieth-Century Music: Analysis and Model Composition**

Michael Friedmann

Studies in the theory, analysis, and composition of music of the early and mid-twentieth century. Prerequisite: MUSI 211. Enrollment limited to 18. Preference to Music majors according to class. HU

\* **MUSI 311a, Arranging for Voices** Jeffrey Klitz

An introduction to vocal arranging through analysis and skill-based exercises in the medium. Development of vocabulary and analytical skill in identifying form, function, and traditional arranging techniques through applied study, listening, and inspection of scores produced for theater, concert, recording, and historical venues. Prerequisite: MUSI 211 or equivalent. Admission by audition only. To audition, students should submit PDF scores of two arrangements, with MP3 recordings if available. RP

\* **MUSI 312a, Composition Seminar I** Kathryn Alexander

Intermediate project-oriented studies in music composition and in the instrumentation and orchestration of chamber music. Survey of contemporary techniques in selected composers' works, as well as digital notation and MIDI realization techniques in notation programs and Ableton Live 9. Prerequisite: MUSI 205 or equivalent. Admission by audition only. May be repeated for credit. Enrollment limited to 20. To audition, students should upload one or two PDF scores and MP3 recordings in a single zip file by 4 p.m. on Wednesday, September 3, to the designated 312 audition dropbox on the Composition Seminar Web page at [classesv2.yale.edu](http://classesv2.yale.edu). Students with questions should contact the instructor at [kathryn.alexander@yale.edu](mailto:kathryn.alexander@yale.edu).

\* **MUSI 313b, Composition Seminar II** Konrad Kaczmarek

Intermediate project-oriented studies in music composition and in film and video scoring. Study of selected composers' works; survey of production techniques in Logic Pro and Final Cut Pro. Prerequisite: MUSI 205, 214, or 312, or equivalent. Admission by audition only. May be repeated for credit. Enrollment limited to 20. To audition, students should upload one or two PDF scores and MP3 recordings in a single zip file by 4 p.m. on Thursday, January 15, to the designated 313 audition dropbox on the Composition Seminar Web page at [classesv2.yale.edu](http://classesv2.yale.edu). Students with questions should contact the instructor at [konrad.kaczmarek@yale.edu](mailto:konrad.kaczmarek@yale.edu). RP

\* **MUSI 314b, Composition of Musical Theater** Andrew Gerle

Intermediate and advanced project-oriented studies in composition of musical theater. Prerequisite: MUSI 210. May be repeated for credit. Enrollment limited to 12. HU RP

\* **MUSI 319a, Advanced Musicianship II** Michael Friedmann

Development of students' ability to recognize and generate structures and processes particular to music of the twentieth century. Student composers and advanced performers of post-tonal music expand their perceptive skills. Course activities include singing (and playing), dictation, identification, improvisation, and recognition. Musical examples from the works of Schoenberg, Bartók, Debussy, and Stravinsky. Enrollment limited to 14.

\* **MUSI 322b / THST 318b, Analyzing, Directing, and Performing Early Opera**

Grant Herreid

Study of a seventeenth-century Venetian opera, with attention to structural analysis of text and music. Exploration of period performance practice, including rhetorical expression, musical style, gesture, dance, Italian elocution, and visual design. Production of the opera in conjunction with the Yale Baroque Opera Project. Open to all students, but designed especially for singers and directors. Prerequisites: MUSI 211 and 219. Admission by audition only. May be repeated for credit. For audition information e-mail [grant.herreid@yale.edu](mailto:grant.herreid@yale.edu). HU RP



\* **MUSI 323a, Introduction to Conducting** Toshiyuki Shimada

An introduction to conducting through a detailed study of the problems of baton technique. Skills applied to selected excerpts from the standard literature, including concertos, recitatives, and contemporary music.

\* **MUSI 324b, Intermediate Conducting** Toshiyuki Shimada

Intermediate studies in baton technique and score preparation. After MUSI 323.

\* **MUSI 325b, Fundamentals of Music Technology** Konrad Kaczmarek

Fundamental principles of music technology including sound recording and reproduction, digital audio, digital signal processing, audio synthesis techniques, musical acoustics, and psychoacoustics. Emphasis on the theory of music technology through investigations into the tools used to analyze, perform, and create electroacoustic and computer-generated music. RP

\* **MUSI 334b, Analysis and Performance of Early Music** Grant Herreid

Continuation of MUSI 223. Analytical techniques applied to interpretation and performance. Emphasis on the development of vocal technique and sight-reading skills. Students in this class form the nucleus of the Yale Collegium Musicum. Prerequisite: MUSI 223 or equivalent. Admission by audition only. May be repeated for credit. For audition information see [www.yale.edu/oci](http://www.yale.edu/oci). HU RP

\* **MUSI 337b / THST 333b, Stephen Sondheim and the American Musical Theater Tradition** Daniel Egan

The musical theater of Stephen Sondheim, both as a popular phenomenon of the contemporary Broadway stage and in relation to models and forms employed in the past. HU RP

**MUSI 341b, Analysis of Mozart's Operas** Nathan Martin

Introduction to Mozart's later operas and to their analytical reception in American musicology and music theory of the twentieth and twenty-first centuries. The range and versatility of Mozart's operatic practice; the early development of opera analysis in the United States; ideological and historiographical agendas in more recent critique and the responses to them by subsequent writers. Prerequisite: MUSI 211. WR, HU RP

\* **MUSI 350b, History of Western Music: Middle Ages and Renaissance**

Anna Zayaruznaya

A detailed investigation of the history of musical style from A.D. 900 to 1600. Preference to Music majors according to class. HU

\* **MUSI 352a, History of Western Music: The Nineteenth and Twentieth Centuries**

James Hepokoski

A detailed investigation of the history of musical style from 1800 to the present. Preference to Music majors according to class. HU

**MUSI 357b / SAST 259b, Indian Music Theory and Practice** Stanley Scott

Introduction to the concepts and culture of music in South Asia from Vedic times to the present, with a focus on North Indian classical music. Discussion of history and theory is enriched by practical instruction and live performances. Topics include raga (melody), tala (meter), musical forms, improvisation, patronage, religion, and gender, with forays into folk music and film. No previous experience in Indian classical music required. HU

\* **MUSI 358a / CGSC 358a, Cognition of Musical Rhythm** Ève Poudrier

An introduction to the study of musical rhythm from the dual perspective of music theory and psychology. The nature of musical temporality explored through study of works from a variety of musical styles and through a survey of relevant experimental work on rhythm perception and production. Topics include cognitive limits on the perception of temporal structures; categorical perception and the role of memory; attention, entrainment, and sensorimotor synchronization; expressive timing; and complex rhythmic structures. HU

\* **MUSI 366b, Interpreting Gospel Music** Staff

The composition, performance, and reception of gospel music from its North American origins to contemporary global forms. Significant styles, songwriters, and performers; the use of music to express different social identities; gospel music as a reflection of economic, political, and religious change; the effects of migration, media, and missionary activities on the sound, meaning, and use of gospel music. HU

\* **MUSI 380a / ER&M 280a / GMAN 380a, Music in Nazi Germany**

Gundula Kreuzer

The interrelations between music and politics under the extreme conditions of a totalitarian regime. How the National Socialists sought to police all aspects of Germany's musical life between 1933 and 1945 and why they often failed. Topics include aesthetic, political, and administrative prerequisites for the Nazis' efforts; consequences of Nazism for musical culture during the Third Reich and beyond; and the vulnerability of music to ideological appropriation.

## Level IV

\* **MUSI 412a, Composition Seminar III** Konrad Kaczmarek

Advanced project-oriented studies in music composition and in the orchestration of chamber ensemble and chamber orchestra music. Survey of contemporary techniques in selected composers' works, as well as MIDI realization techniques in Logic Pro and East/West Orchestra. Prerequisites: MUSI 312 and 313. Admission by audition only. May be repeated for credit. Enrollment limited to 20. To audition, students should upload one or two PDF scores and MP3 recordings in a single zip file by 4 p.m. on Wednesday, September 3, to the designated 412 audition dropbox on the Composition Seminar Web page at [classesv2.yale.edu](http://classesv2.yale.edu). Students with questions should contact the instructor at [konrad.kaczmarek@yale.edu](mailto:konrad.kaczmarek@yale.edu).

\* **MUSI 413b, Composition Seminar IV** Kathryn Alexander

Advanced project-oriented studies in music composition and in the orchestration of symphonic orchestra music. Survey of contemporary techniques in selected composers' works, as well as MIDI realization techniques in Ableton Live 9 and VSL. Prerequisites: MUSI 312 AND 313. Admission by audition only. May be repeated for credit. Enrollment limited to 20. To audition, students should upload one or two PDF scores and MP3 recordings in a single zip file by 4 p.m. on Thursday, January 15, to the designated 413 audition dropbox on the Composition Seminar Web page at [classesv2.yale.edu](http://classesv2.yale.edu). Students with questions should contact the instructor at [kathryn.alexander@yale.edu](mailto:kathryn.alexander@yale.edu).

\* **MUSI 435b / HUMS 231b, Music in European Thought: Three Moments in the Modern Era** Leon Plantinga

An inquiry into the role of music and thought about music at three critical junctures in the intellectual and cultural history of modern Europe: the birth of modernity and opera; the Enlightenment and the classical style; and German romanticism and Beethoven. HU

\* **MUSI 449b, Schenkerian Perspectives in Structural Analysis** Ève Poudrier  
Introduction to the analysis of voice-leading structures in tonal music, using the concepts and tools of Schenkerian analysis. Focus on applications to works from the Western classical canon, from phrases and sections to entire pieces or movements, with some attention to noncanonical repertoires. The interaction of listening, analysis, and performance. Enrollment limited to Music majors. HU

#### SENIOR SEMINARS

\* **MUSI 463a, Arrangement and Transcription** Daniel Harrison  
Techniques of arrangement, transcription, and recomposition from the sixteenth century to the present studied from analytical, historical, and theoretical perspectives. RP

\* **MUSI 474b / THST 455b, French Baroque Spectacle** Rebekah Ahrendt  
Introduction to the major critical, performance, and historiographical issues associated with French lyric spectacle in the later seventeenth and early eighteenth centuries. Major plays, ballets, and operas by Molière, Corneille, Quinault, with music by Lully, Rameau, Campra, and others. Examination of historic and modern productions; use of original materials from Yale collections. Knowledge of French desirable but not required.

### Individual Study Courses

\* **MUSI 471a and MUSI 472b, Individual Study** Ian Quinn  
Original essay in ethnomusicology, music history, music theory, or music technology and/or multimedia art under the direction of a faculty adviser. Admission to the course upon submission to the department of the essay proposal by the registration deadline, and approval of the director of undergraduate studies.

\* **MUSI 490a and MUSI 491b, Senior Essay for Intensive Majors in the History, Theory, or Composition of Music** Ian Quinn  
Preparation of an original composition or essay under the direction of a faculty adviser. Music majors enroll for two terms; students in the music track of the Computing and the Arts major elect either term. Admission to the course upon submission to the department of the senior essay proposal by the fall registration deadline of the senior year, and approval of the director of undergraduate studies. Original composition project proposals also require an audition. Students intending to fulfill the requirements of the intensive major are urged to consult the director of undergraduate studies toward the end of the junior year.

### Individual Instruction in Performance

\* **MUSI 360a or b, Performance: First Term** Richard Gard  
Individual instruction in the study and interpretation of musical literature. Permission to take lessons for academic credit is granted to students who demonstrate an

appropriate level of proficiency in audition. Students taking MUSI 360 and 361 are required to be concurrently enrolled in a 200-level theory course (MUSI 205, 210, 211) for both terms, or they must complete one term of 200-level theory before enrolling in MUSI 360 and two terms of 200-level theory before enrolling in MUSI 361. All 200-level theory courses used to fulfill these prerequisites or corequisites must be taken for a letter grade. Students must take the Music Department's music theory placement test to determine their placement in the 200-level music theory sequence. A score of 4 or 5 on the Advanced Placement test in Music Theory does not satisfy the music theory prerequisites for performance instruction. Students register for the section specific to their instrument: see [www.yale.edu/oci](http://www.yale.edu/oci) for section information. Although the faculty of the School of Music attempts to accommodate those who qualify for credit instruction, it cannot guarantee that they will be enrolled with the teacher of their choice. Students who do not qualify for academic credit may also receive lessons. Students accepted for noncredit instruction are charged \$550 for ten hours of lessons per term or \$350 for six hours of lessons per term. The fees are added to the Student Financial Services bill and are not refundable after the first two weeks of lessons each term. Declared music majors in their junior or senior year may receive noncredit lessons at a discounted rate: six hours of lessons per term at no charge or ten hours of lessons per term for \$275. Auditions for assignment to instructors (for both credit and noncredit lessons) are required for freshmen and some returning students, and are held only at the beginning of the fall term. No auditions are held during the spring term. To arrange for an audition, students must sign up at <http://music.yale.edu/academics/lessons.html>.

**\* MUSI 361a or b, Performance: Second Term** Richard Gard

Continuation of MUSI 360. Enrollment requires previous completion of or concurrent registration in an additional required music theory course. Prerequisite: MUSI 360; after or concurrently with MUSI 210 or 211, as determined by the music theory placement test. Any 200-level theory course used to fulfill the prerequisite or corequisite must be taken for a letter grade.

**\* MUSI 460a or b, Performance: Third Term** Richard Gard

Continuation of MUSI 361. Prerequisite: MUSI 361.

**\* MUSI 461a or b, Performance: Fourth Term** Richard Gard

Continuation of MUSI 460. Prerequisite: MUSI 460. Students beyond their fourth term of performance instruction register first in MUS 540 in the School of Music, and then in MUS 640. No Yale College degree credit is offered for these courses.

## Naval Science

Program advisers: Commandant Keith Lanzer, USN, [keith.lanzer@yale.edu](mailto:keith.lanzer@yale.edu);  
Lieutenant Joshua Parsons, USN, [joshua.parsons@yale.edu](mailto:joshua.parsons@yale.edu); Rm. 430, 55 Whitney Ave., 432-8223; [nrotc.yalecollege.yale.edu](http://nrotc.yalecollege.yale.edu)

The Naval Reserve Officers Training Corps (NROTC) program educates and trains young men and women for service as commissioned officers in the United States Navy or Marine Corps. Candidates may apply for either the Scholarship Program or the nonscholarship College Program (see below) and choose either the Navy or the Marine option. Upon conferral of a degree, graduates of the NROTC Scholarship Program are commissioned into the Navy or Marine Corps for a minimum of five years of active

duty service. Graduates of the College Program are commissioned for a minimum of three years of active duty service.

**Academic requirements** The Naval Science curriculum includes courses on topics such as Navy and Marine Corps organization, at-sea navigation, leadership, naval history, amphibious warfare, engineering, and weapons systems. Courses emphasize development of professional knowledge and leadership skills, which are placed in the context of military service immediately following graduation from Yale College.

Students in the NROTC program enroll in one Naval Science course per term. Some courses are required for both Navy and Marine option students, while others are specific to the branch of service. All NROTC students must also enroll in the Naval Science Laboratory each term.

Prior to graduation, Navy option students must also complete eight core curriculum courses through Yale College in fields such as mathematics, physical science, history, and English. These courses count toward the bachelor’s degree, and many can be used to fulfill distributional requirements. For more information, visit the Yale NROTC Web site (<http://nrotc.yalecollege.yale.edu/academics>).

For the Navy option, the usual sequence of Naval Science courses is:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
Introduction to naval science	Sea power	Naval engineering	Naval operations
Navigation	Organizational leadership	Naval weapons systems	Leadership and ethics

For the Marine Corps option, the usual sequence of Naval Science courses is:

<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>	<b>Senior</b>
Introduction to naval science	Sea power	Evolution of warfare	Amphibious warfare
Elective	Organizational leadership	Elective	Leadership and ethics

**Application** Yale College students in their first or second year are eligible for enrollment in the NROTC program. Students who matriculate at Yale without a four-year NROTC scholarship may apply for enrollment in the nonscholarship College Program and compete for scholarships during their first two years. If selected for the Scholarship Program, students receive full tuition, academic fees, a stipend for textbooks, and a monthly subsistence allowance that increases annually. In addition to their involvement with the Naval ROTC program throughout the academic year, scholarship students attend a training cruise with a U.S. Navy or Marine Corps operational unit for approximately four weeks each summer.

Candidates apply for the national Naval ROTC scholarship on line via the national NROTC Web site (<http://www.nrotc.navy.mil>). Applications are due by January 31 for activation the following fall. For enrollment in the nonscholarship College Program, students apply directly to the Yale NROTC unit.

Yale’s Naval Reserve Officers Training Corps program is a member of a consortium of universities centered at the College of the Holy Cross in Worcester, Massachusetts. For

additional information about Yale's NROTC program, visit the program's Web site (<http://nrotc.yalecollege.yale.edu>) or send questions to [nrotc@yale.edu](mailto:nrotc@yale.edu).

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**\* NAVY 100a or b, Naval Science Laboratory** Staff

Leadership and practical application skills from the Professional Core Competency objectives that are not covered in other Naval Science courses. Emphasis on professional training that is not of an academic nature. Includes both classroom instruction and physical training. Topics and special briefings as determined by Naval Science faculty and the Naval Service Training Command. Required for NROTC students each term. Receives no credit; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors. o Course cr

**\* NAVY 111a, Introduction to Naval Science** Joshua Parsons

An overview of the naval service for first-year Naval ROTC students and others interested in pursuing the NROTC program. Organization, missions, customs and traditions, leadership principles, ethics, duties of a junior officer, and career options in the U.S. Navy and Marine Corps. Discussion of shipboard organization and procedures, safety, and damage control prepares students for summer training aboard naval vessels. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

**\* NAVY 112b, Navigation** Staff

Introduction to surface-ship navigation and practical piloting in both restricted and open water. Celestial navigation theory, navigational charts and instruments, and electronic navigation. Weather and other environmental factors that affect naval operations. Navigation rules and regulations, maneuvering board concepts, and practical exercises. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

**NAVY 212b, Leadership and Management** Staff

A study of leadership, ethics, resource management, and organizational behavior, with emphasis on situations commonly encountered by junior officers in the naval service. Classical theories of management, motivation, and communication; development of skills in organizational thinking and problem solving. Required for second-year NROTC students. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors. o Course cr

**NAVY 311a, Naval Engineering** Keith Lanzer

An overview of Naval engineering systems and a detailed study of the principles behind ship construction. Topics include ship design, hydrodynamic forces, stability, conventional and nuclear propulsion, electrical theory and systems, interior communications, damage control, hydraulics, and ship control. Basic concepts in the theory and design of steam, gas turbine, and diesel propulsion. o Course cr

**NAVY 312b, Naval Systems** Staff

The characteristics and capabilities of the major systems and platforms used in the U.S. Navy. Technical concepts and scientific theory addressed through study of designations, characteristics, capabilities, and missions of ships and aircraft. How computers and electronic and space-based communications influence operational employment of various naval platforms. Classic theory of radar, sonar, and fire-control systems. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors. o Course cr

**OTHER COURSES RELATED TO NAVAL SCIENCE****HIST 221a / GLBL 281a, Military History of the West since 1500** Paul Kennedy

A study of the military history of the West since 1500, with emphasis on the relationship between armies and navies on the one hand, and technology, economics, geography, and the rise of the modern nation-state on the other. The coming of airpower in its varied manifestations. Also meets requirements for the Air Force and Naval ROTC programs. HU

## Near Eastern Languages and Civilizations

Director of undergraduate studies: Benjamin Foster, 315 HGS, 432-6715,  
benjamin.foster@yale.edu; nelc.yale.edu

### FACULTY OF THE DEPARTMENT OF NEAR EASTERN LANGUAGES AND CIVILIZATIONS

**Professors** John Darnell, Benjamin Foster, Eckart Frahm, Dimitri Gutas, Bentley Layton, Harvey Weiss

**Associate Professor** Colleen Manassa

**Lecturers** Adel Allouche, Karen Foster, Kathryn Slanski

**Senior Lecturer II** Ayala Dvoretzky

**Senior Lectors** Sarab al-Ani, Muhammad Aziz, Aaron Butts, Moulay Youness Elbousty, Shiri Goren, Dina Roginsky, Farkhondeh Shayesteh

**Lectors** Etem Erol, Hasmik Tovmasyan

The major in Near Eastern Languages and Civilizations is a liberal arts major that gives students a sound competence in a Near Eastern language and a broad knowledge of the literatures, civilizations, history, and archaeology of the Near East. The major also provides essential preparation for graduate or professional work in which a knowledge of Near Eastern languages, history, and archaeology is required.

Depending on the student's interests, the major is built around study of one or more Near Eastern languages, leading to a concentration in the ancient Near East (Mesopotamia, Egypt, or Syria-Palestine), in Hebrew language and literature, or in Arabic and Islamic studies.

**Requirements of the major** Twelve term courses in the department, or their equivalent, are required for the major, including the senior essay course. No more than six course credits from other departments may be applied toward this requirement.

The course work includes at least two years of study of a Near Eastern language and no fewer than three courses in the history and civilizations of the Near East, at least one of which must be in the ancient and one in the Islamic Near East. Students should develop coherent programs of study in one of three areas of concentration:

1. Ancient Near Eastern languages and civilizations, with emphasis on Mesopotamia, Egypt, or Syria-Palestine. Students interested in Mesopotamia take at least two years of Akkadian, as well as courses in the history and civilizations of the ancient Near East. Students interested in Egypt take at least two years of Egyptian, as well as courses in the history and civilizations of ancient Egypt. Students interested in Syria-Palestine take at least two years of biblical Hebrew, as well as courses in the history and civilizations of the ancient Near East.
2. Hebrew language and literature. Students take two years or more of Hebrew (ancient or modern, but in any case at least two years of one period of the language), and courses in Hebrew literature, the history and civilizations of the ancient Near East, and Near Eastern Judaism.
3. Arabic and Islamic studies. ARBC 120 is a prerequisite for this area and counts as one term course toward the twelve required. Students take at least two years of Arabic beyond the prerequisite, and courses selected from Arabic literature, Arab civilization, Islamic religion, Near Eastern history, and Persian or Turkish language. In their senior year, students take NELC 490, Introduction to Arabic and Islamic Studies. Majors in this area of concentration are strongly advised to begin their language training as early as possible, and certainly not later than the sophomore year. Students should consult Dimitri Gutas, 316 HGS, 432-2947.

Well-qualified students who have acquired the requisite background in undergraduate courses may, with the permission of the instructor, the director of undergraduate studies, and the director of graduate studies, be admitted to graduate courses where no suitable undergraduate courses exist. In addition, courses from such other departments and programs as Archaeological Studies, History, History of Art, Judaic Studies, Political Science, and Religious Studies, as well as college seminars, are routinely accepted for credit toward the major if they deal with Near Eastern topics.

All course schedules must be approved by the director of undergraduate studies.

**Senior essay** To derive full benefit from the major, students should acquire practical experience in using Near Eastern languages for research purposes. Therefore all students in the major undertake a senior essay that involves substantial use of materials in one or more Near Eastern languages. The senior essay is a research paper of at least thirty pages prepared under the supervision of a departmental faculty member. It may be written under the rubric of NELC 492 and/or 493, or as an extended seminar paper in a departmental seminar course, in which case the instructor serves as the essay adviser. The topic and a prospectus signed by an adviser are to be submitted to the director of undergraduate studies by the end of the fourth week of classes in either term of the senior year. The particular subject matter and theoretical approach of the essay are decided by the student after consultation with the faculty adviser.

In cases in which students demonstrably need more time for an extensive essay, the senior essay may be approved as a year course after consultation with the adviser and the director of undergraduate studies. Only those students who have advanced



language skills and whose project is considered to be of exceptional promise are eligible. The requirements for the two-term essay are the same as for the one-term essay, except that the essay should be at least sixty pages.

Languages currently offered by the Department of Near Eastern Languages and Civilizations include Akkadian, Arabic, Egyptian, Hebrew, Persian, Syriac, and Turkish. Students who take a foreign language during a term, year, or summer abroad must complete a departmental placement examination after they return to Yale; there are no exceptions to this requirement.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** *Arabic and Islamic studies*—ARBC 120; *All other areas*—none

**Number of courses** 12 term courses (incl prereq and senior essay)

**Distribution of courses** 2 years of a Near Eastern lang; 3 courses in Near Eastern hist and civ, incl 1 in ancient and 1 in Islamic Near East; area of concentration as specified

**Specific course required** *Arabic and Islamic studies*—NELC 490

**Senior requirement** Senior essay using materials in 1 or more Near Eastern langs (in NELC 492 and/or 493 or in dept sem)

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## Near Eastern History and Civilizations

### INTRODUCTORY AND SURVEY COURSES

\* NELC 001b / ARCG 001b, **Egypt and Northeast Africa: A Multidisciplinary**

**Approach** John Darnell

Examination of approximately 10,000 years of Nile Valley cultural history, with an introduction to the historical and archaeological study of Egypt and Nubia. Consideration of the Nile Valley as the meeting place of the cultures and societies of northeast Africa. Various written and visual sources are used, including the collections of the Peabody Museum and the Yale Art Gallery. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

WR, HU

\* NELC 101a / HUMS 438a, **Origins of Western Civilization: The Near East from Alexander to Muhammad** Benjamin Foster

Cultural and historical survey of Hellenistic, eastern Roman, Parthian, Byzantine, and Sassanian empires in the Near East. Emphasis on mutual influences of Near Eastern and classical worlds, the rise of Christianity and Islam in Near Eastern contexts, and the division of East and West between conflicting ideas of unity. HU

### ANCIENT, CLASSICAL, AND MEDIEVAL

NELC 103a / ARCG 236a / HSAR 236a, **The Art of Ancient Palaces** Karen Foster  
Introduction to the art and architecture of palaces in ancient Egypt, Mesopotamia, and the Bronze Age Aegean. Special attention to palatial workshops (painting, sculpture, pottery, faience, glass, ivory, metal) in cultural context. Emphasis on the iconography of power, including the establishment within palatial complexes of the world's oldest botanical and zoological gardens. HU

**NELC 104b / ARCG 239b / HSAR 239b / HUMS 252b, Art of the Ancient Near East and Aegean** Karen Foster

Introduction to the art and architecture of Mesopotamia, Egypt, and the Aegean, with attention to cultural and historical contexts. HU

**NELC 112a / ARCG 222a / RLST 141a, Egyptian Religion through the Ages**  
John Darnell

Diachronic approach to topics in Egyptian religion. Religious architecture, evidence for protodynastic cults, foreigners in Egyptian religious celebrations, music and vocal expression in Egyptian religion, Re and Osiris, the Amarna interlude and the Ramesside solar religion, and the goddess of the eye of the sun. Readings in translation. HU

**NELC 121a / HUMS 441a, The Hero in the Ancient Near East** Kathryn Slanski  
Exploration of the interaction of religion, history, and literature in the ancient Near East through study of its heroes, including comparison with heroes, heroic narratives, and hero cults in the Bible and from classical Greece. WR, HU

**NELC 220b / ARCG 223b / WGSS 226b, Lives in Ancient Egypt** Colleen Manassa  
Introduction to the social history of ancient Egypt from 3,100 to 30 B.C.E. Focus on the lives of particular individuals attested in the textual and archaeological record, from pharaohs and queens to artists, soldiers, and farmers. Reading of primary sources in translation; course projects integrate ancient objects in Yale collections. HU

\* **NELC 230b / CLCV 113b / HUMS 434b, Mesopotamia's Literary Legacy**  
Kathryn Slanski

Major works of ancient Near Eastern literature; relationships with literary traditions in the Hebrew Bible and ancient Greece. Readings include myths, epics, wisdom literature, love poetry, and humorous stories. HU

\* **NELC 250b, Assyria: The First Near Eastern Empire** Eckart Frahm  
Survey of the history and culture of ancient Assyria, with a focus on its imperial phase in the first millennium B.C.E. Assyria's aggressive foreign policy; the role of the military; Assyrian royal ideology, religion, literature, art, and court life; Assyria's impact on the Bible; Assyria's image in classical sources. Readings from primary sources in translation. HU

**NELC 351b / CLCV 269b, Antiquity in Islam** Martin Devecka and Dimitri Gutas  
Historical and sociological study of the emergence of Islam in its late antique setting, as well as its links to the classical cultures of the Mediterranean, Near East, and Iranian plateau. HU

\* **NELC 403b / HIST 384Jb / MMES 172b, The Middle East between Crusaders and Mongols** Adel Allouche

The impact of the Crusades and the Mongol conquests on the Islamic Middle East. Political, social, and economic changes in the region from the eleventh century to the middle of the fourteenth. Emphasis on the rise of new dynasties as a result of changes in the ethnic mosaic of the Middle East. WR, HU

\* **NELC 404b / HIST 398Jb / MMES 173b, Mamluk Egypt** Adel Allouche  
A study of the Mamluks, manumitted slaves initially imported to Egypt for military service who established their own rule over Egypt and Syria (1250–1517). Focus on the structure and workings of the Mamluk state. Military, political, economic, and social

factors that contributed to the grandeur and, later, the decline of the Mamluk period in Egypt and its conquest by the Ottoman Turks. WR, HU

#### MODERN

**NELC 120a / ARCG 221a / HSAR 234a, Egyptomania** Colleen Manassa  
Conceptual underpinnings of the use of ancient Egyptian motifs in architecture, painting, sculpture, and decorative arts throughout western Europe, the Middle East, and North America from antiquity to the present. HU

**NELC 155a / JDST 323a / MMES 160a, State and Society in Israel** Dina Roginsky  
The interplay between the state and society in Israel. Current Israeli discourse on controversial issues such as civil rights in a Jewish-democratic state, Jewish-Arab relations, and right and left politics. Issues of orthodoxy, military service, globalization, and multiculturalism in Israel. Sociopolitical changes that have taken place in Israel since the establishment of the state in 1948 and that have led to the reshaping of Israeli Zionist ideology. HU

## Languages and Literatures of the Ancient Near East

#### AKKADIAN

Students wishing to study Akkadian should consult the director of undergraduate studies.

#### EGYPTIAN

**EGYP 110a, Introduction to Classical Hieroglyphic Egyptian I** Colleen Manassa  
Introduction to the language of ancient pharaonic Egypt (Middle Egyptian) and its hieroglyphic writing system, with short historical, literary, and religious texts. Grammatical analysis with exercises in reading, translation, and composition. Credit only on completion of EGYP 120. L1 RP

**EGYP 120b, Introduction to Classical Hieroglyphic Egyptian II** Colleen Manassa  
Continuation of EGYP 110. Prerequisite: EGYP 110. L2 RP

#### SYRIAC

Students wishing to study Syriac should consult the director of undergraduate studies.

## Hebrew Language and Literature

\* **HEBR 110a, Elementary Modern Hebrew I** Ayala Dvoretzky  
Introduction to the language of contemporary Israel, both spoken and written. Fundamentals of grammar; extensive practice in speaking, reading, and writing under the guidance of a native speaker. Credit only on completion of HEBR 120. L1 RP  
1½ Course cr

**HEBR 120b, Elementary Modern Hebrew II** Dina Roginsky  
Continuation of HEBR 110. Introduction to the language of contemporary Israel, both spoken and written. Fundamentals of grammar; extensive practice in speaking, reading, and writing under the guidance of a native speaker. Prerequisite: HEBR 110 or equivalent. L2 RP 1½ Course cr

\* **HEBR 130a, Intermediate Modern Hebrew I** Shiri Goren

Review and continuation of grammatical study, leading to a deeper understanding of style and usage. Focus on selected readings and on writing, comprehension, and speaking skills. Prerequisite: HEBR 120 or equivalent. L3 RP

**HEBR 140b, Intermediate Modern Hebrew II** Ayala Dvoretzky

Continuation of HEBR 130. Review and continuation of grammatical study leading to a deeper comprehension of style and usage. Focus on selected readings and on writing, comprehension, and speaking skills. Prerequisite: HEBR 130 or equivalent. L4 RP

\* **HEBR 158b / JDST 305b, Contemporary Israeli Society in Film** Shiri Goren

Examination of major themes in Israeli society through film, with emphasis on language study. Topics include migration, gender and sexuality, Jewish/Israeli identity, and private and collective memory. Readings in Hebrew and English provide a sociohistorical background and bases for class discussion. Prerequisite: HEBR 140 or permission of instructor. L5, HU RP

\* **HEBR 159a / JDST 409a / MMES 159a, Conversational Hebrew: Israeli Media**  
Shiri Goren

An advanced Hebrew course for students interested in practicing and enhancing conversational skills. Focus on listening comprehension and on various forms of discussion, including practical situations, online interactions, and content analysis. Prerequisite: HEBR 140 or permission of instructor. L5 RP

\* **HEBR 160a / JDST 360a / MMES 155a, Hebrew in a Changing World**

Dina Roginsky

Sociological aspects of Modern Hebrew as the language is used in Israel to construct norms, expectations, and daily experiences. Readings and class discussions address changes in Israeli society and culture at large. Prerequisite: HEBR 140. L5

## Arabic and Islamic Studies

### ARABIC

**ARBC 110a, Elementary Modern Standard Arabic I** Sarab Al Ani

Development of a basic knowledge of Modern Standard Arabic. Emphasis on grammatical analysis, vocabulary acquisition, and the growth of skills in speaking, listening, reading, and writing. Credit only on completion of ARBC 120. L1 RP  
1½ Course cr

**ARBC 120b, Elementary Modern Standard Arabic II** Sarab Al Ani

Continuation of ARBC 110. Prerequisite: ARBC 110 or requisite score on a placement test. L2 RP 1½ Course cr

\* **ARBC 130a, Intermediate Modern Standard Arabic I** Muhammad Aziz

Intensive review of grammar; readings from contemporary and classical Arab authors with emphasis on serial reading of unvoweled Arabic texts, prose composition, and formal conversation. Prerequisite: ARBC 120 or requisite score on a placement test. L3 RP 1½ Course cr

**ARBC 136a, Intermediate Classical Arabic I** Staff

Introduction to classical Arabic, with emphasis on analytical reading skills, grammar, and prose composition. Readings from the Qur'an, Islamic theology, and literature and history of the Middle East, as well as Jewish and Christian religious texts in Arabic.

Prerequisite: ARBC 120 or permission of instructor. May be taken concurrently with ARBC 130 or 150. L3 RP

**ARBC 140b, Intermediate Modern Standard Arabic II** Muhammad Aziz

Continuation of ARBC 130. Prerequisite: ARBC 130 or requisite score on a placement test. L4 RP 1½ Course cr

**ARBC 146b, Intermediate Classical Arabic II** Staff

Continuation of ARBC 136. Prerequisite: ARBC 136 or permission of instructor. May be taken concurrently with ARBC 140 or 151. L4 RP

\* **ARBC 150a, Advanced Modern Standard Arabic I** Youness Elbousty

Further development of listening, writing, and speaking skills. For students who already have a substantial background in Modern Standard Arabic. Prerequisite: ARBC 140 or requisite score on a placement test. L5 RP

\* **ARBC 151b, Advanced Modern Standard Arabic II** Youness Elbousty

Continuation of ARBC 150. Prerequisite: ARBC 150 or requisite score on a placement test. L5 RP

\* **ARBC 164b, North African Literature** Youness Elbousty

Close reading of selected works of North African fiction, drama, and poetry. Focus on contemporary texts from Morocco, Algeria, Tunisia, and Libya. Idiomatic expressions and structural patterns; selections from adapted movies. Prerequisite: ARBC 151 or requisite score on a placement test. L5, HU RP

\* **ARBC 165a or b / MMES 465a or b, Arabic Seminar** Dimitri Gutas

Study and interpretation of classical Arabic texts for advanced students. Prerequisite: ARBC 146, 151, or permission of instructor. May be repeated for credit. L5

**ARBC 193a, Moroccan Arabic** Youness Elbousty

A basic course in the Moroccan dialect of Arabic. Principles of grammar and syntax; foundations for conversation and listening comprehension. Prerequisite: ARBC 130 or equivalent. RP

\* **ARBC 471a, Directed Reading and Research** Dimitri Gutas

For students who wish to pursue a topic or body of texts not available in the department's regular curriculum. Approval of the plan of study is required from both the director of undergraduate studies and a member of the department who agrees to serve as instructor. Student and instructor meet regularly throughout the term. The course culminates in either a piece of written work or a final examination.

**PERSIAN**

**PERS 110a, Elementary Persian I** Farkhondeh Shayesteh

Introduction to modern Persian, with emphasis on all four language skills: reading, writing, listening, and speaking. Credit only on completion of PERS 120. L1 RP 1½ Course cr

**PERS 120b, Elementary Persian II** Farkhondeh Shayesteh

Continuation of PERS 110, with emphasis on all four language skills: reading, writing, listening, and speaking. Prerequisite: PERS 110 or permission of instructor. L2 RP 1½ Course cr

**PERS 130a, Intermediate Persian I** Farkhondeh Shayesteh

Continuation of PERS 120, with emphasis on expanding vocabulary and understanding more complex grammatical forms and syntax. Prerequisite: PERS 120 or permission of instructor. L3 RP 1½ Course cr

**PERS 140b, Intermediate Persian II** Farkhondeh Shayesteh

Continuation of PERS 130, with emphasis on expanding vocabulary and understanding more complex grammatical forms and syntax. Prerequisite: PERS 130 or permission of instructor. L4 RP 1½ Course cr

**\* PERS 151a, Persian Culture and Media** Farkhondeh Shayesteh

Advanced study of Persian grammar, vocabulary, and culture through the use of authentic Persian media. Examination of daily media reports on cultural, political, historical, and sporting events in Iran, Afghanistan, Tajikistan, and other Persian-speaking regions. Designed for nonnative speakers. Prerequisite: PERS 140 or permission of instructor. L5

**\* PERS 471a or b, Directed Reading in Persian**

Staff

Independent study of Persian texts at an advanced level.

**TURKISH****TKSH 110a, Elementary Modern Turkish I** Etem Erol

Development of a basic knowledge of modern Turkish, with emphasis on grammatical analysis, vocabulary acquisition, and reading and writing skills. Credit only on completion of TKSH 120. L1 RP 1½ Course cr

**TKSH 120b, Elementary Modern Turkish II** Etem Erol

Continuation of TKSH 110. Prerequisite: TKSH 110 or permission of instructor. L2 RP 1½ Course cr

**TKSH 130a, Intermediate Turkish I** Etem Erol

Continued study of modern Turkish, with emphasis on advanced syntax, vocabulary acquisition, and the beginnings of free oral and written expression. Prerequisite: TKSH 120 or permission of instructor. L3 RP

**TKSH 140b, Intermediate Turkish II** Etem Erol

Continuation of TKSH 130. Prerequisite: TKSH 130. L4 RP

**TKSH 151b, Advanced Turkish II** Etem Erol

Continuation of TKSH 150. Focus on primary materials from Turkish media, short stories, and Turkish films. Development of proficiency sufficient for conducting research and presenting findings and evaluations in Turkish. Prerequisite: TKSH 150. L5 RP

**\* TKSH 471a or b, Directed Reading and Research in Turkish** Staff

For students who wish to pursue a topic or body of texts not available in the department's regular curriculum. Approval of the plan of study is required from both the director of undergraduate studies and a member of the department who agrees to serve as instructor. Student and instructor meet regularly throughout the term. The course culminates in either a piece of written work or a final examination. RP

## Courses for Majors

### \* NELC 492a and NELC 493b, The Senior Essay Benjamin Foster

Preparation of a research paper of at least thirty pages (sixty pages for a two-term essay) under the supervision of a departmental faculty member, in accordance with the following schedule: (1) by the end of the second week of classes of the fall term, students meet with advisers to discuss the topic, approach, sources, and bibliography of the essay. Note: students planning to write the essay in the second term (NELC 493) should also meet with their prospective advisers by this deadline; (2) by the end of the fourth week of classes a prospectus with outline, including an annotated bibliography of materials in one or more Near Eastern languages and of secondary sources, is signed by the adviser and submitted to the director of undergraduate studies. The prospectus should indicate the formal title, scope, and focus of the essay, as well as the proposed research method, including detailed indications of the nature and extent of materials in a Near Eastern language that will be used; (3) at the end of the tenth week of classes (end of February for yearlong essays), a rough draft of the complete essay is submitted to the adviser; (4) two copies of the finished paper must be submitted to the director of undergraduate studies, 314 HGS, by 4 p.m. on the last day of reading period. Failure to comply with the deadline will be penalized by a lower grade. Senior essays will be graded by departmental faculty unless, for exceptional reasons, different arrangements for an outside reader are made in advance with the director of undergraduate studies and the departmental adviser.

### GRADUATE AND PROFESSIONAL SCHOOL COURSES OF INTEREST TO UNDERGRADUATES

Some Graduate School courses are open to qualified undergraduates with permission of the instructor and of the director of graduate studies. For course descriptions see the Online Course Information Web site (<http://www.yale.edu/oci>). (Also see "Courses in the Yale Graduate and Professional Schools" under "Special Arrangements" in the Academic Regulations.)

## Philosophy

Director of undergraduate studies: Daniel Greco, 106 C, 432-1659, [daniel.greco@yale.edu](mailto:daniel.greco@yale.edu); [philosophy.yale.edu](http://philosophy.yale.edu)

### FACULTY OF THE DEPARTMENT OF PHILOSOPHY

**Professors** Scyla Benhabib, David Charles, Stephen Darwall, Michael Della Rocca, Keith DeRose, Paul Franks, Tamar Gendler, John Hare, Karsten Harries, Verity Harte, Shelly Kagan, Joshua Knobe, Thomas Pogge, Scott Shapiro, Sun-Joo Shin, Steven Smith, Jason Stanley, Zoltán Szabó, Kenneth Winkler, Gideon Yaffe

**Assistant Professors** Daniel Greco, John Pittard, Bruno Whittle

**Lecturers** George Bealer, Gabriel Citron, Aaron Norby, Sam Shpall, Cecelia Watson

Philosophy courses numbered 100 through 199 are introductory. They are open to all students and have no prerequisites. Courses numbered 200 through 399 are intermediate. Some have prerequisites; others do not, and may be taken as a student's first course in philosophy, though such a student should consult the instructor first. In

general, it is a good idea to take a broadly based course in any area of philosophy before taking a specialized course.

Courses numbered 400 through 479 are seminars. These advanced courses are intended primarily for juniors and seniors, though other students may be admitted with the instructor's permission. Undergraduates should be sure they have enough background to take such a course, including previous work in the same area of philosophy. Students with questions should consult the instructor.

**The standard major** Prerequisite to the Philosophy major are two introductory or intermediate philosophy courses. The major requires twelve courses (including the prerequisites and the senior requirement) that collectively expose students to a wide range of philosophy and philosophers. The Philosophy curriculum is divided into three broad groups: history of philosophy (PHIL 125–174, 200–264, 400–424), metaphysics and epistemology (PHIL 265–319, 425–449), and ethics and value theory (PHIL 175–199, 320–399, 450–479). In history of philosophy, majors are required to take (a) either PHIL 125 and 126 or both terms of Directed Studies, and (b) an additional, third course in history of philosophy. Majors are encouraged to take PHIL 125 and 126 as early as possible; these courses may be taken in either order. Majors must complete two courses in metaphysics and epistemology, two courses in ethics and value theory, and a course in logic (such as PHIL 115), the last preferably by the fall of their junior year. Majors must also take two seminars and satisfy the senior requirement as described below.

All courses in Philosophy count toward the twelve-course requirement. With approval from the director of undergraduate studies, courses offered by other departments may be counted toward the major requirements, though no more than two such courses will normally be allowed.

Specific regulations for the group requirements are as follows:

1. Some introductory courses do not count toward any group requirement. Other courses count toward a group requirement unless they are otherwise designated.
2. Courses automatically count toward the group under which they are listed in this bulletin. In rare cases, a course will be designated as counting toward a second group, although no single course can be counted by the same student toward two group requirements. In addition, students may petition to have a course count toward a group other than the one under which it is listed in this bulletin, though the presumption will be against such petitions.
3. Courses taken in other departments and applied to the major will not normally count toward a group requirement. Students may petition for credit toward a group requirement, though the presumption will be against such petitions.

**Credit/D/Fail** No more than one course taken Credit/D/Fail may be counted toward the major, with the permission of the director of undergraduate studies.

**The senior requirement** The senior requirement is normally satisfied by completing a third philosophy seminar. Students taking a seminar to satisfy the senior requirement are expected to produce work superior in argument and articulation to that of a standard seminar paper. To this end, students taking a seminar for the senior requirement must satisfy additional requirements that are delineated in the syllabus or during the first class session, and that may include (a) additional readings, (b)



submission of a complete draft of the final paper by the eighth week of the term that will then be significantly revised, and (c) one-on-one or small-group meetings with the instructor to discuss class material, the additional readings, and drafts in preparation.

In special cases, students may meet the senior requirement through either a one-term or a two-term independent project supervised by an instructor (PHIL 490, 491). Students must petition to fulfill the senior requirement through an independent project, and approval is not guaranteed. Applicants must submit a proposal to the director of undergraduate studies, in consultation with an appropriate supervisor, by the end of the term prior to beginning the independent study.

Each major should, by October 1 of the junior year, secure the agreement of a member of the Philosophy department to serve as adviser for the year. The adviser aids the student in choosing courses and in planning for the senior year. All senior majors must have their schedules signed by the director of undergraduate studies.

**Psychology track** The psychology track is designed for students interested in both philosophy and psychology. Prerequisite to the major in the psychology track are two courses in philosophy or psychology. Majors in the track must take seven courses in philosophy and five in psychology, for a total of twelve, including the prerequisites and senior requirement. The seven philosophy courses must include (a) two courses in the history of philosophy, usually PHIL 125 and 126 or DRST 003 and 004, (b) a course in logic, such as PHIL 115, preferably by the fall of the junior year, (c) two seminars, one of which may be in the Psychology department, with the approval of the director of undergraduate studies, and (d) at least two courses at the intermediate or advanced level that bear on the intersection of philosophy and psychology, at least one of which must be a philosophy seminar. Courses satisfying (d) must be approved by the director of undergraduate studies. The five psychology courses must include PSYC 110 or its equivalent. Each major must also satisfy the senior requirement as described above for the standard major. No more than one course taken Credit/D/Fail may be counted toward the requirements of the major, with the permission of the director of undergraduate studies.

Students interested in philosophy and psychology should also consider the major in Cognitive Science (p. 202).

**Other majors involving philosophy** Majors in Mathematics and Philosophy (p. 500) and in Physics and Philosophy (p. 574) are also available.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** *Standard track*—any 2 intro or intermediate phil courses; *Psychology track*—any 2 courses in phil or psych

**Number of courses** *Both tracks*—12 term courses, incl prereqs and senior req

**Distribution of courses** *Standard track*—3 courses in hist of phil (incl DRST 003 and 004, or PHIL 125 and 126), 2 in metaphysics and epistemology, 2 in ethics and value theory, and 1 in logic; 2 phil sems; *Psychology track*—7 courses in phil, as specified; 5 courses in psych

**Specific courses required** *Standard track*—PHIL 125 and 126, or DRST 003 and 004; *Psychology track*—PSYC 110 or equivalent

**Senior requirement** *Both tracks*—a third sem in phil, or a one- or two-term independent project (PHIL 490, 491)

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## Introductory Courses

### \* PHIL 084b, **Philosophy and Psychology of Emotion** David Charles

Introduction to the interdisciplinary study of emotions, with a focus on philosophical works from antiquity to the present and on modern psychological and neuroscientific perspectives. The definition of emotions and their relation to reason, experience, and mood. The possibility of a general theory of the emotions. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

### PHIL 112a, **Problems of Philosophy** Daniel Greco

Exploration of perennial philosophical problems, including differences between knowledge and opinion, the objectivity or nonobjectivity of moral judgment, the nature of consciousness, the existence of God, the nature and possibility of free will, and how people remain the same over time as their bodily and psychological traits change. Readings from both classical and influential contemporary works. HU

### PHIL 115a, **First-Order Logic** Bruno Whittle

An introduction to formal logic. Study of the formal deductive systems and semantics for both propositional and predicate logic. Some discussion of metatheory. QR

## HISTORY OF PHILOSOPHY

### PHIL 125a / CLCV 125a, **Introduction to Ancient Philosophy** Verity Harte

An introduction to ancient philosophy, beginning with the earliest pre-Socratics, concentrating on Plato and Aristotle, and including a brief foray into Hellenistic philosophy. Intended to be taken in conjunction with PHIL 126. HU

### PHIL 126b, **Introduction to Modern Philosophy from Descartes to Kant**

Keith DeRose

An introduction to major figures in the history of modern philosophy, with critical reading of works by Descartes, Malabranche, Spinoza, Leibniz, Locke, Berkeley, Hume, and Kant. Intended to be taken in conjunction with PHIL 125, although PHIL 125 is not a prerequisite. HU

### PHIL 127a, **Faith and Reason** Keith DeRose and Julianne Chung

Topics related to the relationship between faith and reason, including what it means to take or believe something on faith, the rationality of faith and of belief in some kind of god, and whether religion must necessarily clash with science. Readings from works in both the Eastern and Western traditions. HU

## ETHICS AND VALUE THEORY

### PHIL 175a, **Introduction to Ethics** Shelly Kagan

What makes one act right and another wrong? What am I morally required to do for others? What is the basis of morality? These are some of the questions raised in moral philosophy. Examination of two of the most important answers, the theories of Mill and Kant, with brief consideration of the views of Hume and Hobbes. Discussion of the question: Why be moral? HU

EP&E: Intro Ethics

### PHIL 176b, **Death** Shelly Kagan

There is one thing I can be sure of: I am going to die. But what am I to make of that fact? An examination of a number of issues that arise once we begin to reflect on our

mortality. Consideration of the possibility that death may not actually be the end. Are we, in some sense, immortal? Would immortality be desirable? An attempt to get a clearer notion of what it is to die. And, finally, an evaluation of different attitudes to death. Is death an evil? Is suicide morally permissible? Is it rational? In short: how should the knowledge that I am going to die affect the way I live my life? Authors include Fischer, Perry, Plato, and Tolstoy. HU

**PHIL 182b / CGSC 282b / PSYC 182b, Perspectives on Human Nature** Joshua Knobe  
Comparison of philosophical and psychological perspectives on human nature. Nietzsche on morality, paired with contemporary work on the psychology of moral judgment; Marx on religion, paired with systematic research on the science of religious belief; Schopenhauer paired with social psychology on happiness. HU

## Intermediate Courses

### HISTORY OF PHILOSOPHY

**PHIL 204a, Kant's *Critique of Pure Reason*** Paul Franks  
An examination of the metaphysical and epistemological doctrines of Kant's *Critique of Pure Reason*. Prerequisite: PHIL 126 or DRST 004. HU

\* **PHIL 206a / RLST 210a, Nietzsche, Religion, and Modernity** Nancy Levene  
Exploration of Nietzsche's ideas on religion and of how his work is understood in a broader history inclusive of the present. Selections from several major works read in the context of shorter passages from Jewish and Christian scripture and from works by Immanuel Kant, with whom Nietzsche saw himself in dialogue. Questions of religion, modernity, and the nature of history expressive of both. HU

**PHIL 210b, Eastern Philosophy** Quang Phu Van  
An introduction to Eastern philosophy through the study of philosophical and religious texts. Topics include reality and illusion, knowledge, self, right and wrong, nonattachment, meditation, aesthetics, meaning of life, and death. HU

**PHIL 214a, The Philosophies of Hegel and Schelling** Paul Franks  
The competing versions of absolute idealism developed by Hegel and Schelling in the early 1800s. The relationships between philosophy and a history that culminates in modernity, and between philosophy and religion; the possibility of absolute knowledge and systematicity; the role of kabbalah in philosophy. HU

**PHIL 218b / CLCV 220b, Ancient Epistemology** Verity Harte  
Theories of knowledge of various philosophers and philosophical schools in antiquity, including Plato, Aristotle, the Stoics, the Epicureans, and the Sceptics. Prerequisite: PHIL 125 or DRST 003. HU

**PHIL 259a, Heidegger, Wittgenstein, and the Future of Philosophy** Karsten Harries  
Heidegger's and Wittgenstein's interpretations of language that call philosophy in the traditional sense into question. Analysis of certain presuppositions of those interpretations in an attempt to understand better what, if any, future still remains for philosophy. HU

## METAPHYSICS AND EPISTEMOLOGY

**PHIL 267b, Mathematical Logic** Sun-Joo Shin

An introduction to the metatheory of first-order logic, up to and including the completeness theorem for the first-order calculus. Introduction to the basic concepts of set theory. Prerequisite: PHIL 115 or permission of instructor. QR  
Math: Logic/Foundations

**PHIL 271b / LING 271b, Philosophy of Language** Bruno Whittle

An introduction to contemporary philosophy of language, organized around four broad topics: meaning, reference, context, and communication. Introduction to the use of logical notation. HU

**\* PHIL 272a, Philosophy of Mind** Aaron Norby

A survey of contemporary issues in the philosophy of mind, including arguments for and against materialism and accounts of intentional states, qualitative states, and mental causation. HU

**PHIL 315b, Truth and Relativism** Zoltán Szabó

Recent philosophical work on relativism and the relationship between truth and objectivity. The possibility of objective truth; rational disagreement; relativism and moral and scientific truth; bases for taking a stand on objectivity's limits. HU

## ETHICS AND VALUE THEORY

**PHIL 326b / RLST 402b, The Philosophy of Religion** John Hare

The relation between religion and ethics, traditional arguments for the existence of God, religious experience, the problem of evil, miracles, immortality, science and religion, and faith and reason. HU

**PHIL 334a / PLSC 281a / RLST 273a, Ethical and Social Issues in Bioethics**

Stephen Latham

A selective survey of issues in biomedical ethics. Comparison of different points of view about biomedical issues, including religious vs. secular and liberal vs. conservative. Special attention to issues in research and at the beginning and end of life. SO

## Seminars

## HISTORY OF PHILOSOPHY

**\* PHIL 400a / CLCV 429a, Aristotle's *Nicomachean Ethics*, Book VI**

Verity Harte and David Charles

Reading and discussion of the Greek text of Aristotle's *Nicomachean Ethics*, Book VI, in which Aristotle characterizes the intellectual virtues and offers his most complete account of various forms of skill and knowledge. Prerequisites: GREK 131, 141, and PHIL 125 or equivalents, or with permission of the instructors. L5, HU

**\* PHIL 409b, Aristotle and the Mind/Body Relationship** David Charles

Aristotle's discussion of psychological phenomena such as emotions, desire, perception, and thought. Whether his way of thinking about such phenomena challenges post-Cartesian understandings of the relationship between the human mind and body. HU

**\* PHIL 411a, Early Modern Philosophy of Language**

Zoltán Szabó and Kenneth Winkler

Early modern contributions to the philosophy of language. Topics include the nature of signs, ideas as sources of meaning, the formation of propositions, truth, necessary

truth, inference, and logical form. Readings from works by Arnauld and Nicole, Locke, Leibniz, and Berkeley; contemporary philosophical reception in the writings of Chomsky, Davidson, and their critics. HU

\* **PHIL 412a / GMAN 211a / HUMS 311a, Marx, Nietzsche, Freud** Rüdiger Campe  
The revolutionary ways in which Marx, Nietzsche, and Freud redefined the ends of freedom. Key works of the three authors on agency in politics, economics, epistemology, social life, and sexuality. Agency as individual or collective, as autonomous or heteronomous, and as a case of liberation or subversion. Additional readings from Kant, Hegel, Kierkegaard, and Weber. HU

#### METAPHYSICS AND EPISTEMOLOGY

\* **PHIL 425a, Topics in Epistemology** Daniel Greco  
Survey of recent work in epistemology, with an emphasis on connections between formal approaches to epistemology and traditional epistemological questions. Bayesian approaches and their limitations; the relationship of credence to belief and knowledge; higher-order knowledge and probability. Prerequisite: a course in epistemology, or with permission of instructor. HU

\* **PHIL 426a, The Cognitive Science of Morality** Joshua Knobe  
Introduction to the emerging field of moral cognition. Focus on questions about the philosophical significance of psychological findings. Topics include the role of emotion in moral judgment; the significance of character traits in virtue ethics and personality psychology; the reliability of intuitions and the psychological processes that underlie them. HU

\* **PHIL 427b, Computability and Logic** Sun-Joo Shin  
A technical exposition of Gödel's first and second incompleteness theorems and of some of their consequences in proof theory and model theory, such as Löb's theorem, Tarski's undefinability of truth, provability logic, and nonstandard models of arithmetic. Prerequisite: PHIL 267 or permission of instructor. QR, HU  
Math: Logic/Foundations

\* **PHIL 437b, Philosophy of Mathematics** Bruno Whittle  
Metaphysical and epistemological issues raised by mathematics. Questions concerning the notion of a set, whether one can quantify absolutely everything, and whether there are really infinite sets of different sizes; the significance of Gödel's incompleteness theorems; arguments designed to show that certain mathematical terms are referentially indeterminate. HU

#### ETHICS AND VALUE THEORY

\* **PHIL 450b, The Problem of Evil** Keith DeRose and John Pittard  
The challenge that evil's existence in the world poses for belief in a perfectly good and omnipotent God. The main formulations of the problem of evil; proposed ways of solving or mitigating the problem and criticism of those solutions. Skeptical theism, the free-will defense, soul-making theodicies, and doctrines of hell. HU

\* **PHIL 451a, Beyond the God Hypothesis** Gabriel Citron  
Reasons why many theologians have considered it misguided to understand religious faith as a hypothesis about the existence of a superempirical entity. Modern Christian and Jewish attempts to reenvision what faith might be if not a hypothesis and what

God might be if not an entity. Possibilities for religious life in the context of this reenvisioned theism. HU

\* **PHIL 455a / EP&E 334a, Normative Ethics** Shelly Kagan

A systematic examination of normative ethics, the part of moral philosophy that attempts to articulate and defend the basic principles of morality. The course surveys and explores some of the main normative factors relevant in determining the moral status of a given act or policy (features that help make a given act right or wrong). Brief consideration of some of the main views about the foundations of normative ethics (the ultimate basis or ground for the various moral principles). Prerequisite: a course in moral philosophy. HU

\* **PHIL 459b, Political Theory** Scott Shapiro

A survey of classic works in modern political theory from the fifteenth century to the twentieth. Focus on the philosophical value of texts not usually read by philosophers. Authors include Machiavelli, Grotius, Montesquieu, Burke, de Tocqueville, Schmitt, Arendt, and Foucault. HU

\* **PHIL 461b / AFAM 269b / EP&E 458b / PLSC 315b, Egalitarianism**

Christopher Lebron

The concept of equality in normative political theory explored through contemporary philosophical texts. Reasons why oppressed, marginalized, and systematically disadvantaged groups express their claims in terms of equality; racial inequality as a case study. SO

\* **PHIL 465a / EP&E 480a, Recent Work in Ethical Theory** Stephen Darwall

A study of recently published works on ethics and its foundations. Issues include the grounds of normativity and rightness and the role of the virtues. HU

## Tutorial and Senior Essay Courses

\* **PHIL 480a or b, Tutorial** Daniel Greco

A reading course supervised by a member of the department and satisfying the following conditions: (1) the work of the course must not be possible in an already existing course; (2) the course must involve a substantial amount of writing, i.e., a term essay or a series of short essays; (3) the student must meet with the instructor regularly, normally for at least an hour a week; (4) the proposed course of study must be approved by both the director of undergraduate studies and the instructor.

\* **PHIL 490a and PHIL 491b, The Senior Essay** Daniel Greco

The essay, written under the supervision of a member of the department, should be a substantial paper; a suggested length is between 8,000 and 12,000 words for one-term projects, and between 12,500 and 15,000 words for two-term projects. Students completing a one-term project should enroll in either 490 in the fall or 491 in the spring. Students completing a two-term project should enroll in both 490 and 491. The deadline for senior essays completed in the fall is December 5; the deadline for both one- and two-term senior essays completed in the spring is April 20.

## GRADUATE, DIVINITY, AND LAW SCHOOL COURSES THAT COUNT TOWARD THE MAJOR

Some Graduate, Divinity, and Law School courses are open to qualified undergraduates with permission of the instructor and the director of graduate studies or the dean or

registrar of the Divinity or the Law School. (See "Courses in the Yale Graduate and Professional Schools" in section K of the Academic Regulations.) With permission of the director of undergraduate studies, relevant Graduate, Divinity, and Law School courses may count toward the major. Course descriptions appear in the Graduate, Divinity, and Law School bulletins.

## Physics

Director of undergraduate studies: John Harris, 311 WL-W, 432-3601, [dus.physics@yale.edu](mailto:dus.physics@yale.edu); [physics.yale.edu/academics/undergraduate-studies](http://physics.yale.edu/academics/undergraduate-studies)

### FACULTY OF THE DEPARTMENT OF PHYSICS

**Professors** † Charles Ahn, Yoram Alhassid, Thomas Appelquist, † Charles Bailyn, O. Keith Baker, Charles Baltay, Sean Barrett, Cornelius Beausang (*Adjunct*), † Hui Cao, Richard Casten, † Richard Chang (*Emeritus*), † Paolo Coppi, David DeMille, † Michel Devoret, Bonnie Fleming, † Paul Fleury, Moshe Gai (*Adjunct*), † Marla Geha, Steven Girvin, Leonid Glazman, Martin Gutzwiller (*Adjunct*), John Harris, Karsten Heeger, † Victor Henrich, Jay Hirshfield (*Adjunct*), † Jonathon Howard, Francesco Iachello, Steven Lamoreaux, William Marciano (*Adjunct*), Daniel McKinsey, Simon Mochrie, Vincent Moncrief, † Priyamvada Natarajan, Peter Parker (*Emeritus*), † Daniel Prober, Nicholas Read, Jack Sandweiss (*Emeritus*), † Robert Schoelkopf, Ramamurti Shankar, Witold Skiba, † A. Douglas Stone, Paul Tipton (*Chair*), † John Tully, Thomas Ullrich (*Adjunct*), C. Megan Urry, † Pieter van Dokkum, † John Wettlaufer, Michael Zeller (*Emeritus*)

**Associate Professors** Helen Caines, Sarah Demers, † Eric Dufresne, † Thierry Emonet, Walter Goldberger, Tobias Golling, Jack Harris, † Sohrab Ismail-Beigi, Daisuke Nagai, † Corey O'Hern, Nikhil Padmanabhan, † A. Elizabeth Rhoades

**Assistant Professors** Sarah Demers, Tobias Golling, † Liang Jiang, Reina Maruyama, David Poland, † Peter Rakich

**Senior Lecturer** Sidney Cahn

**Lecturers** Stephen Irons, Rona Ramos, † Frank Robinson

† A joint appointment with primary affiliation in another department.

Physics forms a foundation for all other sciences. The various undergraduate courses and degree programs offered by the Physics department provide students with a thorough preparation in physics for any career, as well as the general background in physics that should be part of a liberal education. The department offers four different introductory sequences and two degree programs. The department also offers a variety of introductory courses for non-science majors to fulfill SC or QR credit. Combined majors are available in Mathematics and Physics (p. 501), Astrophysics (p. 161), Physics and Philosophy (p. 574), and Physics and Geosciences (p. 573). Applied Physics (p. 134) is a closely related major.

**Introductory courses with no calculus requirement** Physics courses numbered 120 or below are for students with little or no previous experience in physics who do not plan to major in the natural sciences. These courses have no college-level mathematics requirement and do not satisfy the medical school requirement.

**Introductory calculus-based lecture sequences**

1. PHYS 170, 171 is for students with little background in physics and mathematics who will probably not major in the physical sciences but who may be interested in the medical and biological sciences. There is no mathematics prerequisite other than high school mathematics, but MATH 112 and 115 should be taken concurrently.
2. PHYS 180, 181 is for students with some previous background in physics and mathematics who plan to major in the physical sciences. Calculus at the level of MATH 112 is a prerequisite; MATH 115 and 120 should be taken concurrently.
3. PHYS 200, 201 is for students with a strong background in mathematics and physics who plan to major in the physical sciences. Calculus at the level of MATH 115 is presumed. MATH 120 should be taken concurrently with PHYS 200. It is suggested that MATH 222 or 225 be taken concurrently with PHYS 201.
4. PHYS 260, 261 is intended for students who have had excellent training in and have a flair for mathematical methods and quantitative analysis; a solid foundation in physics is required. MATH 230, 231 or the equivalent should be taken concurrently with PHYS 260, 261.

If students have the appropriate mathematics background, they are advised to take a calculus-based physics course. Sir Isaac Newton developed calculus while trying to describe the world around him; it is the natural language of physics. Students enrolled in one of the calculus-based introductory courses will be invited to a series of Chairman's Teas, which provide an opportunity to discuss topics on the frontiers of physics with faculty and peers. Completion of a calculus-based course also prepares students for the 340-level series of advanced physics electives, which cover special topics of interest to both majors and nonmajors.

PHYS 170, 180, 200, and 260 meet at the same time so that students are easily able to change levels if necessary. Questions about placement should be addressed to the director of undergraduate studies.

**Introductory laboratories** Two different introductory laboratory sequences are offered: PHYS 165L, 166L, and PHYS 205L, 206L. Each of these laboratory courses earns one-half course credit. Students normally take the laboratory courses associated with the introductory physics sequence in which they are enrolled. Students should register for a section of the appropriate laboratory course during the first week of classes by logging onto Classes\*v2 (<http://classesv2.yale.edu>).

1. PHYS 165L, 166L is an introductory laboratory for students without a strong high school physics laboratory preparation. Related lecture courses are PHYS 170, 171, and PHYS 180, 181.
2. PHYS 205L, 206L is for students who plan to major in the physical sciences. Related lecture courses are PHYS 180, 181, PHYS 200, 201, and PHYS 260, 261. Students who take the lecture courses in freshman year are advised to start this laboratory sequence with PHYS 205L in the spring of freshman year or in the fall of sophomore year.

**Advanced electives** A series of 340-level electives explores special topics of interest to both majors and nonmajors. The electives are open to any student in Yale College who has completed a year of introductory calculus-based physics (PHYS 170, 171, or



180, 181, or 200, 201, or 260, 261). The offerings for 2014–2015 include PHYS 342, Introduction to Earth and Environmental Physics; PHYS 343, Gravity, Astrophysics, and Cosmology; and PHYS 344, Quantum and Nanoscale Physics.

**Major degree programs** Two different majors are offered in Physics: the B.S. and the B.S. with an intensive major. Students in either program acquire advanced training in physics, mathematics, and related topics through the core courses. They use electives to design individualized programs with more depth or breadth, depending on their needs and interests. Both degree programs require research experience through PHYS 471 and 472—one term for the B.S. degree and two terms for the B.S. degree with an intensive major. Both programs are excellent preparation for a wide variety of postgraduate activities, including professional school in business, law, or medicine; graduate school in engineering or other sciences; or careers in business, consulting, financial services, government service, or teaching.

The B.S. program with an intensive major is distinguished by depth of study in advanced physics courses and prepares students to study physics or closely related physical sciences in graduate school. The director of undergraduate studies can help students in the B.S. program prepare for graduate school in physics by recommending appropriate electives to supplement the core courses.

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the requirements of either major.

**B.S. degree program** The prerequisites are an introductory lecture course sequence with a mathematics sequence equivalent to, or more advanced than, the corequisite of the physics sequence. The following options are appropriate: PHYS 170, 171 with MATH 112, 115; or PHYS 180, 181 with MATH 115, 120; or PHYS 200, 201 with MATH 120 and either 225 or 222; or PHYS 260, 261 with MATH 230, 231 or equivalent. In addition, the laboratory sequence PHYS 205L, 206L or PHYS 165L, 166L is required. Students who take these physics and mathematics courses starting in their freshman year may satisfy the prerequisites by the middle of their sophomore year. Students who begin taking physics courses in their sophomore year may also complete either the standard or the intensive major. Students are advised to take mathematics courses throughout their freshman year at the appropriate level.

Eight courses are required beyond the prerequisites, including the senior project. Students must take a mathematics course at the level of, or more advanced than, PHYS 301. Three courses at the core of the major involve advanced study of fundamental topics common to all branches of physics, and must be taken in order. The first two, PHYS 401 and 402, pertain to advanced classical physics (mechanics, statistical physics and thermodynamics, and electromagnetism), and the third, APHY 439 or PHYS 440, covers quantum mechanics. Three advanced elective courses are also required. Suitable advanced courses include the PHYS 340-level electives, an advanced laboratory such as PHYS 382L, and 400-level courses in Physics. Students may also find suitable advanced courses in other departments in the sciences, engineering, and mathematics. Courses taken to satisfy these requirements must be approved by the director of undergraduate studies. In order to pursue their individual interests in sufficient depth, many students choose to take more than the required number of advanced courses.

**Senior requirement for the B.S. degree program** The senior requirement for the regular B.S. degree is fulfilled by receiving a passing grade on a one-term research project in PHYS 471 or 472 or equivalent. Students should consult the director of undergraduate studies for further information.

**B.S. degree program, intensive major** The prerequisites for the B.S. degree with an intensive major are the same as for the standard program. Ten courses are required beyond the prerequisites, including the senior project. Students must take a mathematics course at the level of, or more advanced than, PHYS 301. Five courses at the core of the major involve advanced study of fundamental topics common to all branches of physics. Three of the courses pertain to advanced classical physics: mechanics (PHYS 410), statistical physics and thermodynamics (PHYS 420), and electromagnetism (PHYS 430). Two other courses incorporate quantum mechanics (PHYS 440 and 441). These courses must be taken in order because the ideas build progressively: PHYS 410 precedes 440, which precedes 441, 420, and 430.

Because experiment is at the heart of the discipline, the intensive major requires one term of advanced laboratory (PHYS 382L or equivalent) and at least two terms of independent research (PHYS 471, 472 or equivalent). One advanced elective course is required to complete the program. Suitable advanced courses include the PHYS 340-level electives and 400-level courses in Physics. Students may also find suitable advanced courses in other departments in the sciences, engineering, and mathematics. Courses taken to satisfy these requirements must be approved by the director of undergraduate studies. In order to pursue their individual interests in sufficient depth, many students choose to take more than ten advanced courses.

**Senior requirement for the B.S. degree program, intensive major** The senior requirement for the intensive major is fulfilled by receiving a passing grade on a two-term research project in PHYS 471, 472 or equivalent. Students should consult the director of undergraduate studies for further information.

**Sequence of courses** For both the regular B.S. degree and the B.S. degree with an intensive major, students are advised to begin the program in their freshman year to allow the greatest amount of flexibility in course selection. It is possible, however, to complete either program in a total of six terms, as illustrated below.

A program for a student completing the Physics B.S. in three years might be:

<b>Freshman or Sophomore</b>	<b>Sophomore or Junior</b>	<b>Senior</b>
PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261	PHYS 206L	APHY 439 or PHYS 440
PHYS 205L	PHYS 301	PHYS 471 or 472
Mathematics corequisites	PHYS 401	Two advanced electives
	PHYS 402	
	One advanced elective	

A program for a student completing the intensive major in three years might be:

<b>Freshman or Sophomore</b>	<b>Sophomore or Junior</b>	<b>Senior</b>
PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261	PHYS 206L	PHYS 441
PHYS 205L	PHYS 301	PHYS 420
Mathematics corequisites	PHYS 410	PHYS 430
	PHYS 440	PHYS 471
	PHYS 382L	PHYS 472
		One advanced elective

**Approval of programs** All Physics majors in the sophomore, junior, and senior classes must have their programs approved by the director of undergraduate studies. Freshmen and undeclared sophomores who are interested in Physics or related majors are encouraged to meet with the director of undergraduate studies to discuss their questions and proposed programs.

#### REQUIREMENTS OF THE MAJOR

##### B.S. DEGREE

**Prerequisites** PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, with appropriate math coreqs; PHYS 205L, 206L, or PHYS 165L, 166L

**Number of courses** 8 term courses beyond prereqs (incl senior req)

**Specific courses required** PHYS 301 or other advanced math course; PHYS 401, 402, and either APHY 439 or PHYS 440, in sequence

**Distribution of courses** 3 advanced electives approved by DUS

**Senior requirement** PHYS 471 or 472 or equivalent

##### B.S. DEGREE, INTENSIVE MAJOR

**Prerequisites** PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, with appropriate math coreqs; PHYS 205L, 206L, or PHYS 165L, 166L

**Number of courses** 10 term courses beyond prereqs (incl senior req)

**Specific courses required** PHYS 301 or other advanced math course; PHYS 410, 440, 441, 420, 430, in sequence; PHYS 382L

**Distribution of courses** 1 advanced elective approved by DUS

**Senior requirement** PHYS 471 and 472 or equivalent

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## Courses

\* **PHYS 050b / APHY 050b, Science of Modern Technology** Daniel Prober  
Examination of the science behind selected advances in modern technology. Focus on the scientific and contextual basis of each advance. Topics are developed by the participants with the instructor and with guest lecturers, and may include nanotechnology, quantum computation and cryptography, optical systems for communication and medical diagnostics, transistors, satellite imaging and global positioning systems, large-scale immunization, and DNA made to order. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

SC RP

**\* PHYS 100a / APHY 100a / ENAS 100a / EVST 100a / G&G 105a, Energy Technology and Society** Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non–science majors with strong backgrounds in math and science. Enrollment limited to 24. For application instructions, visit the course site on Classes\*v2 (<http://classesv2.yale.edu>). QR, SC

**\* PHYS 101b, Movie Physics** Francis Robinson

A critical evaluation of Hollywood action movies, using the laws of physics and Fermi-type estimation techniques to distinguish between fictional and real movie physics. Enrollment limited to freshmen and sophomores. QR, SC

**\* PHYS 112a, Practical Electronics** Stephen Irons

Basic theory and practical applications of electricity and electronics, with an emphasis on useful and creative applications. The basic laws of electricity, household electricity and its generation, passive and active electrical components, simple circuit design, and programmable microprocessors and the Arduino platform. Students design, build, and analyze simple electronic devices.

**\* PHYS 120b, Quantum Physics and Beyond** John Harris

Current topics in modern physics, beginning with quantum physics and continuing through subatomic physics, special and general relativity, cosmology, astrophysics, and string theory. SC

**PHYS 165La and PHYS 166Lb, General Physics Laboratory** Staff

A variety of individually self-contained experiments are roughly coordinated with the lectures in PHYS 170, 171, and 180, 181 and illustrate and develop physical principles covered in those lectures. SC ½ Course cr per term

**\* PHYS 170a and PHYS 171b, University Physics for the Life Sciences** Staff

An introduction to classical physics with special emphasis on applications drawn from the life sciences and medicine. Fall-term topics include vectors, kinematics, Newton's laws of motion, oscillations and waves, gravitation, elasticity, statics, diffusion, fluids, and thermodynamics. Spring-term topics include electricity and magnetism, circuits, light and optics, sound, and modern physics. Essential calculus is introduced as needed. Concurrently with MATH 112, 115. See comparison of introductory sequences and laboratories in the YCPS. QR, SC

**PHYS 180a and PHYS 181b, University Physics** Staff

A broad introduction to classical and modern physics for students who have some previous preparation in physics and mathematics. Fall-term topics include Newtonian mechanics, gravitation, waves, and thermodynamics. Spring-term topics include electromagnetism, optics, special relativity, and quantum physics. Concurrently with MATH 115 and 120 or equivalents. See comparison of introductory sequences and laboratories in the YCPS. May not be taken for credit after PHYS 170, 171. QR, SC

**PHYS 200a and PHYS 201b, Fundamentals of Physics** Staff

A thorough introduction to the principles and methods of physics for students who have good preparation in physics and mathematics. Emphasis on problem solving and quantitative reasoning. Fall-term topics include Newtonian mechanics, special relativity, gravitation, thermodynamics, and waves. Spring-term topics include electromagnetism, geometrical and physical optics, and elements of quantum mechanics. Prerequisite:

MATH 115 or equivalent. See comparison of introductory sequences and laboratories in the YCPS. QR, SC

**PHYS 205La or b and PHYS 206La or b, Modern Physical Measurement** Staff

A two-term sequence of experiments in classical and modern physics for students who plan to major in Physics. In the first term, the basic principles of mechanics, electricity, and magnetism are illustrated in experiments designed to make use of computer data handling and teach error analysis. In the second term, students plan and carry out experiments illustrating aspects of wave and quantum phenomena and of atomic, solid state, and nuclear physics using modern instrumentation. May be begun in either term. May be begun in either term. SC ½ Course cr per term

**\* PHYS 260a and PHYS 261b, Intensive Introductory Physics** Charles Baltay

The major branches of physics – classical and relativistic dynamics, gravitation, electromagnetism, heat and thermodynamics, statistical mechanics, quantum physics – at a sophisticated level. For students majoring in the physical sciences, Mathematics, and Philosophy who have excellent training in and a flair for mathematical methods and quantitative analysis. Concurrently with MATH 230 and 231, or PHYS 301, or equivalent. QR, SC

**PHYS 301a, Introduction to Mathematical Methods of Physics** Nikhil Padmanabhan

Topics include multivariable calculus, linear algebra, complex variables, vector calculus, and differential equations. Designed to give accelerated access to 400-level courses by providing, in one term, the essential background in mathematical methods. Recommended to be taken concurrently with PHYS 401 or 410. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. QR

**PHYS 342a, Introduction to Earth and Environmental Physics** Steve Lamoreaux

A broad introduction to the physical, chemical, and biological processes that affect the climate and other features of the Earth. Emphasis on anthropogenic activity that affects the environment; attention to issues of energy extraction from natural resources and subsequent waste disposal. Recommended preparation: familiarity with basic calculus. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. QR, SC

**PHYS 343b, Gravity, Astrophysics, and Cosmology** Nikhil Padmanabhan

In-depth discussion of the physics underlying several recent discoveries in astrophysics and cosmology, including extrasolar planets, black holes, and the accelerating universe. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. QR, SC

**PHYS 344b, Quantum and Nanoscale Physics** Sean Barrett

An introduction to cutting-edge developments in physics involving quantum information and/or nanotechnology. Background concepts in quantum mechanics, electromagnetism, and optics are introduced as necessary. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. PHYS 301 or other advanced mathematics course recommended. QR, SC

**\* PHYS 382Lb, Advanced Physics Laboratory** Steve Lamoreaux

Laboratory experiments with some discussion of theory and techniques. An advanced course focusing on modern experimental methods and concepts in atomic, optical, nuclear, and condensed matter physics. Intended to prepare students for independent

research. For majors in the physical sciences. Prerequisite: PHYS 206L. After or concurrently with PHYS 439 or 440, or with permission of instructor. SC

**PHYS 401a and PHYS 402b, Advanced Classical Physics from Newton to Einstein**  
Staff

Advanced physics as the field developed from the time of Newton to the age of Einstein. Topics include mechanics, electricity and magnetism, statistical physics, and thermodynamics. The development of classical physics into a "mature" scientific discipline, an idea that was subsequently shaken to the core by the revolutionary discoveries of quantum physics and relativity. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261. Concurrently with PHYS 301 or other advanced mathematics course. QR, SC

**PHYS 410a, Classical Mechanics** David Poland

An advanced treatment of mechanics, with a focus on the methods of Lagrange and Hamilton. Lectures and problems address the mechanics of particles, systems of particles, and rigid bodies, as well as free and forced oscillations. Introduction to chaos and special relativity. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261. Concurrently with PHYS 301 or other advanced mathematics course. QR, SC

\* **PHYS 420a, Thermodynamics and Statistical Mechanics** A. Douglas Stone

An introduction to the laws of thermodynamics and their theoretical explanation by statistical mechanics. Applications to gases, solids, phase equilibrium, chemical equilibrium, and boson and fermion systems. Prerequisites: PHYS 301 and 410 or equivalents. QR, SC

**PHYS 428a / AMTH 428a / E&EB 428a / G&G 428a, Science of Complex Systems**

Jun Korenaga

Introduction to the quantitative analysis of systems with many degrees of freedom. Fundamental components in the science of complex systems, including how to simulate complex systems, how to analyze model behaviors, and how to validate models using observations. Topics include cellular automata, bifurcation theory, deterministic chaos, self-organized criticality, renormalization, and inverse theory. Prerequisite: PHYS 301, MATH 247, or equivalent. QR, SC

**PHYS 430b, Electromagnetic Fields and Optics** David DeMille

Electrostatics, magnetic fields of steady currents, electromagnetic waves, and relativistic dynamics. Provides a working knowledge of electrodynamics. Prerequisites: PHYS 301 and 410 or equivalents. QR, SC

**PHYS 440b, Quantum Mechanics and Natural Phenomena I** Daniel McKinsey

The first term of a two-term sequence covering principles of quantum mechanics with examples of applications to atomic physics. The solution of bound-state eigenvalue problems, free scattering states, barrier penetration, the hydrogen-atom problem, perturbation theory, transition amplitudes, scattering, and approximation techniques. Prerequisite: PHYS 410 or 401. QR, SC

**PHYS 441a, Quantum Mechanics and Natural Phenomena II** Daisuke Nagai

Continuation of PHYS 440. Prerequisite: PHYS 440. QR, SC

**PHYS 448a / APHY 448a, Solid-State Physics I** Victor Henrich

The first term of a two-term sequence covering the principles underlying the electrical, thermal, magnetic, and optical properties of solids, including crystal structure,

phonons, energy bands, semiconductors, Fermi surfaces, magnetic resonances, phase transitions, dielectrics, magnetic materials, and superconductors. Prerequisites: APHY 322, 439, PHYS 420. QR, SC

**PHYS 449b / APHY 449b, Solid-State Physics II** Michel Devoret  
The second term of the sequence described under APHY 448. QR, SC

**PHYS 458a / APHY 458a, Principles of Optics with Applications** Hui Cao  
Introduction to the principles of optics and electromagnetic wave phenomena with applications to microscopy, optical fibers, laser spectroscopy, and nanostructure physics. Topics include propagation of light, reflection and refraction, guiding light, polarization, interference, diffraction, scattering, Fourier optics, and optical coherence. Prerequisite: PHYS 430. QR, SC

**PHYS 460a, Mathematical Methods of Physics** Nicholas Read  
Survey of mathematical techniques useful in physics. Physical examples illustrate vector and tensor analysis, group theory, complex analysis (residue calculus, method of steepest descent), differential equations and Green's functions, and selected advanced topics. Prerequisite: PHYS 301 or other advanced mathematics course. QR

\* **PHYS 471a and PHYS 472b, Independent Projects in Physics** John Harris  
Each student works on an independent project under the supervision of a member of the faculty or research staff. Students participate in a series of seminar meetings in which they present a talk on their project or research related to it. A written report is also submitted. For students with a strong background in Physics course work. RP

## Physics and Geosciences

Directors of undergraduate studies: John Harris (Physics), 311 WL-W, 432-3601, [dus.physics@yale.edu](mailto:dus.physics@yale.edu); David Evans (Geology and Geophysics), 210 KGL, 432-3127, [david.evans@yale.edu](mailto:david.evans@yale.edu)

The major in Physics and Geosciences applies fundamental physical principles to the study of Earth and other planetary bodies at a level that is more intensive than in the Physics or Geology and Geophysics majors individually. Topics of interest range from atmosphere, ocean, and climate dynamics to physics of the solid Earth or of other planetary bodies.

**Prerequisites** The prerequisites for the major include MATH 120 or its equivalent, PHYS 170, 171 or another introductory physics sequence, the associated physics laboratory sequence PHYS 205L, 206L, and a course in ordinary differential equations chosen from ENAS 194, MATH 246, or PHYS 301.

**Requirements of the major** Beyond the prerequisites, the major requires a minimum of twelve term courses, including the senior project. At least four of these courses must be in Physics and at least six must be in Geology and Geophysics. Students complete a two- or three-term advanced physics sequence: either PHYS 401 and 402, or PHYS 410, 420, and 430. They must also take basic quantum mechanics (PHYS 439) and one elective numbered PHYS 320 or above. Required courses in Geology & Geophysics include one introductory course numbered G&G 100–150, with any accompanying laboratory; one elective numbered G&G 200 or above; and four advanced electives from one of two Geology and Geophysics tracks: the atmosphere, ocean, and climate track

or the solid Earth science track. A list of suggested electives is available from the office of the director of undergraduate studies in Geology and Geophysics or on the G&G departmental Web site (<http://earth.yale.edu>). No elective course may count toward multiple requirements for the major.

**Senior requirement** Students complete a two-term senior project on a topic that is appropriate for the combined major and acceptable to both the Physics and Geology and Geophysics departments. The project is undertaken in either PHYS 471, 472 or G&G 490, 491. In addition, students must present an oral report on their project to each department.

**Credit/D/Fail** No course taken Credit/D/Fail may be counted toward the Physics and Geosciences major, including prerequisites.

**Advising** Interested students should consult the directors of undergraduate studies in Physics and in Geology and Geophysics.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** MATH 120 or equivalent; PHYS 170, 171 or above; PHYS 205L, 206L; ENAS 194, MATH 246, or PHYS 301

**Number of courses** At least 12 courses beyond prereqs, incl senior req

**Specific courses required** PHYS 401 and 402, or 410, 420, and 430; PHYS 439

**Distribution of courses** 1 elective numbered PHYS 320 or above; 1 intro course in G&G, with lab, as specified; 1 elective numbered G&G 200 or above; 4 advanced courses in a G&G track, as specified

**Senior requirement** Senior project in PHYS 471, 472 or G&G 490, 491, on topic acceptable to both depts; oral report on project to both depts

## Physics and Philosophy

Directors of undergraduate studies: John Harris (Physics), 311 WL-W, 432-3601, [dus.physics@yale.edu](mailto:dus.physics@yale.edu); Daniel Greco (Philosophy), 106A C, 432-1659, [daniel.greco@yale.edu](mailto:daniel.greco@yale.edu)

Prospective majors in Physics and Philosophy are advised to begin taking the prerequisites during their freshman year, and to take at least two of the required Philosophy courses by the end of their sophomore year. Prerequisites for this major are as follows: mathematics through calculus at the level of MATH 120; any introductory Physics lecture sequence numbered 170 or higher; PHYS 165L and 166L, or 205L and 206L; one introductory Philosophy course.

Beyond the prerequisites, students take fourteen term courses, including the senior requirement. Seven courses in Physics approved by the director of undergraduate studies and numbered 301 or higher are required, including PHYS 301 or equivalent and either PHYS 439 or 440. Six courses in Philosophy or in History of Science, Medicine, and Public Health are required, including PHIL 125 and 126, one course in logic above the introductory level, and a Philosophy seminar selected with the approval of the directors of undergraduate studies.

**Senior requirement** Seniors must complete one of the following: (1) PHYS 471 or 472 (independent project); (2) PHIL 490 or 491 (senior essay); (3) PHIL 480 (tutorial) in



an appropriate subject; (4) an appropriate Philosophy seminar with the approval of the director of undergraduate studies in Philosophy.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** MATH 120; PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261; PHYS 165L, 166L, or 205L, 206L; 1 intro Phil course

**Number of courses** 14 term courses beyond prereqs, incl senior req

**Distribution of courses** 7 Physics courses numbered 301 or higher approved by DUS; 6 courses in Phil or HSHM, incl 1 in logic above intro level and a Phil sem, as specified

**Specific courses required** PHYS 301 or equivalent; PHYS 439 or 440; PHIL 125, 126

**Senior requirement** 1 from PHYS 471 or 472, PHIL 490 or 491, PHIL 480 on appropriate topic, or approved Phil sem

## Political Science

Director of undergraduate studies: David Simon, 115 Prospect St., 432-5236, david.simon@yale.edu; politicalscience.yale.edu/academics/about-undergraduate-program

#### FACULTY OF THE DEPARTMENT OF POLITICAL SCIENCE

**Professors** Bruce Ackerman, Akhil Amar, Seyla Benhabib, David Cameron, Bryan Garsten, Alan Gerber, Jacob Hacker, Oona Hathaway, Jolyon Howorth (*Visiting*), Gregory Huber, Stathis Kalyvas, Joseph LaPalombara (*Emeritus*), Ellen Lust, David Mayhew, Douglas Rae, John Roemer, Susan Rose-Ackerman, Frances Rosenbluth, Bruce Russett (*Emeritus*), Nicholas Sambanis, James Scott, Ian Shapiro, Stephen Skowronek, Steven Smith, Susan Stokes, Alec Stone Sweet, Peter Swenson, John Wargo, Steven Wilkinson (*Chair*), Elisabeth Wood

**Associate Professors** John Bullock, Ana De La O, Susan Hyde, Jason Lyall, Karuna Mantena, Andrew March

**Assistant Professors** Peter Aronow, Kate Baldwin, Deborah Beim, Allan Dafoe, Alexandre Debs, Samuel DeCanio, John Henderson, Eitan Hersh, Sigrun Kahl, H el ene Landemore, Adria Lawrence, Nuno Monteiro, Margaret Peters, Kelly Rader, Thania Sanchez, Tariq Thachil, Vesla Weaver, Jessica Weiss

**Lecturers** Graeme Auld, Steven Calabresi, Seok-ju Cho, Madhavi Devasher, Alexandra Dufresne, Yiftah Elazar, Dean Esserman, Michael Fotos, Cynthia Horan, Boris Kapustin, Matthew Kocher, Stephen Latham, Christopher Lebron, Vikram Mansharamani, Andrew Sabl, Walter Shapiro, Rachel Silbermann, David Simon, Derek Slap, James Sleeper, John Starr, John Stoehr, Milan Svulik, Bonnie Weir, Graeme Wood

**Advising** Students majoring in Political Science are expected to have a member of the Political Science faculty as an adviser. Upon declaring their major, students are asked to identify an adviser in their substantive field of interest. The fields of interest of the faculty are listed on the departmental Web site (<http://politicalscience.yale.edu/people/faculty>). For newly declared majors having difficulty identifying an appropriate adviser, one or more members of the faculty will be suggested by the department. Students are also encouraged to seek advice from the department's residential college faculty representatives as well as from other members of the department who are

knowledgeable about their fields of interest. Majors must secure written approval of their course selections each term from the director of undergraduate studies. All subsequent changes in a student's major program must also be approved.

Students are urged to take the initiative in shaping a coherent program suited to their interests, and they should also consult frequently with their adviser. The director of undergraduate studies and other members of the department can provide advice about departmental requirements, options within the major, requirements of two majors, study abroad, and other matters related to the major. Additional information on advising can be found on the departmental Web site (<http://politicalscience.yale.edu/academics/undergraduate-program/advising>).

**The standard program for the Class of 2015** Eleven term courses in political science are required. Students must take at least two courses in each of any three of the department's five fields – international relations, American government, political philosophy, analytical political theory, and comparative government. Students expecting to major in Political Science should take one or more introductory-level courses in the department early in their college careers. Introductory courses count toward the overall course requirement and toward the departmental fields requirement.

Students are encouraged to take courses related to political science that are offered by other departments. Students in the Class of 2015 who elect the standard program may petition to count up to three such courses toward the major. Students may routinely count college seminars taught by members of the Political Science faculty toward the major, and they may petition to count one college seminar taught by an instructor outside the department. Students who have completed Directed Studies may, with the approval of the director of undergraduate studies, count one term of DRST 005, 006 toward the major.

**The standard program for the Class of 2016 and subsequent classes** Twelve term courses in political science are required. Students must take at least two courses in each of any three of the department's five fields – international relations, American government, political philosophy, analytical political theory, and comparative government. Students expecting to major in Political Science should take one or more introductory-level courses in the department early in their college careers. Introductory courses count toward the overall course requirement and toward the departmental fields requirement.

Students are encouraged to take courses related to political science that are offered by other departments. Students who elect the standard program may petition to count up to two such courses toward the major. Students may routinely count college seminars taught by members of the Political Science faculty toward the major, and they may petition to count one college seminar taught by an instructor outside the department. Students who have completed Directed Studies may, with the approval of the director of undergraduate studies, count one term of DRST 005, 006 toward the major.

**Senior requirement** Students in all classes majoring in Political Science are required to take at least two seminars taught by members of the Political Science department, including at least one during the senior year. Seniors in the major must also complete a senior essay, as described under "Senior essay" below. The essay can be written either in

one term or over both terms of the senior year. In order to graduate from Yale College, a student majoring in Political Science must achieve a passing grade on the senior essay.

**Credit/D/Fail** For students in the Class of 2016 and subsequent classes, up to two lecture courses taken Credit/D/Fail may count toward the major, with permission of the director of undergraduate studies.

**Seminar preregistration** Each term, the department provides all declared majors the opportunity to apply for preregistration to its seminars. Instructors of seminars may preregister up to twelve students per course, or up to eight students for courses multiple-titled with other programs. The maximum enrollment for each seminar is eighteen. Students may be preregistered for up to two seminars per term. For fall-term seminar preregistration, an initial notice is sent to all majors in July; for spring-term preregistration, the notice is sent in November. Only students who are declared Political Science majors at the time the notice is sent are eligible to participate.

**Senior essay** The senior essay provides an appropriate intellectual culmination to the student's work in the major and in Yale College. The essay should ordinarily be written on a topic in an area in which the student has previously done course work. It should rest on extensive research that is appropriate to the subject matter. Essays are expected to be in the range of twenty-five to thirty double-spaced pages. At the beginning of the term in which the essay is written, students must have their senior essay topic approved by a faculty member who has agreed to advise them. Each student is expected to consult regularly with the seminar instructor or adviser and take the initiative in developing a plan of research, scheduling regular meetings, and submitting preliminary drafts for review.

One-term essays may be written either in a seminar or, with the approval of an adviser and the director of undergraduate studies, in PLSC 480, *One-Term Senior Essay*. Senior essays written in the fall term are due on December 5, 2014. Spring-term and yearlong essays are due on April 20, 2015. More extensive information about the senior essay can be found on the departmental Web site (<http://politicalscience.yale.edu/academics/undergraduate-program/undergraduate-senior-essay>).

**The yearlong senior essay** Students who wish to undertake a more extensive research project than is possible in a single term may fulfill the senior essay requirement by enrolling in the yearlong course sequence PLSC 490, *The Senior Colloquium*, and 491, *The Senior Essay*. PLSC 490 also counts toward the senior seminar requirement. In the fall term, students writing a yearlong senior essay develop a research prospectus for the essay and begin their research under the supervision of a member of the faculty who specializes in the area being investigated. In the spring term, students complete the essay. Yearlong senior essays are expected to be substantially longer than a regular term paper. While there is no fixed length, they are normally fifty to sixty pages long.

Majors who wish to enroll in the yearlong senior essay must apply for admission in the spring of their junior year. The deadline for the Class of 2016 is March 30, 2015. By that date, students should submit to the office of the director of undergraduate studies: (1) the yearlong senior essay prospectus form signed by a faculty adviser who has agreed to supervise the student during both terms of the senior year; and (2) a one-to-two-

page statement describing the research project. It is expected that no more than fifteen students will be admitted each year.

**The major with an interdisciplinary concentration** Students majoring in Political Science may choose an interdisciplinary concentration, which allows them to identify and pursue an area of study that crosses conventional disciplinary and departmental boundaries. Examples of interdisciplinary concentrations are urban studies, health politics and policy, political economy, political psychology, and global affairs. Students choosing such a concentration are required to take twelve term courses toward the major. At least seven courses must be in the field of concentration. Of the courses counting toward the major outside of the field of concentration, at least two courses must be taken in each of any two of the department's five fields. The senior requirement is the same as for the standard program, with the proviso that the essay must be written on a subject that falls within the field of concentration.

For the Class of 2015, as many as three courses taken in other departments may, with the approval of the director of undergraduate studies, be applied toward the concentration. Two additional courses from other departments may be counted toward the departmental fields requirement, with the permission of the director of undergraduate studies. For the Class of 2016 and subsequent classes, a maximum of three courses taken in other departments may be counted toward the major, with the permission of the director of undergraduate studies.

Students wishing to pursue the Political Science major with an interdisciplinary concentration must submit an application and meet with the director of undergraduate studies to discuss their proposed program of study. The application is due prior to the beginning of the November recess in the student's final year of enrollment.

**The intensive major** The intensive major gives students an opportunity to undertake more extensive course work and research for the senior essay than is possible in the standard major. Requirements for the intensive major are identical to those for the nonintensive major (standard program or interdisciplinary concentration), with the following exceptions: (1) in the spring term of the junior year, intensive majors take PLSC 474, Directed Reading and Research for Junior Intensive Majors, in preparation for writing a yearlong senior essay; (2) in the senior year, intensive majors fulfill the senior essay requirement by enrolling in the yearlong course sequence PLSC 490, The Senior Colloquium, and PLSC 493, Senior Essay for Intensive Majors (PLSC 490 also counts toward the senior seminar requirement); (3) for the Class of 2016 and subsequent classes, a total of fifteen term courses is required.

Juniors wishing to pursue an intensive major must apply to the director of undergraduate studies by November 14, 2014. The application should contain: (1) the intensive major application form signed by a faculty adviser who has agreed to supervise the student for the final three terms of enrollment; (2) a plan of study that identifies the political science courses that will be taken in those three terms; and (3) a one-to-two-page description of the proposed senior essay.

**Study abroad** Students who study in a Junior Term Abroad program or at another university during the summer may, with the approval of the director of undergraduate studies, count up to two courses toward the major. Students who study in a Junior Year

Abroad program may, with the approval of the director of undergraduate studies, count up to four courses toward the major.

**Combined B.A./M.A. degree program** Exceptionally able and well-prepared students may complete a course of study leading to the simultaneous award of the B.A. and M.A. degrees after eight terms of enrollment. See "Simultaneous Award of the Bachelor's and Master's Degrees" under Special Arrangements (p. 63) in the Academic Regulations (p. 32). Interested students should consult the director of undergraduate studies prior to the sixth term of enrollment for specific requirements in Political Science.

## REQUIREMENTS OF THE MAJOR

### B.A. DEGREE, STANDARD PROGRAM

**Prerequisites** None

**Number of courses** *Class of 2015*—11 term courses; *Class of 2016 and subsequent classes*—12 term courses

**Distribution of courses** 2 courses in each of 3 of the 5 departmental fields

**Substitution permitted** *Class of 2015*—3 courses from other depts with DUS approval; *Class of 2016 and subsequent classes*—2 courses from other depts with DUS approval

**Senior requirement** 2 seminars, 1 in senior year, and 1-term senior essay in seminar or in PLSC 480; or 1 seminar as specified and 2-term senior essay in PLSC 490, 491

**Intensive major** *Class of 2015*—11 term courses; *Class of 2016 and subsequent classes*—15 term courses; *All classes*—PLSC 474; 2 courses in each of 3 of the 5 departmental fields; 1 seminar as specified and 2-term senior essay in PLSC 490, 493

### B.A. DEGREE, INTERDISCIPLINARY CONCENTRATION

**Prerequisites** None

**Number of courses** 12 term courses

**Distribution of courses** *Class of 2015*—7 courses in field of concentration, incl up to 3 from other depts with DUS approval; 2 courses in each of 2 of the 5 departmental fields, incl up to 2 from other depts with DUS approval; *Class of 2016 and subsequent classes*—7 courses in field of concentration; 2 courses in each of 2 of the 5 departmental fields; maximum of 3 courses from other depts with DUS approval

**Senior requirement** 2 seminars, 1 in senior year, and 1-term senior essay in seminar or in PLSC 480; or 1 seminar as specified and 2-term senior essay in PLSC 490, 491

**Intensive major** *Class of 2015*—12 term courses; *Class of 2016 and subsequent classes*—15 term courses; *All classes*—PLSC 474; 7 courses in field of concentration; 2 courses in each of 2 of the 5 departmental fields; 1 seminar as specified and 2-term senior essay in PLSC 490, 493

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## Introductory Courses

**PLSC 111b, Introduction to International Relations** Nuno Monteiro

Key questions and issues in international relations, including both the evolution of the international system over the last century and topics in contemporary world politics. Causes and conduct of war, sources of order, the emergence of new actors, the spread of norms, and evolution of the global economy. SO

**PLSC 113b, Introduction to American Politics** Samuel DeCanio

Introduction to American national government. The Constitution, American political culture, civil rights, Congress, the executive, political parties, public opinion, interest groups, the media, social movements, and the policy-making process. SO

**PLSC 114b, Introduction to Political Philosophy** Bryan Garsten

Fundamental issues in contemporary politics investigated through reflection on classic texts in the history of political thought. Emphasis on topics linked to modern constitutional democracies, including executive power, representation, and political parties. Readings from Plato, Machiavelli, Hobbes, Locke, Rousseau, Madison and Hamilton, Lincoln, and Tocqueville, in addition to recent articles on contemporary issues. SO

EP&E: Intro Political Phil

**PLSC 116a, Comparative Politics: States, Regimes, and Conflict** Adria Lawrence

Introduction to the study of politics and political life in the world outside the United States. State formation and nationalism, the causes and consequences of democracy, the functioning of authoritarian regimes, social movements and collective action, and violence. SO

**PLSC 118a, The Moral Foundations of Politics** Ian Shapiro

An introduction to contemporary discussions about the foundations of political argument. Emphasis on the relations between political theory and policy debate (e.g., social welfare provision and affirmative action). Readings from Bentham, Mill, Marx, Burke, Rawls, Nozick, and others. SO

EP&E: Intro Political Phil

## International Relations

**\* PLSC 122b / EP&E 285b, Humanitarian Intervention** Jolyon Howorth

Analysis of Western intervention in humanitarian crises since the end of the Cold War. Case studies from Kurdistan, Somalia, Bosnia-Herzegovina, Kosovo, Ivory Coast, Libya, and Mali. Reasons for nonintervention in Rwanda, Darfur, and Syria. Ethics of the humanitarian dimension; politics of coalitions of the willing; the material dimension of interest; the effectiveness of humanitarian intervention in achieving its stated objectives. SO

**\* PLSC 123b, Political Economy of Foreign Aid** Peter Aronow

Introduction to modern quantitative research methods in international political economy, with a focus on empirical evidence related to foreign aid. The state of knowledge regarding the effects of development assistance on democratization, governance, human rights, and conflict. The challenges of drawing causal inferences in the domain of international political economy. SO

**PLSC 124a / ER&M 317a, The Politics of Migration** Margaret Peters

The politics of migration in both receiving and sending states during the past two hundred years. Focus on current debates over immigration in the United States. Topics include public opinion, interest group politics, the role of institutions, policy formation, and human rights. SO

**PLSC 128b / GLBL 247b, Development under Fire** Jason Lyall

The recent emergence of foreign assistance as a tool of counterinsurgency and post-conflict reconciliation. Evaluation of the effects of aid in settings such as Afghanistan,

Iraq, Colombia, and the Philippines. Examination of both theory and practice of conducting development work in the shadow of violence. Strengths and weaknesses of different evaluation methods, including randomized control trials (RCTs) and survey experiments. so

**PLSC 130a / GLBL 260a, Nuclear Politics** Alexandre Debs

The pursuit, use, and non-use of nuclear weapons from the Manhattan Project to the present. The effect of the international system, regional dynamics, alliance politics, and domestic politics in the decision to pursue or forgo nuclear weapons. The role of nuclear weapons in international relations, the history of the Cold War, and recent challenges in stemming nuclear proliferation. so

\* **PLSC 132a / GLBL 379a, China's International Relations** Jessica Weiss

Analysis of contemporary Chinese diplomacy, including China's increasing regional and global influence. Mainstream concepts and theories in international relations applied to current events and policy debates. Priority to majors in Political Science and in Global Affairs. so

\* **PLSC 140a / GLBL 381a, Military Power** Nuno Monteiro

The foundations, applications, evolution, and limits of military power. Reading of Clausewitz's *On War* in conjunction with contemporary works. Issues include civil-military relations, military power and political influence, coercion, small wars, occupation and insurgency, and the revolution in military affairs. so

**PLSC 143a, International Challenges of the Twenty-First Century** Jolyon Howorth

Challenges facing the global community as it undergoes a power transition with the relative decline of the West and the emergence of powers such as China, India, and Brazil. Natural challenges such as demography, climate, and energy security; systemic issues related to the balance of power, economic crises, and trade globalization; new threats, including rogue states, terrorism, and WMD proliferation; regional challenges in Asia, Ukraine/Crimea, the Middle East, and Africa. so

**PLSC 148b, Theories, Practices, and Politics of Human Rights**

David Simon and Alice Miller

Introduction to core human-rights issues, ideas, practices, and controversies. The concept of human rights as a philosophical construct, a legal instrument, a political tool, an approach to economic and equity issues, a social agenda, and an international locus of contestation and legitimation. Required for students in the Human Rights Undergraduate Scholars program. so

\* **PLSC 152a / EP&E 245a, Global Firms and National Governments**

Joseph LaPalombara

The type and magnitude of foreign direct investments made by a relatively small number of large firms, and the political influence such firms exercise. Complex challenges raised by powerful global firms emerging from once-dependent and less-developed countries such as China, India, and Brazil. Discussion of the present and probable future relationships between economic and governmental organizations that result from the processes of globalization. Case studies illustrate specific problems faced by both corporate leaders and national and subnational public-policy officials. so

**\* PLSC 160b / GLBL 377b, The United States, Russia, and Eurasian Security**

Thomas Graham

Geopolitical competition between the United States and Russia since World War II, with a focus on the Eurasian region. Turmoil in the region resulting from the rise of new powers, nuclear proliferation, international terrorism, and the struggles of old institutions to cope with new challenges. Possibilities for shifting American-Russian relations from geopolitical competition to strategic cooperation. SO RP

**\* PLSC 162b, Japan and the World** Frances Rosenbluth

The historical development of Japan's international relations since the late Tokugawa period; World War II and its legacy; domestic institutions and foreign policy; implications for the United States; and interactions between nationalism and regionalism. SO

**PLSC 165b, International Security** Matthew Kocher

An introduction to international security. General theories of state interests and behavior; the causes, conduct, and regulation of violence among nations. SO

**PLSC 166b, The New Europe** David Cameron

European politics since World War II, with emphasis on postwar geopolitical settlement, the development of the European Community and Union, the demise of the Soviet Union and other communist regimes, and current challenges facing Europe. SO

**\* PLSC 169a, Classics of World Politics** Bruce Russett

Examination of classic political theory from Thucydides to the present. Attention to historical context and contemporary relevance. Priority to sophomores. SO

**PLSC 172a, Strategy, Technology, and War** Paul Bracken

International relations, management, and economics used to analyze multipolarity and instability in a second nuclear age. Emphasis on the impact of technological innovation, i.e., nuclear proliferation, advanced conventional weapons, drones, cyberwar, intelligence analytics and surveillance, and financial warfare. The evolving relationship of Silicon Valley to the Pentagon and NSA, including its impact on grand strategy, technology, and conflict. Relevant high-tech developments in other countries, e.g., China, India, and Israel. SO

**PLSC 176a / HIST 261a, The Cold War** John Gaddis

The Cold War from beginning to end, viewed from the perspective of all its major participants, with emphasis on recently released Soviet, East European, and Chinese sources. Counts toward either European or U.S. distributional credit within the History major, upon application to the director of undergraduate studies. HU, SO

**PLSC 179b / EAST 219b, China in World Politics** Jessica Weiss

China's rise to prominence and its foreign relations from 1949 to the present, focusing on the post-Mao period. SO

**\* PLSC 183b / EP&E 259b, Europe, the United States, and the Iraq Crisis**

Jolyon Howorth

Examination of the contrasting relations between the main European powers and the United States in their approaches to Iraq in order to understand the divisions attending the 2003 war and the subsequent transfer of sovereignty. Topics include the Iran-Iraq War (1980–88), the first Persian Gulf crisis (1990–91), the sanctions regime (1991–2002), problems of peacekeeping and nation building, and the Obama exit strategy. SO



**\* PLSC 184a / GBL 378a, The United Nations and the Maintenance of International Security** Jean Krasno

The evolution of the United Nations and its role in a post–Cold War international system both in preventive diplomacy, with its use of force for peacekeeping and peace enforcement, and in peace building. SO

## American Government

**\* PLSC 202a / EP&E 466a, Children’s Law and Policy** Alexandra Dufresne

Major themes and controversies in children’s law and policy in the United States. Topics include juvenile justice, child abuse and neglect, special education, and the rights of immigrant and refugee children. Development of skills in legal reasoning, analysis, and policy design. Priority to junior and senior majors in Ethics, Politics, and Economics and in Political Science. SO

**\* PLSC 204a, Courts, Judges, and Controversies** Deborah Beim

Controversies surrounding courts, judges, and the decisions they make, with a focus on the American judiciary. Topics include affirmative action, race and the death penalty, ethnic bias in judicial decision making, gender and judging, and courts and social change. SO

**PLSC 205a, The American Presidency** Stephen Skowronek

The historical development and current operations of the American presidency. Topics include constitutional powers, the organization of popular support, the modern executive establishment, and the politics of presidential leadership. SO

**\* PLSC 210a, Political Preferences and American Political Behavior** John Henderson

Introduction to research methods and topics in American political behavior. Focus on decision making from the perspective of ordinary citizens. Topics include utility theory, heuristics and biases, political participation, retrospective voting, the consequences of political ignorance, the effects of campaigns, and the ability of voters to hold politicians accountable for their actions. SO

**PLSC 211a / AFAM 325a, Social Policy and the Politics of Inequality in the United States** Vesla Weaver

The contours and consequences of inequality in the United States, including explanations for why it has expanded over the past several decades and why Americans seem to tolerate more of it. The development of the modern welfare state; causes of racialized poverty, segregation, and incarceration. SO

**\* PLSC 212a, Democracy and Sustainability** Michael Fotos

Democracy, liberty, and the sustainable use of natural resources. Concepts include institutional analysis, democratic consent, property rights, market failure, and common pool resources. Topics of policy substance are related to human use of the environment and to U.S. and global political institutions. SO

**PLSC 214b, The Politics of American Public Policy** Jacob Hacker

Public policy in the United States and the methodological and theoretical tools used to study the forces that shape it. Economic and political science perspectives on the policy process and contemporary American governance. Domestic policy issues such as health care, economic inequality, job insecurity, the federal debt, environmental protection, criminal justice, financial regulation, and primary and higher education. WR, SO

**PLSC 215b / EVST 255b / F&ES 255b, Environmental Politics and Law** John Wargo  
Exploration of the politics, policy, and law associated with attempts to manage environmental quality and natural resources. Themes of democracy, liberty, power, property, equality, causation, and risk. Case histories include air quality, water quality and quantity, pesticides and toxic substances, land use, agriculture and food, parks and protected areas, and energy. SO

\* **PLSC 217a, U.S. National Elections** Eitan Hersh

An investigation of electoral realignments, voting for president and Congress, voter turnout, incumbency advantage, nominations, and campaign finance. SO

\* **PLSC 221b / EP&E 323b, U.S. Immigration Law and Policy** Alexandra Dufresne  
Major themes and controversies in American immigration law and policy, including admission and deportation of noncitizens, protection of asylum-seekers and refugees, illegal immigration, strategies of immigration law enforcement, constitutional limits on executive power, the role of administrative agencies and federal courts, and civil rights of noncitizens before and after 9/11. Emphasis on legal reasoning and analysis. Recommended preparation: PLSC 113 and 233. SO

\* **PLSC 222b / AFAM 276b, Race and the Politics of Punishment** Vesla Weaver  
Historical and contemporary issues surrounding race and punishment in the American criminal justice system, with a focus on research involving institutional development, policy history, and racial orders. The influence of racial perceptions on policy preferences; ways in which the criminal justice system defines and creates race; debates about black inclusion and equality and their relation to debates about crime and punishment. SO

\* **PLSC 224b, Political Leadership** Stephen Skowronek

Examination of political leadership as both a concept and a practice. Survey of classic works by Machiavelli, Carlyle, Weber, Lenin, and Schumpeter. Consideration of the difference between transformational leadership and transactional leadership, and between executive leadership and reform leadership. Issues include the conundrum of "democratic leadership" and the role of narrative in leadership. WR, SO

\* **PLSC 225a, Policing in America** Dean Esserman

Examination of major innovations in policing over the past three decades. The effects of these changes on crime control and public safety; the extent to which new approaches have been implemented in police departments; dilemmas these approaches have created for police management. Analysis of critical issues that persist in the profession, including race, the use of force, and police deviance. SO

**PLSC 229a, Election Rules and Campaign Strategy** Eitan Hersh

Examination of political campaigns in the United States. Factors that people use to make voting decisions; the influence of election rules on candidate strategy and on voters' decision-making processes; reasons candidates choose to pursue specific strategies, and the effectiveness of those strategies at winning votes; critical analysis of opinions voiced by campaign operatives and media personalities. SO

\* **PLSC 232b, Information, Technology, and Political Power** Eitan Hersh

The role of information in the political process. Effects on politics of information generated through new and old technologies; the decision-making processes of voters, mass mobilizers, and government reformers, as well as elite political actors such as

campaign operatives, bureaucrats, and members of Congress; political and moral issues related to information flows, including privacy, innovation, and collective action. SO

**PLSC 233b, Constitutional Law** Akhil Reed Amar

An introduction to the main themes of the American Constitution – popular sovereignty, separation of powers, federalism, and rights – and to basic techniques of constitutional interpretation. Special emphasis on the interplay of constitutional text, judicial doctrine, and constitutional decision making outside the judiciary. SO

\* **PLSC 235a, Political Journalism and Public Policy** Derek Slap

The effects of political journalism on American public policy from 1960 to the present. Focus on changes in the media during the past few decades. The Dewey-Lippmann debate on the role journalism should play in politics, marketing in the 1968 presidential campaign, broadcast news and audience fragmentation in the 1970s, media dysfunction and the Clinton and Obama health care initiatives, the Internet, hyperpartisanship, media bias, and recent gun control initiatives. SO

\* **PLSC 236b, Presidential Campaigns and the Media** Walter Shapiro

The intersection of two institutions in the midst of major transformations – the political campaign industry and the news business. Presidential campaign coverage during the last third of the twentieth century; the beleaguered economic structure of the news business in the twenty-first century; media coverage of the 2008 and 2012 presidential races, with emphasis on how campaigns adapted to the changed news landscape and to new ways of communicating with voters. SO

\* **PLSC 237a, Persuasion and Political Communication** John Henderson

The history of political communication, persuasion, and demagoguery in the American political tradition, from the design and ratification of the Constitution to modern debates over terrorism and authoritarianism. The limits of democratic deliberation and representation; elite communication strategies that influence policy making and elections. SO

\* **PLSC 240b / EP&E 443b, Public Schools and Public Policy** John Starr

Exploration of policy options on controversial education issues. Case studies from both districts and states. Preference to students with training and experience in national, state, and local public policy. SO RP

\* **PLSC 245a / AFAM 268a, Urban Politics and Policy** Cynthia Horan

Approaches to urban politics and political economy. Application of theories to contemporary policy issues such as policing, metropolitan disparities, and inner-city revitalization. SO

**PLSC 248a, Political Economy of Health Care** Peter Swenson

Political and economic factors that have influenced efforts to achieve quality, economy, and equality in the delivery of American health care since the early twentieth century; some attention to international comparisons. Medical licensing; drug regulation; malpractice law; provider payment and care management; guaranteed health insurance; emergence of the private, employer-based insurance system; recent legislative actions and controversies concerning the quality and cost-effectiveness of health care.

Recommended preparation: introductory microeconomics. SO

**PLSC 249b, Introduction to Public Opinion** Samuel DeCanio

Public opinion in democratic societies. Voter ignorance, representation, elite manipulation of public opinion, and attitude formation. SO

**PLSC 252a, Crime and Punishment** Greg Huber

The theory and practice of crime and punishment in contemporary America from the standpoint of politics and political theory and in light of debates about empirical evidence, the politicization of crime, civil rights issues, abortion, psychiatry and the law, and arguments about punishment and prison reform. SO

**\* PLSC 253a / ENGL 467a, Journalism** Steven Brill

An intensive workshop in the journalism profession and its changing role and accelerating challenges. Definitions of journalism; the role of journalism in a democracy and a free market; differences between information, news, vicarious news, and entertainment; knowing and telling a good story; the structure of newspaper articles, blogs, online newspapers and magazines, mixed digital media, magazine features, television reports, and nonfiction books; interviewing techniques; fairness; sourcing; the economics of journalism; and audience. Fulfills the core seminar requirement for Yale Journalism Scholars. No prerequisites. WR

**PLSC 254b, Political Parties in the American System** John Henderson

The evolution of American political parties and the role of parties and partisanship in contemporary government and elections. Empirical and theoretical accounts of parties, including divided government, parties in Congress, realignment, responsible party government, party identification, and ideology. Elite-led polarization, decline and resurgence of strong parties, and the antiparty constitutional tradition. SO

**\* PLSC 256b / EP&E 248b, American Political Institutions** Michael Fotos

The origins and development of American political institutions, especially in relation to how institutions shape the policy process. Issues of temporality, policy feedback, and policy substance. SO

**PLSC 257b, Bioethics and Law** Stephen Latham

The treatment by American law of major issues in contemporary biomedical ethics: informed consent, assisted reproduction, abortion, end-of-life care, research on human subjects, stem cell research, and public health law. Readings include legal cases, statutes, and regulations. No background in law assumed. SO

**\* PLSC 259b, Making Urban Policy** Cynthia Horan

Investigation of how policy ideas, analysis, and implementation both contribute to and constrain the mitigation of America's urban problems. Particular attention to how policy analysts define issues, design public programs, and assess policy effects in situations of economic change, fiscal constraint, political fragmentation, racial conflicts, and shifting power relationships. SO

**\* PLSC 260a, Public Schools and Politics** John Starr

Investigation of how political decisions that affect public schools are made at local, state, and federal levels. Case studies from both districts and states. Preference to students with training and experience in national, state, and local politics. SO RP

\* **PLSC 261b, American Political Development** Stephen Skowronek

Patterns of political change and institutional development in the United States. Topics include patterns of reform, the political construction of interests and movements, problems of political culture, party building, and state building. so

\* **PLSC 265a, Classics of Political Journalism** John Stoehr

The history of political writing by American journalists, with emphasis on lasting works of literature. Ways that journalists have represented the political process; narratives that have come and gone over time. Authors include H. L. Mencken, A. J. Liebling, Joan Didion, Hunter S. Thompson, Norman Mailer, Susan Sontag, and David Foster Wallace. so

\* **PLSC 272a, U.S. Party Formation** Samuel DeCanio

The ideological development of the Republican and Democratic parties. The rise of contemporary American ideological divisions; economic regulatory issues generating partisan conflict during the nineteenth and twentieth centuries. so

\* **PLSC 280b / AFAM 270b, Poverty, Politics, and Policy in the American City**

Cynthia Horan

Examination of how politics informs the formulation and implementation of policies to address urban poverty. Consideration of alternative explanations for poverty and alternative government strategies. Focus on efforts by local organizations and communities to improve their situations within the context of government actions. so

## Political Philosophy

**PLSC 281a / PHIL 334a / RLST 273a, Ethical and Social Issues in Bioethics**

Stephen Latham

A selective survey of issues in biomedical ethics. Comparison of different points of view about biomedical issues, including religious vs. secular and liberal vs. conservative. Special attention to issues in research and at the beginning and end of life. so

\* **PLSC 282a, The Idea of Power** Christopher Lebron

An intensive survey of the theoretical literature on power. Questions such as how to identify the sociopolitical manifestations of power that exert influence in society; when power is legitimate; and the relationship between power and injustice. Enrollment limited to sophomores. so

\* **PLSC 288a / EP&E 287a, Liberty in Politics, Markets, and Society** Andrew Sabl

Key questions regarding liberty explored through critical examination of classic texts by Locke, Montesquieu, Smith, Tocqueville, and Mill. The definition, origins, and foundations of liberty; whether liberty in some realms might require the restriction of freedom in others. so

**PLSC 290a / HUMS 302a / SOCY 151a, Foundations of Modern Social Theory**

Emily Erikson

Major works of social thought from the beginning of the modern era through the 1920s. Attention to social and intellectual contexts, conceptual frameworks and methods, and contributions to contemporary social analysis. Writers include Hobbes, Locke, Rousseau, Kant, Adam Smith, Marx, Freud, Peirce, Weber, and Durkheim. so

\* **PLSC 292a / EP&E 276a, Rethinking Sovereignty, Human Rights, and Globalization**

Seyla Benhabib

Discussion of the crises of sovereignty and the end of sovereignty. Postnationalist, cosmopolitan, and neoliberal criticisms of sovereignty. Traditional models of sovereignty compared with cosmopolitan alternatives; implications of these models for the definition and enforcement of rights. Readings include works by Hobbes, Kant, Rousseau, Austin, Schmitt, Kelsen, Habermas, Waldron, Pogge, Sassen, and Aleinikoff. SO

**PLSC 294b / HUMS 319b, Modern Political Philosophy** Karuna Mantena

Fundamental political questions about freedom, authority, modernity, and the nature of politics as they are treated in Western political thought from the sixteenth century to the twentieth. Competing interpretations by Machiavelli, Hobbes, Spinoza, Locke, Rousseau, Publius, Tocqueville, and others. SO

\* **PLSC 295a / HUMS 355a, The Idea of Statesmanship** Steven Smith

The idea of the statesman and the role of statecraft in founding and preserving political institutions. Statesmanship as a form of art guided by rational deliberation and decision making; the roles of historical circumstances, economic interests, and cultural values. Readings include theoretical works from Machiavelli to Isaiah Berlin and political works from the Federalist Papers to Winston Churchill. HU, SO

\* **PLSC 297a / EP&E 312a, Moral Choices in Politics** Boris Kapustin

A study of how and why people make costly moral choices in politics. Figures studied include Thomas More, Abraham Lincoln, Nelson Mandela, Václav Havel, and Aung San Suu Kyi. SO

\* **PLSC 303a / HIST 247Ja, The Invention of Modern Democracy** Yiftah Elazar

The reinvention of the classical idea of democracy as both a political institution and an ideal, from the seventeenth to the nineteenth century. Classical and neoclassical critiques of democratic government; revival and conceptual transformation in the Puritan, American, and French revolutions. Readings focus on Anglo-American political thought of the period, including its relation to classical, humanist, and contemporary continental sources. Counts toward either European or U.S. distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU

\* **PLSC 304b / EP&E 410b, Business Ethics** Vikram Mansharamani

Current ethical problems facing business leaders. Visible and invisible factors that make ethical decisions complex and difficult to analyze. Anticipating ethical dilemmas; framing decisions and gathering information; the difficulties of taking appropriate, timely action.

\* **PLSC 305b / EP&E 353b, Critique of Political Violence** Boris Kapustin

Methods of conceptualizing political violence that are prevalent in contemporary political philosophical discourse. Use of theoretical-analytical tools to examine the modes violence assumes and the functions it performs in modern political life as well as the meanings and possibilities of nonviolence in politics. SO

\* **PLSC 313a / EP&E 380a, Bioethics, Politics, and Economics** Stephen Latham  
Ethical, political, and economic aspects of a number of contemporary issues in biomedical ethics. Topics include abortion, assisted reproduction, end-of-life care, research on human subjects, and stem cell research. SO

\* **PLSC 315b / AFAM 269b / EP&E 458b / PHIL 461b, Egalitarianism**  
Christopher Lebron

The concept of equality in normative political theory explored through contemporary philosophical texts. Reasons why oppressed, marginalized, and systematically disadvantaged groups express their claims in terms of equality; racial inequality as a case study. SO

\* **PLSC 321b / HIST 250Jb, The Contested Idea of Liberty** Yiftah Elazar

The meaning and value of liberty in the seventeenth and eighteenth centuries, with a focus on the anglophone world. The relation of liberty to concepts such as virtue, reason, conscience, nature, law, property, arms, security, and independence; its contested role in debates on democratic participation, religious toleration, the corrective influence of commerce, the American Revolution, slavery, and the subjection of women; recent debates on liberty. Counts toward either European or U.S. distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU

\* **PLSC 322b, Empire and Modern Political Thought**

Karuna Mantena and David Bromwich

The role of European expansion in the development of modern political thought. How the imperial experience—discovery of new peoples, conquest, colonial settlement, and global commerce—affected the formation of such central concepts of political theory as reason, freedom, rights, sovereignty, property, and progress. Readings in Vitoria, Montaigne, Hobbes, Grotius, Locke, Diderot, Smith, Kant, Burke, Mill, Marx, and Arendt. SO

\* **PLSC 324a / EP&E 435a, Luck and Justice** Christopher Lebron

The relations among luck, responsibility, and social justice. Questions surrounding kinds of luck, justification, rational agency, and blame. The problem of assigning responsibility for outcomes over which an individual has no direct control. SO

\* **PLSC 332b / EP&E 299b, Philosophy of Science for the Study of Politics**

Ian Shapiro

An examination of the philosophy of science from the perspective of the study of politics. Particular attention to the ways in which assumptions about science influence models of political behavior, the methods adopted to study that behavior, and the relations between science and democracy. Readings include works by both classic and contemporary authors. SO

\* **PLSC 336b / EP&E 469b, Toleration in Theory and Practice** Andrew Sabl

Toleration as a political practice that allows people with fundamentally different beliefs to live together; necessary limits, real or alleged, of that practice. Perspectives from the fields of history and political science and from moral, political, and legal theory. Origins and varieties of toleration; case studies in the United States and abroad, including hate speech, Amish exemptions from general laws, Islam and secularism, and national security as a basis for limits on religious freedom. SO

## Analytical Political Theory

**PLSC 344a / EP&E 295a, Game Theory and Political Science** Deborah Beim  
Introduction to game theory—a method by which strategic interactions among individuals and groups in society are mathematically modeled—and its applications to political science. Concepts employed by game theorists, such as Nash equilibrium, subgame perfect equilibrium, and perfect Bayesian equilibrium. Problems of cooperation, time-consistency, signaling, and reputation formation. Political applications include candidate competition, policy making, political bargaining, and international conflict. No prerequisites other than high school algebra. Political Science majors who take this course may not count ECON 159 toward the major. QR, SO

**PLSC 346a, Game Theory and International Relations** Alexandre Debs  
Introduction to game theory and its applications in political science and economics, with a focus on international relations. Standard solution concepts in game theory; case studies from important episodes in the history of international relations, including World War II, the Cuban missile crisis, and the 2003 U.S.-led invasion of Iraq. Recommended preparation: introductory microeconomics. QR, SO

## Comparative Government

\* **PLSC 348a / SAST 343a, Indian Elections and the Media** Divya Devasher  
Introduction to the dynamics of elections in India, including the foundations of democratic politics, the role of political elites, the sources of political differences, and the role of the media to inform and influence outcomes. How voters and politicians make decisions; the role of identity in elections; sources of news that different audiences receive. SO

\* **PLSC 349a / EP&E 472a, Ethnic Conflict** Nicholas Sambanis  
Study of ethnic conflict, focusing on violent forms such as civil wars. Dominant explanations of ethnic conflict; historical case material, policy reports, and news articles from Bosnia, Rwanda, Iraq, Afghanistan, and Syria; analysis of data on ethnic conflict that spans more than fifty years; research from the fields of political science, economics, sociology, and anthropology. Recommended preparation: introductory courses in political science and economics. SO

\* **PLSC 354a / EP&E 250a, The European Union** David Cameron  
Origins and development of the European Community and Union over the past fifty years; ways in which the often-conflicting ambitions of its member states have shaped the EU; relations between member states and the EU's supranational institutions and politics; and economic, political, and geopolitical challenges. SO

**PLSC 359b / GLBL 269b, Violence and Civil Strife** Stathis Kalyvas  
An examination of political violence with an emphasis on civil wars, presently the dominant form of war. SO

\* **PLSC 368b, Global Politics** Stathis Kalyvas  
Major issues in current international politics, from political economy to international security, with a broad geographic focus. Emphasis on analytic and synthetic skills. Themes include the politics of economic crisis, global governance, state failure, and political and economic development. SO



\* **PLSC 372a / EP&E 242a, Politics and Markets** Peter Swenson

Examination of the interplay between market and political processes in different substantive realms, time periods, and countries. Inquiry into the developmental relationship between capitalism and democracy, including the developmental and functional relationships between the two. Investigation of the politics of regulation in areas such as property rights, social security, international finance, and product, labor, and service markets. Topics include the economic motives of interest groups and coalitions in the political process. SO

**PLSC 381a / AFST 381a, Government and Politics in Africa** Katharine Baldwin

The establishment and use of political power in selected countries of tropical Africa. The political role of ethnic and class cleavages, military coups, and the relation between politics and economic development. SO

**PLSC 384a / SAST 244a, Indian Democracy in Comparative Perspective**

Tariq Thachil

Introduction to the major dimensions of Indian democracy; comparison with the political experiences of other developing nations such as China, South Africa, Brazil, and Egypt. Topics include colonial legacies, identity politics, social movements, and social and human development. SO

\* **PLSC 387a / EVST 281a, Resource Management in Canada** Graeme Auld

Canada's historical and contemporary approaches to managing its natural resources. The institutional context of resource governance; changing policies and practices over the past several decades; domestic and international drivers of policy change. Examples from the mining, water, forestry, fisheries, and oil and gas sectors.

\* **PLSC 388b / EVST 303b, Movements, Markets, and Resources** Graeme Auld

Political struggles over the control, management, and use of natural resources in markets. The history of market activism, from boycotts of individual corporations or countries to institutionalized market regulations such as business codes of conduct, public-private partnerships, and certification. Case studies from different countries and market sectors.

\* **PLSC 389b / AFST 389b / GBLB 186b / MMES 181b, Middle East Exceptionalism**

Adria Lawrence

The Middle East and North Africa in comparative perspective. Evaluation of claims that the region's states are exceptionally violent, authoritarian, or religious. Themes include gender, Islam, nation and state formation, oil wealth, terrorism, and war. SO

\* **PLSC 390b / EAST 357b / EP&E 293b, State and Society in Post-Mao China**

Jessica Weiss

State-society relations in the People's Republic of China. Popular protest and social mobilization, media commercialization and the Internet, and prospects for political reform and democratization. SO

\* **PLSC 412a / EP&E 447a, Global Journalism, National Identities** James Sleeper

Changes in the relationship between journalism and nationalism as new technologies, capital flows, and human migrations alter public understandings of political legitimacy. The consequences of these shifts for national identity and liberal public spheres in the United States, Europe, and selected Middle Eastern and Asian nations. Implications for a global public sphere. SO

**PLSC 415b / SOCY 172b, Religion and Politics** Sigrun Kahl

Challenges to the view of religion as an archaic force destined to dwindle away in a secularized society. A historical and comparative investigation of the relationship between religion and politics in Europe and the United States, with comparisons to the Muslim world. so

\* **PLSC 423b / EP&E 243b / GLBL 336b / LAST 423b, Political Economy of Poverty Alleviation** Ana De La O Torres

Overview of classic and contemporary approaches to the question of why some countries have done better than others at reducing poverty. Emphasis on the role of politics. so

\* **PLSC 430a / AFST 420a / EP&E 246a / LAST 406a, The Politics of Development Assistance** David Simon

Study of development assistance, a dominant feature of the political economies of some of the world's poorest countries. The motivations and politics of aid from donors' perspectives; the political and economic impact of aid on developing countries. Proposals to make aid a more effective instrument of development. so

**PLSC 435a / MMES 290a / RLST 290a, Islam Today: Jihad and Fundamentalism** Frank Griffel

Introduction to modern Islam, including some historical background. Case studies of important countries in the contemporary Muslim world, such as Egypt, Iran, Pakistan, and Saudi Arabia. Islam as a reactive force to Western colonialism; the ideals of Shari'a and jihad; violence and self-sacrifice; and Islam as a political ideology. HU

\* **PLSC 436a / GLBL 361a, Violence: State and Society** Matthew Kocher

Examination of large-scale violence, generally within sovereign states. Why violence happens, why it takes place in some locations and not others, why it takes specific forms (insurgency, terrorism, civilian victimization), what explains its magnitude (the number of victims), and what explains targeting (the type or identity of victims). so

**PLSC 439b / GLBL 263b, Challenges of Young Democracies** Ana De La O Torres

Challenges faced by young democracies, such as organizing free and fair elections, controlling government corruption, building an accountable system of governance, sustaining development, and curtailing conflict and violence. Factors that lead to the consolidation of democratic politics or to stagnation and a return to nondemocratic political systems. so

\* **PLSC 442a or b / EP&E 481a or b / SAST 341a or b, Development in South Asia** Staff

Introduction to issues surrounding political and economic development in South Asia. Successes and failures of modernization, including the influence of intellectual trends and their derivative policy prescriptions. Foundational perspectives on development and the policies they yielded; empirical treatments of the experiences of South Asian countries in the postcolonial era. so

\* **PLSC 446b / EP&E 258b / SOCY 369b, Welfare States across Nations** Sigrun Kahl

How different societies counterbalance capitalism and deal with social risks. Welfare state regimes and their approaches to inequality, unemployment, poverty, illness, disability, child rearing, and old age. Why the United States has an exceptionally small welfare state. so

\* **PLSC 447b / AFST 447b / EP&E 271b / ER&M 271b, The Rwandan Genocide in Comparative Context** David Simon

An examination of the 1994 Rwandan genocide: historical sources of the conflict, the motivations of the killers, actions and reactions of outside actors, efforts to reconstruct a post-genocide society, and continuation of the genocidal dynamic within the Great Lakes region. Consideration of other countries in similar situations, as well as other genocides in recent decades. SO

\* **PLSC 457b / EP&E 294b / GLBL 338b, Social Welfare and Nongovernmental Organizations** Katharine Baldwin

The role of nonstate actors such as religious organizations, community associations, and international NGOs in the delivery of basic goods and services in developing countries. Welfare states in Europe and North America and reasons why states outside these regions have not developed similar institutions; causes of and logic behind various nonstate actors' involvement in social welfare provision; economic, institutional, and political effects of having nonstate actors provide social services and public goods. SO

## Statistical and Mathematical Methods

**PLSC 452a / EP&E 203a / STAT 102a, Introduction to Statistics: Political Science**

Jonathan Reuning-Scherer and Alan Gerber

Statistical analysis of politics, elections, and political psychology. Problems presented with reference to a wide array of examples: public opinion, campaign finance, racially motivated crime, and public policy. QR

**PLSC 453a / EP&E 209a / STAT 103a, Introduction to Statistics: Social Sciences**

Jonathan Reuning-Scherer

Descriptive and inferential statistics applied to analysis of data from the social sciences. Introduction of concepts and skills for understanding and conducting quantitative research. QR

## Advanced Courses

\* **PLSC 471a and PLSC 472b, Individual Reading for Majors** David Simon

Special reading courses may be established with individual members of the department. They must satisfy the following conditions: (1) a prospectus describing the nature of the program and the readings to be covered must be approved by both the instructor and the director of undergraduate studies; (2) the student must meet regularly with the instructor for an average of at least two hours per week; (3) the course must include a term essay, several short essays, or a final examination; (4) the topic and/or content must not be substantially encompassed by an existing undergraduate or graduate course. All coursework must be submitted no later than the last day of reading period.

\* **PLSC 474b, Directed Reading and Research for Junior Intensive Majors**

David Simon

For juniors preparing to write yearlong senior essays as intensive majors. The student acquires the methodological skills necessary in research, identifies a basic reading list pertinent to the research, and prepares a research design for the project. All coursework must be submitted no later than the last day of reading period.

\* **PLSC 480a or b, One-Term Senior Essay** David Simon

For seniors writing the senior essay who do not wish, or are unable, to write the essay in a department seminar. Students must receive the prior agreement of a member of the department who will serve as the senior essay adviser, and must arrange to meet with that adviser on a regular basis throughout the term.

\* **PLSC 490a, The Senior Colloquium** Greg Huber

Presentation and discussion of students' research proposals, with particular attention to choice of topic and research design. Each student frames the structure of the essay, chooses research methods, begins the research, and presents and discusses a draft of the introductory section of the essay. Enrollment limited to Political Science majors writing a yearlong senior essay.

\* **PLSC 491b, The Senior Essay** David Simon

Each student writing a yearlong senior essay establishes a regular consultation schedule with a department member who, working from the prospectus prepared for PLSC 490, advises the student about preparation of the essay and changes to successive drafts. Enrollment limited to Political Science majors writing a yearlong senior essay.

\* **PLSC 493b, Senior Essay for Intensive Majors** David Simon

Each student in the intensive major establishes a regular consultation schedule with a department member who, working from the prospectus prepared for PLSC 490, advises the student about preparation of the essay and changes to successive drafts, as well as reporting the student's progress until submission of the final essay. Enrollment limited to Political Science intensive majors.

## Portuguese

Director of undergraduate studies: K. David Jackson, 82–90 Wall St., 432-1158, [k.jackson@yale.edu](mailto:k.jackson@yale.edu); [span-port.yale.edu](http://span-port.yale.edu)

Portuguese is taught at Yale as part of the Department of Spanish and Portuguese; the names of departmental faculty members teaching Portuguese courses appear in the faculty list under Spanish (p. 648).

The major in Portuguese is a liberal arts major intended to develop competence in the Portuguese language and to provide students with a comprehensive knowledge of the literatures and cultures of Portugal, Brazil, and African and Asian lands of Portuguese language or influence.

Students begin the study of Portuguese with PORT 110 or 112. After two years of Portuguese language study, students have sufficient proficiency to take advanced courses in Luso-Brazilian literature and culture.

The standard major, for which the prerequisite is PORT 140 or the equivalent, consists of twelve term courses. Students must take at least two term courses each in the literatures of Portugal and of Brazil. In completing their programs, students may elect up to four courses in other languages and literatures, anthropology, history, or history of art, or from study abroad, that are related to their field of study and approved by the director of undergraduate studies. Juniors and seniors majoring in Portuguese may, with the permission of the instructor and the director of graduate studies, enroll in graduate courses in Portuguese.

**Senior requirement** All majors must either present a senior essay or take the departmental examination. The essay is written in PORT 491 or 492. A maximum of two credits counts toward the major. The examination is both written and oral and covers three periods of Portuguese and Brazilian literatures.

**Placement** All students who have not yet taken Portuguese at Yale are expected to take the departmental placement test, with the exception of students who have no previous knowledge of Portuguese whatsoever. The departmental placement test covers reading, writing, speaking, and listening skills. The placement test will be given at the beginning of the fall and spring terms; see the Center for Language Study Web site (<http://cls.yale.edu/placement-testing>) and the departmental Web site (<http://span-port.yale.edu>) for details.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** PORT 140 or equivalent

**Number of courses** 12 term courses beyond prereq (incl senior essay course, if elected)

**Distribution of courses** At least 2 courses in lit of Portugal, 2 in lit of Brazil

**Substitution permitted** With DUS permission, up to 4 relevant courses from other depts or from study abroad

**Senior requirement** Senior essay (PORT 491 or 492) or dept exam

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## Courses

### **PORT 110a, Elementary Portuguese I** Staff

Basic vocabulary and fundamentals of grammar through practice in speaking, reading, and writing, with stress on audio-lingual proficiency. Introduces Brazilian and Portuguese culture and civilization. Credit only on completion of PORT 120. L1 RP 1½ Course cr

### \* **PORT 112a, Elementary Portuguese for Romance Language Speakers I** Staff

A comprehensive Portuguese course for students proficient in Spanish or another Romance language. Basic vocabulary and fundamentals of grammar through practice in speaking, reading, and writing. Includes laboratory practice. *Conducted in Portuguese.* Credit only on completion of PORT 122b. L1 RP 1½ Course cr

### **PORT 120b, Elementary Portuguese II** Staff

Continuation of PORT 110. To be followed by PORT 130. Prerequisite: PORT 110. Qualifies students for summer study abroad. L2 RP 1½ Course cr

### **PORT 130a, Intermediate Portuguese I** Marta Almeida

Contemporary and colloquial usage of Portuguese in the spoken and written language of Brazil. Grammar review and writing practice. Readings on Brazilian society and history are used to build vocabulary. Exercises develop students' oral command of the language. L3 RP 1½ Course cr

### **PORT 140b, Intermediate Portuguese II** Staff

Continuation of PORT 130. Grammar review, conversation, cultural topics, and readings from Brazilian literature. Prerequisite: PORT 130. L4 RP 1½ Course cr

### **PORT 222b, Narratives of Memory** Selma Vital

The description and organization of memories, both real and fictional, in Brazilian literature. Processing and selecting memories, retelling the past as redemption, using

the past to make sense of the present, the power of testimony, and the role of nostalgia. Readings from fiction and from biographical and historical narratives, with some attention to other art forms such as film, music, and painting. L5

**PORT 246b / LAST 245b / SPAN 245b, Latin American Film: Brazil, Mexico, and Argentina** Paulo Moreira

An overview of the best cinema produced in Brazil, Mexico, and Argentina; survey of recent films by influential directors from these countries. Comparative discussion of cultures, using the contexts of film production and content. Conducted in English. HU

\* **PORT 249a or b, Current Issues in Brazilian Culture** Paulo Moreira

Introduction to current cultural issues in Brazil, with an overview of the country's music, art, dance, theater, literature, and cinema. Source materials include literary and nonliterary texts in Portuguese, Web pages, music, and films. Conducted in Portuguese. L5, HU

\* **PORT 250a, A Century of Brazilian Fiction** Paulo Moreira

Brazilian fiction from 1890 to the present explored through major novels and short stories of the period. Narrative structure and expressive qualities of the texts; literary currents; social, psychological, and existential themes in Latin America. Readings include works by Machado de Assis, Mário de Andrade, Graciliano Ramos, Guimarães Rosa, Clarice Lispector, and Rubem Fonseca. Prerequisite: PORT 140 or equivalent. L5, HU

\* **PORT 300b, The Short Story: Major Authors** K. David Jackson

Close reading of modern short stories by major authors writing in Portuguese, with an emphasis on Brazilian literature. Dominant critical and thematic currents; analysis of social forces. Prerequisite: PORT 140 or equivalent. L5, HU

\* **PORT 370b, Avant-Gardes in Iberia and Latin America** K. David Jackson

Comparative study of Iberian and Latin American avant-garde movements and figures during the first half of the twentieth century, including their intellectual, aesthetic, and social projects. Early formation of the movements across literature and the arts; changing perspectives resulting from contact with other European avant-gardes. Documentation from the plastic arts, music, science and invention, and literature. Prerequisites: PORT 140 and SPAN 140 or equivalents. L5 TR

**PORT 393b / LAST 393b / LITR 231b, Modern Brazilian and Portuguese Fiction in Translation** K. David Jackson

An introduction to major writers in modern Brazilian and Portuguese literatures, including J. M. Machado de Assis, Clarice Lispector, João Guimarães Rosa, Fernando Pessoa, and José Saramago. Conducted in English. WR, HU TR

\* **PORT 394a / LAST 394a / LITR 294a, World Cities and Narratives**

K. David Jackson

Study of world cities and selected narratives that describe, belong to, or represent them. Topics range from the rise of the urban novel in European capitals to the postcolonial fictional worlds of major Portuguese, Brazilian, and Spanish American cities. Conducted in English. WR, HU TR

[ **PORT 396, Modern Brazilian Literature in Translation** ]

**\* PORT 410a / LITR 291a, The Brazilian Short Story in Translation**

K. David Jackson

The Brazilian short story from Machado de Assis to the present, confronting the European literary background with Brazilian linguistic, indigenous, and cultural realities. Authors from four literary periods, including Guimarães Rosa and Clarice Lispector, and dominant critical and thematic currents. Conducted in English. WR, HU TR

**\* PORT 471a and PORT 472b, Directed Reading or Directed Research**

K. David Jackson

Individual study for qualified students under the supervision of a faculty member selected by the student. Approval of the director of undergraduate studies is required.

**\* PORT 491a or b and PORT 492a or b, The Senior Essay** K. David Jackson

A research project designed under a faculty director, resulting in a substantial paper written in Portuguese, submitted to the DUS and a second designated reader.

## Psychology

Director of undergraduate studies: Laurie Santos, 213 SSS, 432-4524,  
psychdus@yale.edu; psychology.yale.edu

### FACULTY OF THE DEPARTMENT OF PSYCHOLOGY

**Professors** Woo-kyoung Ahn, Stephen Anderson, Amy Arnsten, John Bargh, Paul Bloom, Thomas Brown, Tyrone Cannon, Joseph Chang, Marvin Chun, Margaret Clark, Ravi Dhar, John Dovidio, Carol Fowler (*Adjunct*), Tamar Gendler, Jeannette Ickovics, Marcia Johnson, Jutta Joormann, Dan Kahan, Alan Kazdin, Frank Keil, Joshua Knobe, Marianne LaFrance, Linda Mayes, Gregory McCarthy, Nathan Novemsky, Peter Salovey, Brian Scholl, Jane Taylor, Tom Tyler, Fred Volkmar, Victor Vroom, Karen Wynn

**Associate Professors** Robert Kerns, Jr., Maria Piñango, Laurie Santos, Mary Schwab-Stone

**Assistant Professors** Steve Chang, Yarrow Dunham, Avram Holmes, Hedy Kober, Jaime Napier, David Rand, Gregory Samanez-Larkin

**Lecturers** Nancy Close, Nelson Donegan, Carla Horwitz, David Klemanski, Kristi Lockhart, Mary O'Brien, Matthias Siemer, Benjamin Toll, Marney White

The introduction to psychology is PSYC 110, a general survey course. PSYC 110 is a prerequisite for other 100-level courses only if indicated in their course descriptions; it is a prerequisite for all courses numbered 200 or above.

Courses in the department are organized so that they are best taken in several parallel sequences. Courses numbered from 120 to 190 and ending in a zero are core survey courses that introduce students to major areas of psychology and provide additional background for more advanced courses. These courses represent major content areas of psychology; students should sample broadly from them before specializing. Courses numbered from 200 to 209 focus on statistics and general methodology. Courses numbered from 210 to 299 teach data collection in various areas of psychology. Courses numbered from 300 to 399 are more advanced courses in a particular specialization.

Senior seminars, whose enrollment is limited to twenty students, are numbered from 400 to 489. These seminars are best taken once a student has appropriate background. Courses numbered from 490 to 499 are special tutorial courses that require permission of the adviser and the director of undergraduate studies.

**The standard major** The major in Psychology requires twelve term courses beyond PSYC 110, including the senior requirement.

1. Because psychology is so diverse a subject, every student is required to take four courses from the list below. Two of these courses must be from the social science point of view in psychology and two must be from the natural science point of view. At least one from each group must be a course designated as "Core" in the course listings. Students are expected to take their two core courses as early as possible in the major, normally within two terms after declaring their major.

*Social science:* PSYC 125, 126, 127, 128, 140, 150, 152, 180, 181, 232L, 250, 280L, 315, 319, 325, 330, 332, 342, 355

*Natural science:* PSYC 120, 130, 137, 147, 149, 160, 161, 163, 170, 171, 190, 191, 230, 260, 270, 304, 318, 320, 321, 322, 327, 329, 331, 337, 350, 360, 371, 376

2. Because statistical techniques and the mode of reasoning they employ are fundamental in psychology, a course in statistics (PSYC 200) is required, preferably prior to the senior year. A student may substitute STAT 103 for PSYC 200 or may substitute an examination arranged with the instructor of PSYC 200 for the course requirement. Students may take the examination only one time.
3. To assure some direct experience in collecting and analyzing data, students must elect at least one course, preferably prior to the senior year, in which research is planned and carried out. Courses numbered between 210 and 299 fulfill this research methods requirement.
4. To encourage consideration of the relation between psychology and other disciplines, students may, with permission of the director of undergraduate studies, count up to three term courses in other related departments toward the major. Students should consult with the director of undergraduate studies in Psychology about selecting outside courses. Appropriate courses are typically offered in anthropology, cognitive science, philosophy, political science, and the biological sciences. Some students may find courses in other subjects related to their major.

Students interested in research are encouraged to take an independent study course (PSYC 490, 491, 492, 493) as early as the sophomore year. Students may also take PSYC 495 for one-half course credit of independent research per term with prior permission of the faculty adviser and the director of undergraduate studies. No more than a total of three credits from PSYC 490–495 combined may count toward the major.

**B.S. degree** The B.S. degree is typically awarded to students who conduct empirical research through a directed research course. B.S. candidates must fulfill the statistics and research methods requirements of the major before starting the senior year. An



empirical research project normally includes designing an experiment and collecting and analyzing the data.

**B.A. degree** The B.A. degree is typically awarded to students who conduct a nonempirical literature review. There are no restrictions in the research format for the B.A.

**Senior requirement** Majors are required to earn two course credits from courses numbered PSYC 400–495. At least one of these course credits must be taken during the senior year and, for the B.S. degree, at least one must be a directed research course (PSYC 492 or 493) taken during the senior year. Juniors may preregister for senior seminars at the end of the junior year. In order to count credits obtained from PSYC 400–495 toward the senior requirement, a student must submit a substantial final paper (a minimum of 20 pages for a one-credit course, 10 pages for a half-credit course).

**Credit/D/Fail** No more than two term courses taken Credit/D/Fail may be applied toward the major; no 200-level course taken Credit/D/Fail may be applied toward the major.

**Departmental advisers** Schedules for all majors must be discussed with, and approved by, the director of undergraduate studies or the adviser for the neuroscience track in Psychology. Only then may a schedule be submitted to the residential college dean's office. For questions concerning credits for courses taken at other institutions or at Yale but outside the Department of Psychology, students should consult with the director of undergraduate studies. For questions concerning special tracks, students should consult with the director of undergraduate studies or the adviser for the neuroscience track in Psychology.

**Distinction in the Major** To be considered for a B.S. degree with Distinction, a student must first submit a research proposal of one to two single-spaced pages, signed by the senior essay adviser, by the end of the registration period in the fall term of the senior year. The proposal must specify a research hypothesis, a rationale for the hypothesis, and proposed methods for collecting and analyzing data.

To be considered for a B.A. degree with Distinction, a student must first submit a senior essay proposal of one to two pages, signed by the essay adviser and specifying the research topic, by the end of the registration period in the fall term of the senior year.

Additionally, to be considered for Distinction in the Major with either degree, students must submit a senior essay to the Psychology department at least one week before the last day of classes in the final term of enrollment. The senior essay must be written during the senior year and must be a product of one or two of the 400-level courses taken to fulfill the senior requirement. Senior essays that are submitted after the deadline will be subject to grade penalties.

**Computer Science and Psychology major** The interdepartmental major in Computer Science and Psychology may be considered by students with interests lying squarely between the two disciplines. See under Computer Science and Psychology (p. 218) for more information.

**Neuroscience track in Psychology** Students with a major interest in neuroscience may wish to elect the neuroscience track. Such students are considered Psychology majors for whom the requirements have been modified to accommodate their interests, and to reflect the multidisciplinary nature of modern neuroscience and psychology. Given the broad nature of the field of neuroscience, students may wish to concentrate their studies in one area of the field (e.g., behavioral, cellular and molecular, cognitive, affective, social, clinical, or developmental). Interested students are encouraged to meet with the track adviser, Gregory Samanez-Larkin, 318 SSS, 432-1150, g.samanezlarkin@yale.edu. Majors in the neuroscience track meet with the track adviser at the beginning of each term in their junior and senior years.

Requirements for the neuroscience track are the same as for the standard major, with the following exceptions:

1. Two terms of introductory biology are required for the major, either MCDB 120 or BIOL 101 and 102, and either E&EB 122 or BIOL 103 and 104. Students who have scored 5 on the Advanced Placement test in Biology may place out of these courses.
2. Students must take PSYC 160 or 170 and a data-collection course chosen from PSYC 230L, 260, or 270. MCDB 320 may substitute for the PSYC 160 or 170 requirement, or MCDB 320 and 321L may substitute for the PSYC 230L, 260, or 270 requirement, but not both. If MCDB 320 is substituted for a Psychology course, it cannot be counted as one of the two advanced science courses outside the department (see item 4 below).
3. As required for the standard major, students in the neuroscience track must take two courses from the social science list above, at least one of which must be designated as "Core" in the course listings. Students in the neuroscience track must also take a course from the natural science list in addition to the courses specified in item 2 above.
4. At least two advanced science courses must be chosen from Molecular, Cellular, and Developmental Biology and Ecology and Evolutionary Biology courses numbered 200 and above that deal with human and/or animal biology; recommended courses include MCDB 200, 202, 205, 210, 240, 300, 315, 320, E&EB 220, 225, and 240. Certain courses outside of these departments may also meet the advanced science requirement, including BENG 350, 421, CPSC 475, MB&B 300, 301, 420, 435, 443, 452, MATH 222, 225, 230, 231, and STAT 241. Other courses may qualify for this requirement with permission of the neuroscience track adviser. Laboratory courses do not count toward the advanced science requirement. Students should note that many advanced science courses have prerequisites that must be taken first.
5. The senior requirement for the neuroscience track is the same as for the standard major, except that the two required course credits from PSYC 400–495 must have neuroscience content. Students pursuing the B.S. degree in the track must carry out a neuroscientific empirical project in PSYC 492 or 493 and must be supervised by a faculty member within the neuroscience area of the Psychology department. Students who wish to work with an affiliated faculty member studying neuroscience outside the department must obtain permission from the neuroscience track adviser.

## REQUIREMENTS OF THE MAJOR STANDARD MAJOR

**Prerequisite** PSYC 110

**Number of courses** 12 courses beyond prereq (incl senior req)

**Specific course required** PSYC 200

**Distribution of courses** *B.A.* – 2 social science courses and 2 natural science courses, as specified; 1 course numbered PSYC 210–299; *B.S.* – Same, with completion of the statistics and research methods reqs before senior year

**Substitution permitted** For PSYC 200, STAT 103 or exam arranged with instructor; up to 3 relevant courses in other depts, with DUS permission

**Senior requirement** *B.A.* – 2 course credits from PSYC 400–495, 1 during senior year; *B.S.* – PSYC 492 or 493 taken during senior year; 1 addtl course credit from PSYC 400–495

## NEUROSCIENCE TRACK

**Prerequisite** PSYC 110

**Number of courses** 12 courses beyond prereq (incl senior req)

**Specific courses required** PSYC 160 or 170; PSYC 200; PSYC 230L, 260, or 270

**Distribution of courses** *B.A.* – 2 social science courses and 1 natural science course, as specified; at least 2 advanced science courses, as specified; *B.S.* – Same, with completion of the statistics and research methods reqs before senior year

**Substitution permitted** MCDB 320 for PSYC 160 or 170, or MCDB 320 and 321L for PSYC 230L, 260, or 270; for PSYC 200, STAT 103 or exam arranged with instructor

**Senior requirement** *B.A.* – 2 course credits from PSYC 400–495 with neuroscience content, 1 during senior year; *B.S.* – PSYC 492 or 493 taken during senior year, with neuroscience content in research project; 1 addtl course credit from PSYC 400–495 with neuroscience content

## Courses

**PSYC 110a or b, Introduction to Psychology** Staff

A survey of major psychological approaches to the biological, cognitive, and social bases of behavior. SO

\* **PSYC 125a / CHLD 125a / EDST 125a, Child Development**

Nancy Close and Carla Horwitz

The reading of selected material with supervised participant-observer experience in infant programs, a day-care and kindergarten center, or a family day-care program. Regularly scheduled seminar discussions emphasize both theory and practice. An assumption of the course is that it is not possible to understand children – their behavior and development – without understanding their parents and the relationship between child and parents. The focus is on infancy as well as early childhood.

Enrollment limited to juniors and seniors. WR, SO

Psychology: Social Science

**PSYC 126a, Attraction and Relationships** Margaret Clark

Theory and empirical research on the antecedents and consequences of attraction, and on intra- and interpersonal processes that either facilitate or interfere with the

formation and maintenance of close relationships. Methodological bases for rigorous study of these topics. SO

Psychology: Social Science

**\* PSYC 127a / CHLD 127a / EDST 127a, Theory and Practice of Early Childhood**

**Education: Implications of Curriculum and Policy** Carla Horwitz

Development of curricula for preschool children—infants through five-year-olds—in light of current research and child development theory. WR, SO RP

Psychology: Social Science

**\* PSYC 128b / CHLD 128b / EDST 128b, Language, Literacy, and Play**

Nancy Close and Carla Horwitz

The complicated role of play in the development of language and literacy skills among preschool-aged children. Topics include social-emotional, cross-cultural, cognitive, and communicative aspects of play. WR, SO RP

Psychology: Social Science

**PSYC 130a / CGSC 110a, Introduction to Cognitive Science** Brian Scholl

An introduction to the interdisciplinary study of how the mind works. Discussion of tools, theories, and assumptions from psychology, computer science, neuroscience, linguistics, and philosophy. SO

Psychology: Core

Psychology: Natural Science

**PSYC 140a, Developmental Psychology** Frank Keil

An introduction to research and theory on the development of perception, action, emotion, personality, language, and cognition from a cognitive science perspective.

Focus on birth to adolescence in humans and other species. Prerequisite: PSYC 110. SO

Psychology: Social Science

Psychology: Core

**PSYC 147a, Animal Models of Clinical Disorders** Nelson Donegan

An interdisciplinary approach to understanding and treating psychiatric disorders, integrating clinical psychology, psychiatry, and advances in basic neuroscience. Focus on how research with animal models can advance our understanding of psychiatric disorders and generate more effective treatments for patients. Topics include drug addiction, depression, Parkinson's disease, and schizophrenia. SC, SO

Psychology: Natural Science

**PSYC 150b, Social Psychology** Marianne LaFrance

Study of social cognition, attitudes and persuasion, group processes, intergroup processes, prosocial behavior, aggression, and conformity. Theories, methodology, and applications of social psychology. Prerequisite: PSYC 110. SO

Psychology: Core

Psychology: Social Science

**PSYC 160a, The Human Brain** Gregory McCarthy

Introduction to the neural bases of human psychological function, including social, cognitive, and affective processing. Preparation for more advanced courses in cognitive and social neuroscience. Topics include memory, reward processing, neuroeconomics, individual differences, emotion, social inferences, and clinical disorders. Neuroanatomy, neurophysiology, and neuropharmacology are also introduced. SC

Psychology: Core

## Psychology: Natural Science

**\* PSYC 161b, Drugs, Brain, and Behavior** Hedy Kober

Psychoactive drugs and their effects on both brain and behavior. Pharmacological and brain mechanisms of different classes of legal, illegal, and medicinal drugs, including alcohol, caffeine, tobacco, stimulants, depressants, antidepressants, and hallucinogens. Individual drugs' pharmacokinetics, mechanisms of action, dosing, routes of administration, and patterns and effects of use and misuse. Some attention to substance use disorders, prevention, and treatment. SC

**PSYC 171b, Sex, Evolution, and Human Nature** Laurie Santos

Consideration of human behavior in a broad evolutionary context. Topics include basic evolutionary theory, human mating strategies, the biology of warfare, sex differences in behavior, love and lust, the evolution of morality, and the role of language and culture. SO

**PSYC 180b, Abnormal Psychology** Jutta Joormann

The major forms of psychopathology that appear in childhood and adult life. Topics include the symptomatology of mental disorders; their etiology from psychological, biological, and sociocultural perspectives; and issues pertaining to diagnosis and treatment. SO

**PSYC 182b / CGSC 282b / PHIL 182b, Perspectives on Human Nature** Joshua Knobe

Comparison of philosophical and psychological perspectives on human nature. Nietzsche on morality, paired with contemporary work on the psychology of moral judgment; Marx on religion, paired with systematic research on the science of religious belief; Schopenhauer paired with social psychology on happiness. HU

**PSYC 190a, Introduction to Clinical Neuroscience** Tyrone Cannon

The biological bases of psychopathology, with attention to the interplay of biological and psychological factors. Research and theory regarding the role of biological influences such as genetics, neuronal physiology and signaling, and psychopharmacology in the major classes of mental disorders. Discussion of mood and anxiety disorders, schizophrenia, addictions, personality disorders, eating disorders, and autism. SC

**PSYC 191b, The Biological Basis of Personality** Avram Holmes

Major discoveries in the biological basis of human personality. The history of personality theory; evolutionary theories of personality; heritability; genetic architecture; personality's relations to the brain, to psychiatric illness, and to morality and criminality; cultural and gender differences; personality over the lifespan. Prerequisite: PSYC 110. SO

**PSYC 200b, Statistics** Jaime Napier

Measures of central tendency, variability, association, and the application of probability concepts in determining the significance of research findings. QR

**PSYC 230Lb, Research Methods in Human Neuroscience** Gregory McCarthy

Methods of human neuroscience research. Focus on functional magnetic resonance imaging, electroencephalography, and evoked potentials. Students design experiments, acquire data, and perform analyses. Extensive use of MATLAB. Prerequisites: PSYC 160 or 170 and a course in statistics, or permission of instructor. SC

**\* PSYC 232La, Research Methods in Social Decision Making** David Rand  
Methods of research in social interaction and decision making. Game theory, economic modeling, and evolutionary modeling applied to experimental psychology. Students design and conduct a research study, analyze the data, and write a research report.

Prerequisites: PSYC 110 and a course in statistics, or with permission of instructor.

Recommended preparation: research experience. Enrollment limited. SO

Psychology: Social Science

Psychology: ResearchMethods

**\* PSYC 235a, Research Methods in Psychology** Woo-kyoung Ahn

Introduction to general principles and strategies of psychological research. Topics include generating and testing hypotheses, laboratory and field experiments, scale construction, sampling, archival methods, case studies, ethics and politics of research, and Internet and cross-cultural methods. Hands-on research experience in laboratories.

Prerequisites: PSYC 200 or STAT 103, or permission of instructor. WR, SO

**PSYC 250a, Research Methods in Clinical Psychology** Arielle Baskin-Sommers

Introduction to the underpinnings, processes, and methods of scientific research utilized in clinical psychology. Rationale for various methods, generating and testing hypotheses, nonhuman animal models, laboratory and applied studies, assessment methods, ethical issues, protection of participants, and research findings in relation to public life and policy. SO

Psychology: ResearchMethods

Psychology: Social Science

**\* PSYC 270b, Research Methods in Behavioral Neuroscience** Nelson Donegan

Laboratory course in which students design and conduct research to study brain function and behavior. Emphasis on hands-on participation in behavioral and neuroscience techniques. Prerequisites: PSYC 160 or 170, and a course in statistics, or with permission of instructor. SC

Psychology: ResearchMethods

Psychology: Natural Science

**PSYC 315b / CGSC 315b, The Modern Unconscious** John Bargh

The notion of the unconscious mind traced from the early 1800s through Freud to present-day cognitive science, with a focus on the past thirty years. The power and function of the unconscious as a pervasive part of normal everyday human functioning.

Readings from philosophy of mind and evolutionary biology. SO

**PSYC 318b / LING 220b, General Phonetics** Staff

Investigation of possible ways to describe the speech sounds of human languages.

Acoustics and physiology of speech; computer synthesis of speech; practical exercises in producing and transcribing sounds. (Formerly LING 120) SO

Psychology: Natural Science

**\* PSYC 319b / HLTH 215b, Health Psychology** Benjamin Toll

An introduction to health behaviors and ways in which they can be altered. Health-compromising behaviors such as the use of alcohol, drugs, and tobacco; the impact of health psychology on problems such as stress, pain management, AIDS, and cancer.

SO

Psychology: Social Science

**PSYC 321b, Psychopharmacology** Thomas Brown

Study of therapeutic and recreational drugs that affect the central nervous system and influence mood, cognition, perception, and behavior. Drugs considered vary from psychotropic to hypnotic to narcotic. Prerequisite: PSYC 160 or <170> or equivalent, or permission of instructor. SC  
Psychology: Natural Science

**PSYC 327b / LING 227b, Language and Computation** Gaja Jarosz

Design and analysis of computational models of language. Topics include finite state tools, computational morphology and phonology, grammar and parsing, lexical semantics, and the use of linguistic models in applied problems. Prerequisite: Prior programming experience or permission of instructor. (Formerly LING 141) QR, SO  
Psychology: Natural Science

**PSYC 330a, Psychology and the Law** Kristi Lockhart

Contributions of psychological theory and research to our understanding of the law and the criminal justice system. Topics include criminality, eyewitness testimony, lie detection, jury decision making, the death penalty, the insanity defense, civil commitment, prisons, repressed memories, children as witnesses and defendants, and the role of psychologists as expert witnesses and trial consultants. SO  
Psychology: Social Science

**\* PSYC 350a or b, Autism and Related Disorders** Staff

Weekly seminar focusing on autism and related disorders of socialization. A series of lectures on topics in etiology, diagnosis and assessment, treatment and advocacy, and social neuroscience methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, residence, or treatment setting for individuals with autism spectrum disorders. Details about admission to the course are explained at the first course meeting. Prerequisite: an introductory psychology course. SO

Psychology: Natural Science

**\* PSYC 355a, Clinical Psychology in the Community** Kristi Lockhart

Mental disorders as they are treated within a community setting. Students participate in a fieldwork placement, working either one-on-one or in groups with the psychiatrically disabled. Seminar meetings focus on such topics as the nature of severe mental disorders, the effects of deinstitutionalization, counseling skills, and social policy issues related to mental health. Prerequisite: PSYC 180 or permission of instructor. SO  
Psychology: Social Science

**PSYC 376a, Learning and Memory** Thomas Brown

The basic facts, general principles, and theories that describe how higher animals, from mice to humans, are changed by their experiences. The historically separate fields of learning and memory research desegregated under a neuroscientific perspective that recognizes the evolutionary continuity among higher animals. Prerequisites: introductory courses in biology and psychology, or permission of instructor. SC, SO  
Psychology: Natural Science

**\* PSYC 402b, Topics in Infant Studies** Karen Wynn

Advanced topics in infant cognitive, social, and emotional development. Attention to infant attachment strategies as well as maternal and paternal investment and

attachment. Perspectives from biology, anthropology, and developmental, comparative, clinical, physiological, and evolutionary psychology. so

**\* PSYC 411b, Intro to Systems Neuroscience** Wohn Chang

This course provides an overview of the fundamental principles governing the central nervous system. Topics include the anatomy of the central nervous system, the neural mechanisms underlying cortical and subcortical control of behavior, various neuroscience techniques, as well as implications for nervous system disorders. The lectures will combine basic knowledge of the nervous system with the key experimental findings that led to new discoveries in brain function. sc

**\* PSYC 414a / WGSS 466, Gender Images: A Psychological Perspective**

Marianne LaFrance

The nature and effects of gender images (males and females, sexual orientation, gender identities) on the construction of self-identity, stereotypes, aspirations, and interpersonal relationships. Focus on contemporary media, with attention to how, when, and why gender images change with time. so

**\* PSYC 423a / CGSC 423a, Cognitive Science of Good and Evil** Paul Bloom

Feelings and sentiments that relate to morality, including empathy, disgust, anger, shame, guilt, envy, lust, and love. The evolution of such moral emotions, ways in which they are influenced by culture, and whether they are reliable guides to moral thought and action. Perspectives from philosophy, social and developmental psychology, evolutionary biology, theology, and law. so

**\* PSYC 425b, Social Perception** Brian Scholl

Connections between visual perception, among the earliest and most basic of human cognitive processes, and social cognition, among the most advanced forms of higher-level cognition. The perception of animacy, agency, and goal-directedness; biological motion; face perception (including the perception of facial attractiveness); gaze processing and social attention; "thin-slicing" and "perceptual stereotypes"; and social and cultural influences on perception. so

**\* PSYC 454b, Sensory Information Processing** Lawrence Marks

A functional examination of the ways that sensory systems transduce stimulus energies and information. Topics include sensory anatomy and physiology, psychophysical analysis of the qualitative dimensions of sensory experience, selective attention, and interactions among sensory, perceptual, and cognitive mechanisms. sc, so

**\* PSYC 458a, Decision Neuroscience** Gregory Samanez-Larkin

The decision-making process examined from the perspective of neuroscience. Research from cognitive neuroscience, psychology, public health, behavioral economics, finance, marketing, and computer science. Topics include reinforcement learning, risky decision making, intertemporal choice, social decision making, impulsivity and self control, development and aging, psychopathology, and commercial and public health applications. so

**\* PSYC 477b, Psychopathology and the Family** Kristi Lockhart

The influence of the family on development and maintenance of both normal and abnormal behavior. Special emphasis on the role of early childhood experiences. Psychological, biological, and sociocultural factors within the family that contribute to variations in behavior. Relations between family and disorders such as schizophrenia,



depression, anorexia nervosa, and criminality. Family therapy approaches and techniques. SO

**\* PSYC 490a and PSYC 491b, Directed Reading** Laurie Santos

Individual study for qualified students who wish to investigate an area of psychology not covered by regular departmental offerings. A student must be sponsored by a faculty member, who sets requirements and meets regularly with the student. To register, the student must submit a written plan of study approved by the adviser to the director of undergraduate studies. The normal minimum requirement is a term paper, but individual faculty members may set alternative equivalent requirements. May be elected for one or two terms.

**\* PSYC 492a and PSYC 493b, Directed Research** Laurie Santos

Empirical research projects for qualified students, primarily seniors. A student must be sponsored by a faculty member, who sets the requirements and supervises research. To register, the student must submit a written plan of study approved by the adviser to the director of undergraduate studies. The normal minimum requirement is a written report of the completed research, but individual faculty members may set alternative equivalent requirements. May be elected for one or two terms.

**\* PSYC 495a or b, Research Topics** Laurie Santos

Discussion and/or individual study of current topics or ongoing research projects. A student must be sponsored by a faculty member, who sets the requirements and supervises the coursework. Requirements can include attending lab meetings, performing research with a faculty member, or writing a final paper. To register, the student must submit a written plan of study approved by the faculty sponsor to the director of undergraduate studies. May be repeated for credit. ½ Course cr

## Public Health

For information about Yale College course offerings related to health, see under Global Health Studies (p. 390).

**The five-year B.A.–B.S./M.P.H. degree program** The B.A.–B.S./M.P.H. degree program in Public Health gives Yale College students interested in the field of public health the opportunity to earn a bachelor's degree from Yale College and an M.P.H. degree from the Yale School of Public Health in a five-year joint program. During four years of Yale College enrollment, students complete a standard Yale College major and six course credits applicable toward the M.P.H. degree. Students complete a public health internship between the fourth and fifth years of the program and study at the School of Public Health (YSPH) full time in the fifth year, when they fulfill the remaining program requirements for the M.P.H. degree.

Students apply to YSPH for the joint program in the fall term of their junior year. Candidates must present evidence of a commitment to public health, as well as a record of one year of college-level mathematics and either biology, chemistry, or physics. Applicants must complete YSPH application forms and submit transcripts, SAT scores, three letters of recommendation, and a personal statement. Financial aid, if provided during the fifth year, comes from YSPH.

Further information about this program may be obtained on the YSPH Web site (<http://publichealth.yale.edu/admissions/programs/select>).

## Religious Studies

Director of undergraduate studies: Kathryn Lofton, 451 College St., 432-0830, [kathryn.lofton@yale.edu](mailto:kathryn.lofton@yale.edu); [religiousstudies.yale.edu](http://religiousstudies.yale.edu)

### FACULTY OF THE DEPARTMENT OF RELIGIOUS STUDIES

**Professors** Gerhard Böwering, Stephen Davis, Carlos Eire, Steven Fraade, Paul Franks, Bruce Gordon, Philip Gorski, Phyllis Granoff, Frank Griffel, John Hare, Christine Hayes (*Chair*), Bentley Layton, Kathryn Lofton, Ivan Marcus, Dale Martin, Hindy Najman, Sally Promey, Harry Stout, Denys Turner, Robert Wilson

**Associate Professor** Eliyahu Stern

**Assistant Professors** Zareena Grewal, Noreen Khawaja, Andrew Quintman

**Senior Lecturers** John Grim, Stephen Latham, Nancy Levene, Mary Evelyn Tucker

**Lecturers** Hugh Flick, Jr., Margaret Olin, George Syrimis

The study of religion is an interdisciplinary field that employs a wide variety of methods to examine institutions, practices, texts, and ideas. Students learn to understand religion as a form of human thought and activity; develop a familiarity with religions as social movements, textual traditions, sensory cultures, and arbiters of value; and acquire the linguistic, philosophical, and historical acumen necessary for in-depth research.

Students who want a broad introduction to the study of religions can choose courses listed under Groups A or B below, though courses listed under Group C are also open without prerequisite. Religious Studies majors develop specialized concentrations as they plan a major program in consultation with the director of undergraduate studies and other members of the faculty.

Religious Studies course offerings, other than freshman seminars, are arranged in four categories. Group A features general and comparative courses that engage more than one tradition, concept, or text. Group B includes survey courses that provide a broad introduction to a particular religious tradition or scripture in historical context. Group C includes courses on specialized topics in religious studies, both introductory and intermediate. Group D offers advanced courses on specialized topics. Normally, courses in Groups A to C have no prerequisites while courses in Group D have a specific prerequisite or require the permission of the instructor.

**The major** The department offers two programs for students majoring in Religious Studies: the standard major and a major in which religious studies is combined with another subject closely related to the senior essay. Both programs require a core of courses, a seminar, and a two-term senior essay.

**Core requirement** A core of six courses in Religious Studies is required of all majors and should be selected in consultation with the director of undergraduate studies. One core course, normally from Group A, involves the comparative study of religions. Three core courses, normally from Groups B and C, concentrate on the historical or textual

study of three different religious traditions or regions. Students are encouraged to select religions and regions as widely divergent as possible in order to balance in-depth study with global diversity and connection. One core course focuses on systematic thought (ethics, philosophy of religion, or theology). The final core course is RLST 490, the junior seminar on approaches to the study of religion.

**Seminar requirement** Before the end of the junior year, students must complete a seminar (in addition to the junior seminar) that requires a major research paper. In Program I, this seminar must be an elective in Religious Studies. In Program II, it may be a course in Religious Studies, or it may constitute one of the four term courses outside the department.

**Program I. The standard major** Program I consists of twelve term courses in Religious Studies, including the core of six required courses, the two-term senior essay, and four electives. The electives are usually selected from Groups C and D and form a coherent unit to help the student prepare for the senior essay. Certain cognate courses in other departments that are integral to the student's area of concentration may count toward the major with permission of the director of undergraduate studies. Normally the maximum number of cognate courses that may be applied is two. Two terms of an ancient language related to the study of religion may, with permission of the director of undergraduate studies, be counted.

**Program II. Religious studies with another subject** Program II consists of eight term courses in Religious Studies (the core of six required courses and the two-term senior essay) and four term courses outside the department, one of which may fulfill the seminar requirement outlined above. The four courses outside the department need not directly concern religion, but they must form a coherent, focused unit of concentration. Through them students can develop expertise in a methodological approach, cultural area, historical period, or body of literature contributing to the senior essay. Examples of successful combinations might be: four courses in Chinese history, language, and literature with a senior essay topic on Chinese Buddhism; four courses in early American history and literature with a topic on colonial American religion; four courses in a specific area of biology and medical science with a topic on biomedical ethics; four courses in globalization and international relations with a topic on religion and globalization. Each student's petition to take this program will be judged on its contribution to the student's senior essay. Normally, introductory courses in other departments may not count among the outside courses; appropriate language courses at a higher level may. Students electing Program II must, at the end of the junior year and in no case later than the beginning of the senior year, obtain approval for their proposed program from the director of undergraduate studies. Students who think they may elect this program should consult the director of undergraduate studies as early as possible in their studies to begin suitable selection of courses.

**Senior requirement** Students in both programs must write a senior essay under the supervision of a faculty adviser in the student's area of concentration. In selecting a senior essay topic, students normally choose a subject on which they have completed course work before commencing the senior year. The essay counts as two term courses toward the major and is taken in both terms of the senior year. The student should begin choosing a senior essay topic during the second term of the junior year, and early in the first term of the senior year must submit a Statement of Intention approved by

a faculty adviser and the director of undergraduate studies. The senior essay course, RLST 491 and 492, includes research and writing assignments as well as colloquia in which seniors present and discuss their research. The student must submit at least ten pages of the essay to the director of undergraduate studies by the last day of classes in the first term in order to receive a grade of "satisfactory" for that term.

**Courses in the Divinity School** Students in Yale College may take certain courses in the Divinity School, and Divinity School faculty are eligible to advise senior essays. Information about courses and faculty may be found in the Divinity School bulletin (<http://www.yale.edu/printer/bulletin/htmlfiles/div>). Some Divinity School courses may count toward the major, with permission of the director of undergraduate studies.

Students majoring in Religious Studies who plan to do graduate work in the subject are strongly encouraged to study languages of which a reading knowledge will be needed for their graduate program.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 term courses (incl senior req)

**Specific course required** RLST 490

**Distribution of courses** *Both programs*—1 course in comparative religions; 3 courses in historical or textual study of religious traditions, as specified; 1 course in systematic thought, as specified; 1 sem other than junior sem, as specified; *Program I*—4 electives; *Program II*—4 nonintro courses in another subject linked with senior essay, approved by DUS

**Substitution permitted** *Both programs*—Divinity School courses, with DUS permission; *Program I*—2 related courses in other depts, with DUS permission

**Senior requirement** Senior essay (RLST 491, 492)

## Freshman Seminars

\* **RLST 012b / HUMS 092b, Divine Law in Historical Perspective** Christine Hayes  
The relationship between the concepts of religion and law in classical Jewish and Christian thought. Law as a religious expression, a concession to human weakness, or a debasement of the divine-human relationship; reasons for obeying religious and secular law; the relation of law and morality; the impact of historical theological debates over the law's spirit vs. its letter on contemporary, secular legal arguments concerning the value of law. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

\* **RLST 015b, Gods and Heroes in Indian Religions** Phyllis Granoff  
The basic doctrines and practices of India's three classical religions, Buddhism, Jainism, and Hinduism, explored through close reading of texts in translation. Lives of the founders, great monks, nuns, and lay followers of Buddhism and Jainism; myths of the major Hindu gods; heroines and goddesses in the three traditions. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

\* **RLST 016a / HUMS 051a / MGRK 002a, Religion and Literature: Irreverent Texts**

George Syrimis and Hindy Najman

The complex relationship between religion and literature from the nineteenth century to the present. Focus on the Greco-Roman and Judeo-Christian traditions. Modernity and tradition, the legitimacy of ritual, the relationship between church and state, and the reception of antiquity. The emergence of modern discourses of gender and sexuality in light of religious practice and dogma. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

## General, Comparative, and Thematic Courses (Group A)

\* **RLST 110b, Apocalyptic Religion in Cross-Cultural Perspective** Robert Wilson

An examination of millennial and "end-time" beliefs in a variety of cultures around the world. Attention given to Jewish and Christian texts as well as Native American traditions, African and Asian movements, and modern manifestations such as Jonestown and Heaven's Gate. HU

\* **RLST 116b, Monasticism in Comparative Perspective** Stephen Davis

Traditions of monasticism from antiquity to the present. Elements that distinguish monasticism from other kinds of religious and nonreligious practice; types of monastic practice and institutions; monastic literary and artistic traditions; the effects of a monastery's physical setting on the everyday life of its inhabitants; monastic communities' responses to the challenges of modernity. Historical, ethnographic, archaeological, literary, and visual sources. HU

**RLST 195a / AMST 195a, Religion and Technology** Kathryn Lofton

The effects of technological innovation on human life. History of Western technology and its interactive relationship with the history of religions. Focus on the religious meaning of technological innovations, with some attention to historical and material conditions that provide the necessary contexts for the machines, systems, and other technology in a given period. Readings from philosophical, historical, literary, and scientific sources. HU

## Surveys of Religious Traditions (Group B)

**RLST 126a, Tibetan Buddhism** Andrew Quintman

Introduction to major themes in Tibetan Buddhist thought and practice. Buddhist ethics, systems of monastic and ascetic life, ritual applications, sacred geography and pilgrimage, lay religion, and the status of Buddhism in Chinese-occupied Tibet and in the West. HU

**RLST 141a / ARCG 222a / NELC 112a, Egyptian Religion through the Ages**

John Darnell

Diachronic approach to topics in Egyptian religion. Religious architecture, evidence for protodynastic cults, foreigners in Egyptian religious celebrations, music and vocal expression in Egyptian religion, Re and Osiris, the Amarna interlude and the Ramesside solar religion, and the goddess of the eye of the sun. Readings in translation. HU

**RLST 145a / HUMS 349a / JDST 110a, The Bible** Christine Hayes

The writings common to both Jewish and Christian scripture examined as diverse and often conflicting expressions of the religious life and thought of ancient Israel. The

works' cultural and historical setting in the ancient Near East; the interpretive history of selected passages influential in Western culture. Introduction to a wide range of critical and literary approaches to biblical studies. Students view course lectures, which survey the entire Bible, on line; class time focuses on specific biblical passages and their subsequent interpretation in Jewish and Christian culture. HU

**RLST 148a / ER&M 219a / HIST 219a / JDST 200a / MMES 149a, History of the Jews and Their Diasporas to Early Modern Times** Ivan Marcus

A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire. Focus on the formative period of classical rabbinic Judaism and on the symbiotic relationships among Jews, Christians, and Muslims. Jewish society and culture in its biblical, rabbinic, and medieval settings. Counts toward either European or non-Western distributional credit within the History major, upon application to the director of undergraduate studies. HU RP

**RLST 156b, Sex in the Bible** Dale Martin

A survey of the Bible from Genesis through Revelation, with a focus on depictions of sexuality, sexual behavior, gender, and household. Issues of culture, ethics, and ideology in the construction of sexuality and gender. HU

**RLST 160a / HIST 280a / HUMS 348a, The Catholic Intellectual Tradition**

Carlos Eire

Introductory survey of the interaction between Catholicism and Western culture from the first century to the present, with a focus on pivotal moments and crucial developments that defined both traditions. Key beliefs, rites, and customs of the Roman Catholic Church, and the ways in which they have found expression; interaction between Catholics and the institution of the Church; Catholicism in its cultural and sociopolitical matrices. Close reading of primary sources. HU

\* **RLST 163b, Religion and the Enlightenment** Noreen Khawaja

An introduction to the major intellectual issues of Christianity around the time of the Enlightenment. Emphasis on the religious and philosophical confrontation with radical doubt and on the meaning of religious truth. Readings from Descartes, Hume, Kant, Voltaire, Reimarus, Lessing, Vico, Hegel, and Feuerbach. HU

## Topics in Religious Studies (Group C)

\* **RLST 166a, Classical Arabic Philosophy** Frank Griffel

Close reading of primary texts from the Arabic philosophical tradition c. 750–1300, with attention to the major arguments and underlying assumptions of each author. The translation movement via al-Farabi, Ibn Sina (Avicenna), al-Ghazali, Maimonides, and others; the philosophical textbooks of Muslim madrasa education. HU

\* **RLST 182b, Buddhist Traditions of Mind and Meditation** Andrew Quintman

Buddhist meditation practices examined in the context of traditional theories of mind, perception, and cognition. Readings both from Buddhist canonical works and from secondary scholarship on cognitive science and ritual practice. Recommended preparation: a course in Asian religions. HU

\* **RLST 184a / SAST 358a, The Ramayana** Hugh Flick

Exploration of the religious and ideological interpretations of this epic of ancient India as manifested in performance and in written texts. Emphasis on the religious and historical contexts from which the texts emerged. All readings in translation. HU TR

**RLST 193a / JDST 332a / MMES 197a, Zionism** Eliyahu Stern

Introduction to the core ideas of the Zionist movement from the mid-nineteenth century to the mid-twentieth. Focus on internal Jewish debates and criticism of the movement by European and Middle Eastern intellectuals. Social, political, cultural, and messianic ideological strands within the movement and their interpretations of various historical experiences and ideas located in the Jewish tradition. HU

\* **RLST 199b / MMES 293b, Sufism and Ethics in the Works of al-Ghazali** Staff

Close reading of selections from al-Ghazali's writings on Sufism, the mystical tradition in Islam, with a focus on his *Revival of the Religious Sciences*. Ways in which Sufism can be lived in the daily lives of Muslims; its relations with philosophy and theology; the role of Sufism in creating a Muslim ethic. HU

\* **RLST 201a / HIST 232Ja / HUMS 443a / JDST 270a / MMES 342a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

**RLST 202b / HIST 345b / JDST 265b / MMES 148b, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries** Ivan Marcus

Jewish culture and society in Muslim lands from the Prophet Muhammad to Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU RP

\* **RLST 210a / PHIL 206a, Nietzsche, Religion, and Modernity** Nancy Levene

Exploration of Nietzsche's ideas on religion and of how his work is understood in a broader history inclusive of the present. Selections from several major works read in the context of shorter passages from Jewish and Christian scripture and from works by Immanuel Kant, with whom Nietzsche saw himself in dialogue. Questions of religion, modernity, and the nature of history expressive of both. HU

**RLST 214b / HIST 248b / JDST 293b, Introduction to Modern Jewish Thought**  
Eliyahu Stern

An overview of Jewish philosophical trends, movements, and thinkers from the seventeenth century to the twenty-first. Topics include enlightenment, historicism, socialism, secularism, religious radicalism, and Zionism. HU

**\* RLST 227b / HIST 258Jb / JDST 278b, Jewish Citizenship in Modern Europe**

Eliyahu Stern

Seventeenth- to twentieth-century responses to Jewish citizenship in modern European states. Religious law; modern Jewish identity; Zionism; Judaism as a religion vs. a nation; the place of minorities in contemporary Europe. WR, HU

**\* RLST 240a, The Historical Jesus** Dale Martin

Introduction to the study of Jesus in canonical and noncanonical sources. History of the quest for the historical Jesus, methods for reconstructing a historical account of Jesus, and versions of Jesus as offered by the early Gospels. No background in New Testament assumed. WR, HU

**\* RLST 246a / CLCV 436a, Theories of Authorship and Canon**

Hindy Najman and Irene Peirano

The relationship between authorship and canon formation in ancient and modern theory. Authorial practices of Greco-Roman, Jewish, and Christian communities in antiquity compared with modern theories of authorship and attribution. The creation of literary traditions; the changing role of the author; the effects of reading practices on literary survival. HU

**\* RLST 260b, Religion, War, and America** Harry Stout

The relationship between religion and war in American history from colonial beginnings through Vietnam. The religious meanings of Americans at war; the mutually reinforcing influences of nationalism and religion; war as the norm of American national life; the concept of civil religion; biblical and messianic contexts of key U.S. conflicts. HU

**RLST 268a / HIST 281a, Christian Mysticism, 1200–1700** Staff

An introductory survey of the mystical literature of the Christian West, focusing on the late medieval and early modern periods. Close reading of primary texts, analyzed in their historical context. HU

**RLST 273a / PHIL 334a / PLSC 281a, Ethical and Social Issues in Bioethics**

Stephen Latham

A selective survey of issues in biomedical ethics. Comparison of different points of view about biomedical issues, including religious vs. secular and liberal vs. conservative. Special attention to issues in research and at the beginning and end of life. SO

**\* RLST 274a, Personal Identity in Western Thought** Noreen Khawaja

The pursuit of the authentic self by Western authors and artists of different cultures and historical periods. Personal identity as something defined and sustained through repeated social performance; ways in which interpretations of such performance affect modern ideas about truth, trust, sincerity, and identity. Readings in philosophy, literature, and religious thought from antiquity to the present. HU

**RLST 290a / MMES 290a / PLSC 435a, Islam Today: Jihad and Fundamentalism**

Frank Griffel

Introduction to modern Islam, including some historical background. Case studies of important countries in the contemporary Muslim world, such as Egypt, Iran, Pakistan, and Saudi Arabia. Islam as a reactive force to Western colonialism; the ideals of Shari'a and jihad; violence and self-sacrifice; and Islam as a political ideology. HU



\* **RLST 291a / EP&E 273a / MMES 343a / SOCY 343a, Sociology of Islam**

Jonathan Wyrzten

Social scientific studies of Islam; introduction to sociology of religion and its application to Islam; the utility of "Islam" and "Muslim" as analytical categories; debates about definitions of Islam and religion in anthropology and religious studies; comparative sociological studies both within Islam and contrasting Islam with other religions. SO

\* **RLST 301a / ANTH 384a / HSAR 386a, Art and Ritual in Tribal India** Staff

Introduction to aesthetic practices performed in a ritual context by tribal groups in India. Focus on ways in which paintings, sculptures, songs, and dances function as mediums through which the divine is materialized. The influence of patrimonialization and commoditization on the production and meaning of ritual objects and images. HU

\* **RLST 304a, Religion and Political Power in the Western Tradition** Devin Singh

The relationship between religion and politics in Western thought, institutions, and communities, with a focus on the Christian tradition. Church-state relations in various historical moments; the development of secular political thought. Ways in which religious and political spheres have been and remain connected and mutually dependent. HU

\* **RLST 311b / AMST 392b, Religion and Popular Culture** Kathryn Lofton

Study of the religious dimensions of popular culture. Religious institutions' engagement in economic markets; the deployment of religious imagery in the cultural marketplace; consumer culture as a religious space. HU

\* **RLST 335b / HUMS 210b / ITAL 317b / LITR 180b / WGSS 317b, Women in the Middle Ages** Christiana Purdy Moudarres

Medieval understandings of womanhood examined through analysis of writings by and/or about women, from antiquity through the Middle Ages. Introduction to the premodern Western canon and assessment of the role that women played in its construction. TR

## Advanced Topics in Religious Studies (Group D)

\* **RLST 400a, The Dead Sea Scrolls and the History of Ancient Judaism: The Damascus Document** Steven Fraade

Study of the Damascus Document, one of the most important of the Dead Sea Scrolls. Attention to the document's place in the history of biblical interpretation and ancient Jewish law; the nature and rhetorical function of its textual practices, both narrative and legal; and its relation to the central sectarian writings of the Qumran community. reading proficiency in ancient Hebrew L5, HU

**RLST 402b / PHIL 326b, The Philosophy of Religion** John Hare

The relation between religion and ethics, traditional arguments for the existence of God, religious experience, the problem of evil, miracles, immortality, science and religion, and faith and reason. HU

\* **RLST 405a / JDST 392a, Mishnah Seminar: Tractate Rosh HaShanah**

Steven Fraade

Close study of a tractate of the Mishnah, the earliest digest of rabbinic law, and its accompanying Tosefta, dealing with rules for the establishment of New Moons, the intercalation of the lunar calendar, the testimony and examination of witnesses, the

festival of the New Year (Rosh HaShanah), and the sounding of the Shofar. Dual attention to the historical significance of the legal and ritual institutions represented and to the cultural significance of the rhetoric of that representation, including the interplay of law and narrative. Prerequisite: reading fluency in ancient Hebrew. L5, HU

**\* RLST 408a / JDST 400a, Midrash Seminar: Exodus 32 and Its Midrashic Development** Christine Hayes

A study of the midrashic career of the Golden Calf story. Examination of the rich and polyphonic tradition of interpretation found in the Bible itself, in ancient translations, and in classical rabbinic sources. Prerequisite: reading proficiency in Hebrew. L5, HU

**\* RLST 422a / EGYPT 147a, Egyptian Monastic Literature in Coptic** Stephen Davis  
Readings in the early Egyptian classics of Christian asceticism in Sahidic Coptic, including the desert Fathers and Shenute. Prerequisite: EGYPT 127 or equivalent. Counts as L4 if taken after EGYPT 137 or equivalent. L3

**\* RLST 423b / EGYPT 137b, Gnostic Texts in Coptic** Harold Attridge  
Reading, translation, and analysis of Gnostic and Valentinian literature from Nag Hammadi, in several dialects of Coptic. Prerequisite: EGYPT 127 or equivalent. Counts as L4 if taken after EGYPT 147 or equivalent. L3

## Other Courses

**\* RLST 490a or b, Approaches to the Study of Religion** Noreen Khawaja  
An introduction to the academic study of religion, with a focus on foundational concepts and urgent questions. Ways in which major debates in the field have shaped how people think about religion today. Readings in philosophy, sociology, history, and anthropology. Required for all junior majors; open to others with permission of the instructor.

**\* RLST 491a and RLST 492b, The Senior Essay** Kathryn Lofton  
Students writing their senior essays meet periodically in the fall and weekly in the spring for a colloquium directed by the director of undergraduate studies. The essay, written under the supervision of a member of the department, should be a substantial paper between 12,500 and 15,000 words.

## Russian and East European Studies

Director of undergraduate studies: Marijeta Bozovic, 2708 HGS, 432-3904, marijeta.bozovic@yale.edu

### FACULTY ASSOCIATED WITH THE MAJOR

**Professors** Vladimir Alexandrov (*Slavic Languages & Literatures*), Paul Bushkovitch (*History*), Katerina Clark (*Comparative Literature, Slavic Languages & Literatures*), Laura Engelstein (*History*), John Gaddis (*History*), Harvey Goldblatt (*Slavic Languages & Literatures*), John MacKay (*Slavic Languages & Literatures, Film Studies*), Timothy Snyder (*History*)

**Associate Professors** Jason Lyall (*Political Science*), Douglas Rogers (*Anthropology*), Marci Shore (*History*)

**Assistant Professors** Marijeta Bozovic (*Slavic Languages & Literatures*), Molly Brunson (*Slavic Languages & Literatures*), Bella Grigoryan (*Slavic Languages & Literatures*)

**Lecturer** Hilary Fink

**Senior Lectors II** Irina Dolgova, Constantine Muravnik

**Senior Lectors** Krystyna Illakowicz, Julia Titus, Karen von Kunes

The major in Russian and East European Studies, administered by the Department of Slavic Languages and Literatures, offers an interdisciplinary approach to the study of a broad region: Russia, Ukraine, Belarus, the Caucasus, and Central Asia; Poland, Hungary, the Czech and Slovak Republics, and other areas in east central Europe; and the Balkans. The program is appropriate for students considering careers in international public policy, diplomacy, or business, and is also suited to students wishing to continue academic work.

**Languages** A full understanding of the area demands a knowledge of its languages. Students must demonstrate either proficiency in Russian or intermediate-level ability in an East European language. Students may demonstrate proficiency in Russian by (1) completing fourth-year Russian (RUSS 160, 161); (2) passing a written examination to demonstrate equivalent ability; or (3) completing a literature course taught in Russian and approved by the director of undergraduate studies. Students may demonstrate intermediate-level ability in an East European language by (1) completing a two-year sequence in an East European language (currently Czech or Polish; students interested in studying other East European languages should contact the director of undergraduate studies); or (2) by passing a language examination demonstrating equivalent ability. Students are encouraged to learn more than one language.

**Course requirements** Thirteen term courses taken for a letter grade are required for the major. Students must take one course in Russian or East European history selected in consultation with the director of undergraduate studies. If Russian is presented as the primary language to satisfy the requirements of the major, then all East European language courses and third- and fourth-year Russian courses count toward the major. If an East European language other than Russian is presented as the primary language, then all courses in that language designated L3 or higher count toward the major. Electives are chosen in consultation with the director of undergraduate studies from an annual list of offerings. Electives must include at least one course in a social science. Other undergraduate courses relevant to Russian and East European Studies, including residential college seminars, may also count toward the major if approved by the director of undergraduate studies. Qualified students may elect pertinent courses in the Graduate School with the permission of the instructor, the director of graduate studies, and the director of undergraduate studies.

**Senior requirement** Every major must write a senior essay in RSEE 490, 491. At the beginning of the senior year, students enroll in RSEE 490 and arrange for a faculty member to serve as senior adviser. By the third Friday of October, majors submit a detailed prospectus of the essay, with bibliography, to the adviser. A draft of at least ten pages of the text of the essay, or a detailed outline of the entire essay, is due to the adviser by the last day of reading period. The student provides the adviser with a form that the adviser signs to notify the director of undergraduate studies that the first-term

requirements for the senior essay have been met. Failure to meet these requirements results in loss of credit for RSEE 490. The senior essay takes the form of a substantial article, no longer than 13,000 words, excluding footnotes and bibliography. Three copies of the essay are due in the Slavic departmental office by April 10, 2015. A member of the faculty other than the adviser grades the essay.

**Study and travel** Students should be aware of opportunities for study and travel in Russia and eastern Europe. The director of undergraduate studies can provide information on these programs and facilitate enrollment. Students who spend all or part of the academic year in the region participating in established academic programs usually receive Yale College credit, and are strongly encouraged to take advantage of study abroad opportunities during summers or through the Year or Term Abroad program. Students wishing to travel abroad as part of the major should consult the director of undergraduate studies by October 1.

**M.A. program** The European and Russian Studies program does not offer the simultaneous award of the B.A. and M.A. degrees. However, students in Yale College are eligible to complete the M.A. in European and Russian Studies (with concentration in Russia and eastern Europe) in one year of graduate work. Students interested in this option must complete eight graduate courses in the area by the time they complete the bachelor's degree. Only two courses may be counted toward both the graduate degree and the undergraduate major. Successful completion of graduate courses while still an undergraduate does not guarantee admission into the M.A. program. Students must submit the standard application for admission to the M.A. program.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite or corequisite** Demonstrated proficiency in Russian or intermediate-level ability in an East European lang

**Number of courses** 13 term courses (incl senior essay and specified lang courses)

**Distribution of courses** 1 course in Russian or East European hist approved by DUS; at least 1 course in social sciences

**Senior requirement** Senior essay (RSEE 490, 491)

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\* **RSEE 008b / CLCV 008b / HUMS 074b / LITR 091b / MGRK 001b, Western Visions of Greece** George Syrimis

Literary, philosophical, political, and aesthetic categories used by Western cultures since the Enlightenment to construct the concepts "Hellenic" and "ancient Greece." The refiguring of ancient Greek civilization as an ideal cultural template, symbolic origin, and philosophical reflection for both European philhellenes and contemporary Greeks. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

**RSEE 254b / RUSS 254b, Novels of Tolstoy and Dostoevsky** Vladimir Alexandrov  
Close reading of major novels by two of Russia's greatest authors. Focus on the interrelations of theme, form, and literary-cultural context. Readings and discussion in English. HU

**\* RSEE 300b / CZEC 301b / LITR 220b, Milan Kundera: The Czech Novelist and French Thinker** Karen von Kunes

Close reading of Kundera's novels, with analysis of his aesthetics and artistic development. Relationships to French, German, and Spanish literatures and to history, philosophy, music, and art. Topics include paradoxes of public and private life, the irrational in erotic behavior, the duality of body and soul, the interplay of imagination and reality, the function of literary metaphor, and the art of composition. Readings and discussion in English. HU TR

**RSEE 390b / HIST 237b / HUMS 285b / RUSS 241b, Russian Culture: The Modern Age** Paul Bushkovitch and John MacKay

An interdisciplinary exploration of Russian cultural history, focusing on literature, art, religion, social and political thought, and film. Conceptions of Russian nationhood; the myths of St. Petersburg; dissent and persecution; the role of social and cultural elites; the intelligentsia; attitudes toward the common people; conflicting appeals of rationality, spirituality, and idealism; the politicization of personal life; the impact of the Bolshevik Revolution and its aftermath. HU

**\* RSEE 490a and RSEE 491b, The Senior Essay** Marijeta Bozovic

Preparation of the senior essay under faculty supervision. The essay grade becomes the grade for both terms of the course. Required of all seniors majoring in Russian and East European Studies. Credit for RSEE 490 only on completion of RSEE 491.

## Related Courses That Count toward the Major

Students are encouraged to examine the offerings in Slavic Languages and Literatures and other departments, as well as residential college seminars, for additional related courses that may count toward the major.

**\* ANTH 438b, Culture, Power, Oil** Douglas Rogers

The production, circulation, and consumption of petroleum as they relate to globalization, empire, cultural performance, natural resource extraction, and the nature of the state. Case studies include the United States, Saudi Arabia, Nigeria, Venezuela, and the former Soviet Union. SO  
Anthropology: Sociocultural

**HIST 261a / PLSC 176a, The Cold War** John Gaddis

The Cold War from beginning to end, viewed from the perspective of all its major participants, with emphasis on recently released Soviet, East European, and Chinese sources. Counts toward either European or U.S. distributional credit within the History major, upon application to the director of undergraduate studies. HU, SO

**HIST 263a, Eastern Europe to 1914** Timothy Snyder

Eastern Europe from the medieval state to the rise of modern nationalism. The Ottoman Empire, the Polish-Lithuanian Commonwealth, the Hapsburg monarchy, and various native currents. Themes include religious diversity, the constitution of empire, and the emergence of secular political ideologies. HU

**HIST 264b, Eastern Europe since 1914** Timothy Snyder

Eastern Europe from the collapse of the old imperial order to the enlargement of the European Union. Main themes include world war, nationalism, fascism, and communism. Special attention to the structural weaknesses of interwar nation-states and postwar communist regimes. Nazi and Soviet occupation as an age of extremes.

The collapse of communism. Communism after 1989 and the dissolution of Yugoslavia in the 1990s as parallel European trajectories. HU

\* **HIST 270Ja, Philosophy of History in Central Europe** Marci Shore

Ways in which central European philosophers before, during, and after the communist period grappled with the meaning of history, the role of the individual within history, and the space for ethics within historical determinism. Philosophy of history as an aspect of, and response to, the totalitarian experiments of the twentieth century. WR, HU

\* **HIST 271Ja, Communism in Eastern Europe** Timothy Snyder and Sara Silverstein

The origins and evolution of communism in eastern Europe after World War II explored from political, cultural, social, and intellectual perspectives. Methods of establishing authoritarian government; the effects of such government on different social groups; the dynamics of national versus Soviet communism; the legacy of interwar nation-states and wartime occupation by Nazi and Soviet regimes. WR, HU

\* **HIST 274Jb, Stalin and the Soviet Union, 1920–1939** Staff

The Soviet Union under Joseph Stalin, including the violent collectivization of agriculture, rapid industrialization, the Great Terror, and the introduction of mass education and literacy. The creation of the Stalinist state and the so-called revolution from above; how people lived and understood the Soviet experience; achievements sought by the Soviet experiment; the relationship between Leninism and Stalinism. WR, HU

## Science

Yale College offers two yearlong interdepartmental course sequences for freshmen with strong preparation in the sciences. SCIE 030 and 031, Current Topics in Science, is a freshman seminar designed for incoming students who have strong preparation in mathematics and science but who do not intend to major in the sciences. SCIE 198 and 199, Perspectives on Science and Engineering, is a lecture and discussion course that supplements the standard academic program of a selected group of freshmen who have unusually strong preparation in mathematics and science. It presents a broader range of topics than standard science courses and highlights the interdependence of the scientific disciplines.

Students may apply to either SCIE 030 and 031 or SCIE 198 and 199 during the summer before their freshman year. Application information is available on the Freshman Seminar Web site (<http://yalecollege.yale.edu/content/freshman-seminar-program-2>) (SCIE 030, 031) and on the Freshman Web site (<http://yalecollege.yale.edu/content/perspectives-science-and-engineering-pse>) (SCIE 198, 199).

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## Courses

\* **SCIE 030a and SCIE 031b, Current Topics in Science** Douglas Kankel

A series of modules in lecture and discussion format addressing scientific issues arising in current affairs. Topics are selected for their scientific interest and contemporary relevance, and may include global warming, human cloning, and the existence of

extrasolar planets. Credit for SCIE 030 only on completion of SCIE 031; one course credit is awarded for successful completion of the year's work. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SC ½ Course cr per term

**\* SCIE 198a and SCIE 199b, Perspectives on Science and Engineering**

William Segraves and Staff

A series of lectures—one every other week—by science and engineering faculty guest lecturers. In alternate weeks, groups of students and faculty participants meet to discuss the lecture topics more fully. Students are expected to be enrolled in other science courses, usually with laboratory. Credit for SCIE 198 only on completion of SCIE 199; one course credit is awarded for successful completion of the year's work. Enrollment limited to freshmen. ½ Course cr per term

## Slavic Languages and Literatures

Director of undergraduate studies: Marijeta Bozovic, 2708 HGS, 432-3904, marijeta.bozovic@yale.edu; language coordinator: Irina Dolgova, 2704A HGS, 432-1307, irina.dolgova@yale.edu; slavic.yale.edu

### FACULTY OF THE DEPARTMENT OF SLAVIC LANGUAGES AND LITERATURES

**Professors** Vladimir Alexandrov, Katerina Clark, Harvey Goldblatt, John MacKay

**Assistant Professors** Marijeta Bozovic, Molly Brunson, Bella Grigoryan

**Lecturer** Hilary Fink

**Senior Lectors II** Irina Dolgova, Constantine Muravnik

**Senior Lectors** Krystyna Illakowicz, Julia Titus, Karen von Kunes

The major in Russian offered by the Department of Slavic Languages and Literatures acquaints students with Russian literature and culture, develops students' appreciation of literary values and skill in literary analysis, and gives them a basic competence in Russian. For an area major in Russian studies, see Russian and East European Studies, an interdisciplinary program administered by the Department of Slavic Languages and Literatures.

Students majoring in Russian may concentrate exclusively on Russian language and literature (Program I), or they may elect to study Russian literature in the context of comparative studies of literature (Program II). For Program II, credit is given for work done in other departments. Specific courses in each program must be arranged with the director of undergraduate studies. Students interested in specializing in Russian or Slavic linguistics may arrange a special concentration in linguistics with the director of undergraduate studies.

**The major** Prerequisite to the major in both programs is RUSS 151. The department offers two sequences of language courses to fulfill the prerequisite: either (1) RUSS 110, 120, 130, 140, 150, and 151 or (2) RUSS 125, 145, 150, and 151. Prospective majors should complete RUSS 140 or 145 by the end of their sophomore year or accelerate their course of study by taking summer courses or studying abroad. While completing the prerequisite, students are encouraged to begin fulfilling requirements of the major that

do not presuppose advanced knowledge of Russian by taking courses in Russian history and Russian literature in translation.

In addition to the prerequisite, the major in Russian requires at least eleven term courses, which must include the following (some courses may fulfill more than one requirement):

1. Two terms of Russian literature in translation: RUSS 250 and 253.
2. Fourth-year Russian: RUSS 160 and 161.
3. Two terms of Russian literature read and discussed in the original language, typically selected from Group A courses numbered 170 or above.
4. At least two term courses in Russian literature of the nineteenth century and two in Russian literature of the twentieth century. Students should select courses from Group A and from the 250 series with this requirement in mind.
5. RUSS 490. The senior essay is the intellectual culmination of the student's work in the major. All primary sources used in the essay must be read in Russian.

In addition to the requirements above, each program requires the following:

**Program I** One term course in the history or culture of Russia, selected in consultation with the director of undergraduate studies; three additional term courses in the Department of Slavic Languages and Literatures above RUSS 151. These may include literature courses taught either in translation or in the original, advanced language training courses, or graduate courses.

**Program II** Four term courses outside the Department of Slavic Languages and Literatures that are relevant to the major in the context of comparative studies of literature, selected in consultation with the director of undergraduate studies.

**Senior requirement** All majors write a senior essay (RUSS 490), an independent project carried out under the guidance of a faculty member. Three copies of the essay are due in the Slavic departmental office on April 10, 2015.

**Placement examination** A departmental placement examination will be given before the first day of classes in the fall term; see the Center for Language Study Web site (<http://cls.yale.edu/placement-testing>) for the time and location. Students who have studied Russian elsewhere must take the placement examination before enrolling in any Russian language course at Yale. For further information consult Irina Dolgova, language coordinator, 432-1307.

**Graduate courses** Courses in the Graduate School are open to qualified undergraduates with permission of the instructor and of the director of graduate studies. Course descriptions are available at the office of the director of undergraduate studies.

**Study abroad** Students majoring in Russian are strongly encouraged to spend a summer or a term studying in the Russian Federation under the auspices of programs approved by the director of undergraduate studies. Language courses taken during the summer or during a term in Russia in approved programs may substitute for certain advanced Russian courses at Yale. Students interested in study abroad should consult the director of undergraduate studies well before their junior year.



## REQUIREMENTS OF THE MAJOR

**Prerequisite** RUSS 151**Number of courses** 11 term courses beyond prereq (incl senior essay)**Specific courses required** *Both programs*—RUSS 160, 161, 250, 253**Distribution of courses** *Both programs*—2 terms of 19th-century Russian lit; 2 terms of 20th-century Russian lit; 2 courses from Group A numbered 170 or above; *Program I*—1 course in hist or culture of Russia; 3 addtl courses in dept of Slavic Langs and Lits above level of RUSS 151; *Program II*—4 courses relevant to major in other depts, with DUS approval**Senior requirement** Senior essay (RUSS 490)

## Czech, Polish, Romanian, and Ukrainian

**CZEC 110a, Elementary Czech I** Karen von KunesA comprehensive introduction to Czech for students with no previous knowledge of the language. Essentials of grammar, with emphasis on oral proficiency, reading, writing, and listening comprehension. Newspaper articles, annotated excerpts from Capek's *R.U.R.*, Hasek's *Svejk*, Kundera's *Joke* and *Unbearable Lightness of Being*, and Havel's *Private View*. Audio- and videotapes. Credit only on completion of CZEC 120. L1 RP 1½ Course cr**CZEC 120b, Elementary Czech II** Karen von Kunes

Continuation of CZEC 110. After CZEC 110 or equivalent. L2 RP 1½ Course cr

**CZEC 130a, Intermediate Czech** Karen von Kunes

Continuation of CZEC 120. Grammar and usage, with emphasis on idiomatic expressions, syntax, and stylistics. Readings in modern Czech history, prose, and poetry; discussion of economic, political, and social issues. After CZEC 120 or equivalent. L3 RP 1½ Course cr

**CZEC 140b, Advanced Czech** Karen von Kunes

Continuation of CZEC 130. Emphasis on writing skills and spoken literary Czech. After CZEC 130 or equivalent. L4 RP 1½ Course cr

**PLSH 110a, Elementary Polish I** Krystyna Illakowicz

A comprehensive introduction to elementary Polish grammar and conversation, with emphasis on spontaneous oral expression. Reading of original texts, including poetry. Use of video materials. Credit only on completion of PLSH 120. L1 RP 1½ Course cr

**PLSH 120b, Elementary Polish II** Krystyna Illakowicz

Continuation of PLSH 110. After PLSH 110 or equivalent. L2 RP 1½ Course cr

**PLSH 130a, Intermediate Polish I** Krystyna Illakowicz

A reading and conversation course conducted in Polish. Systematic review of grammar; practice in speaking and composition; reading of selected texts, including poetry. Use of video materials. After PLSH 120 or equivalent. L3 RP 1½ Course cr

**PLSH 140b, Intermediate Polish II** Krystyna Illakowicz

Continuation of PLSH 130. After PLSH 130 or equivalent. L4 RP 1½ Course cr

**\* ROMN 110a, Elementary Romanian I** Staff

The first half of a two-term introduction to Romanian language, grammar, and cultural literacy centered around the theme of life in Bucharest. Topics, vocabulary,

and grammar lessons based on everyday linguistic interactions in the city. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. Credit only on completion of ROMN 120. L1

**\* ROMN 120b, Elementary Romanian II** Staff

The second half of a two-term introduction to Romanian language, grammar, and cultural literacy centered around the theme of life in Bucharest. Topics, vocabulary, and grammar lessons based on everyday linguistic interactions in the city. Prerequisite: ROMN 110. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L2

**\* ROMN 130a, Intermediate Romanian I** Staff

Continuation of ROMN 120, with attention to all four language skills and to cultural literacy. Students reach B2 level in compliance with the Common European Framework of Reference for Languages (CEFRL). Prerequisite: ROMN 120 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L3

**\* ROMN 140b, Intermediate Romanian II** Staff

Continuation of ROMN 130, with attention to all four language skills and to cultural literacy. Students reach C1 level in compliance with the Common European Framework of Reference for Languages (CEFRL). Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L4

**\* UKRN 110a, Elementary Ukrainian I** Staff

The first half of a two-term introduction to Ukrainian for students with no previous knowledge of the language. Emphasis on speaking, reading, listening, and writing skills. Topics, vocabulary, and grammar lessons based on everyday linguistic interactions. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. Credit only on completion of UKRN 120. L1

**\* UKRN 120b, Elementary Ukrainian II** Staff

The second half of a two-term introduction to Ukrainian for students with no previous knowledge of the language. Emphasis on speaking, reading, listening, and writing skills. Topics, vocabulary, and grammar lessons based on everyday linguistic interactions. Prerequisite: UKRN 110. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L1

## Group A

Unless otherwise noted, all Group A courses are conducted in Russian.

**RUSS 110a, First-Year Russian I** Julia Titus

A video-based course designed to develop all four language skills: reading, writing, speaking, and listening comprehension. Use of dialogues, games, and role playing.

In addition to readings in the textbook, students read original short stories and learn Russian songs and poems. Oral and written examinations. Credit only on completion of RUSS 120. L1 RP 1½ Course cr

**RUSS 120b, First-Year Russian II** Julia Titus

Continuation of RUSS 110. After RUSS 110 or equivalent. L2 RP 1½ Course cr

**RUSS 122a, Russian for Bilingual Students I** Julia Titus

A comprehensive Russian course for native speakers of Russian or other Slavic languages whose formal education has been in English. Overview of Russian grammar, focusing on the writing system, cases, conjunction, and syntax. Readings from Russian prose, film screenings, discussion, and regular practice in translation and composition.

L1, L2

**RUSS 125a, Intensive Elementary Russian** Constantine Muravnik

An intensive course that covers in one term the material taught in RUSS 110 and 120. For students of superior linguistic ability. Study of Russian grammar; practice in conversation, reading, and composition. Recommended for prospective majors in Russian and in Russian and East European Studies. L1, L2 RP 2 Course cr

**RUSS 130a, Second-Year Russian I** Irina Dolgova

A course to improve functional competence in all four language skills (speaking, writing, reading, and listening comprehension). Audio activities, for use both in the classroom and independently, are designed to help students improve their listening comprehension skills and pronunciation. Lexical and grammatical materials are thematically based. After RUSS 120 or equivalent. L3 RP 1½ Course cr

**RUSS 140b, Second-Year Russian II** Irina Dolgova

Continuation of RUSS 130. After RUSS 130 or equivalent. L4 RP 1½ Course cr

\* **RUSS 142b, Russian for Bilingual Students II** Julia Titus

Continuation of RUSS 122. Further development of reading and writing skills. Expansion of vocabulary. After RUSS 122 or equivalent. L3, L4

**RUSS 145b, Intensive Intermediate Russian** Constantine Muravnik

A continuation of RUSS 125 that covers in one term the material taught in RUSS 130 and 140. For students of superior linguistic ability. Prerequisite: RUSS 125. L3, L4 RP 2 Course cr

**RUSS 150a, Third-Year Russian I** Constantine Muravnik

Intensive practice in conversation and composition accompanied by review and refinement of grammar. Readings from nineteenth- and twentieth-century literature, selected readings in Russian history and current events, and videotapes and films are used as the basis of structured conversation, composition, and grammatical exercises. Oral and written examinations. Audiovisual work in the Center for Language Study required. After RUSS 140 or 145 or equivalent. L5 RP 1½ Course cr

**RUSS 151b, Third-Year Russian II** Constantine Muravnik

Continuation of RUSS 150. After RUSS 150 or equivalent. L5 RP 1½ Course cr

\* **RUSS 155a, The Language of the Russian Revolution** Constantine Muravnik

The political and social landscape of the 1917 Russian Revolution explored through the shifting ambiguities of political slogans. Readings from the memoirs of the revolution's

main figures represent the entire political spectrum from right to left. Prerequisite: RUSS 140 or equivalent. L5 RP

**RUSS 160a, Fourth-Year Russian I** Irina Dolgova

Discussion topics include Russian culture, literature, and self-identity; the old and new capitals of Russia, the cultural impact of the Russian Orthodox Church, and Russia at war. Readings from mass media, textbooks, and classic and modern literature. Use of video materials. After RUSS 151 or equivalent. L5

**RUSS 161b, Fourth-Year Russian II** Irina Dolgova

Continuation of RUSS 160. After RUSS 160 or equivalent. L5

**\* RUSS 184b, Advanced Russian Conversation through Contemporary Media**

Irina Dolgova

Development of oral and written skills necessary for engaging in sophisticated discourse on current events. Attention to sociopolitical, economic, and cultural realities of modern Russia and the Russian-speaking world. Topics include the law, religion, healthcare, military and educational systems and policies, and cultural and social events. Materials drawn from contemporary newspapers, radio, television, and blogs. Prerequisite: RUSS 142 or 151. L5

## Group B

The courses in this group, conducted in English, are open to all Yale College students.

**\* CZEC 301b / LITR 220b / RSEE 300b, Milan Kundera: The Czech Novelist and French Thinker** Karen von Kunes

Close reading of Kundera's novels, with analysis of his aesthetics and artistic development. Relationships to French, German, and Spanish literatures and to history, philosophy, music, and art. Topics include paradoxes of public and private life, the irrational in erotic behavior, the duality of body and soul, the interplay of imagination and reality, the function of literary metaphor, and the art of composition. Readings and discussion in English. HU TR

**\* PLSH 246b / FILM 241b, Polish Communism and Postcommunism in Film**  
Krystyna Illakowicz

The Polish film school of the 1950s and the Polish New Wave of the 1960s. Pressures of politics, ideology, and censorship on cinema. Topics include gender roles in historical and contemporary narratives, identity, ethos of struggle, ethical dilemmas, and issues of power, status, and idealism. Films by Wajda, Munk, Polanski, Skolimowski, Kieslowski, Holland, and Kedzierzawska, as well as selected documentaries. Readings by Milosz, Andrzejewski, Mickiewicz, Maslowska, Haltoff, and others. Readings and discussion in English. HU

**\* PLSH 447b / ART 387b / THST 447b, Objects in Performance**

Dominika Laster and Nathan Roberts

Examination of the meanings and functions of material objects in performance and of the performer-object relation, with attention to historical, theoretical, and practical perspectives. Focus on the work of Tadeusz Kantor, the Polish painter, assemblage artist, set designer, and theater director. Development of a devised theatrical work that culminates in a public performance. Admission by interview or audition. HU

**RUSS 220b / HSAR 221b / HUMS 220b, Russian and Soviet Art, 1757 to the Present**

Molly Brunson

The history of Russian and Soviet art from the foundation of the Academy of the Arts in 1757 to the present. Nineteenth-century academicism, romanticism, and realism; the Russian avant-garde and early Soviet experimentation; socialist realism and late- and post-Soviet culture. Readings and discussion in English. HU TR

**RUSS 241b / HIST 237b / HUMS 285b / RSEE 390b, Russian Culture: The Modern**

Age Paul Bushkovitch and John MacKay

An interdisciplinary exploration of Russian cultural history, focusing on literature, art, religion, social and political thought, and film. Conceptions of Russian nationhood; the myths of St. Petersburg; dissent and persecution; the role of social and cultural elites; the intelligentsia; attitudes toward the common people; conflicting appeals of rationality, spirituality, and idealism; the politicization of personal life; the impact of the Bolshevik Revolution and its aftermath. HU

**\* RUSS 250a / HUMS 276a, Masterpieces of Russian Literature I** Molly Brunson

Introduction to major texts of the nineteenth-century Russian literary tradition. Works by Pushkin, Gogol, Lermontov, Turgenev, Dostoevsky, Tolstoy, and Chekhov examined in their social and historical contexts. Emphasis on the authors' use of genre, language, and literary devices to explore pressing questions posed by Russian modernity. Readings and discussion in English. HU TR

**RUSS 254b / RSEE 254b, Novels of Tolstoy and Dostoevsky** Vladimir Alexandrov

Close reading of major novels by two of Russia's greatest authors. Focus on the interrelations of theme, form, and literary-cultural context. Readings and discussion in English. HU

**RUSS 260a / HUMS 228a / LITR 202a, Nabokov and World Literature**

Marijeta Bozovic

Vladimir Nabokov's writings explored in the context of his life story and of the structures and institutions of literary life in Russian émigré circles. Themes of exile, memory, and nostalgia; hybrid cultural identities and cosmopolitan elites; language and bilingualism; the aims and aesthetics of émigré and diasporic modernism in novels and other media. Additional readings from works of world literature inspired and influenced by Nabokov. Readings and discussion in English. WR, HU

**\* RUSS 307b, Introduction to Medieval and Premodern Russian Civilization**

Harvey Goldblatt

Russian literary culture from the medieval period through the eighteenth century. The development of various literary types and writing techniques; diverse historiographic approaches and methodological perspectives; traditional and innovative theories of literary expression; connections between writing activity and ideological trends. Prerequisite: reading knowledge of Russian. HU RP

**\* RUSS 321a / HUMS 212a / LITR 205a, Capitalism and the Nineteenth-Century European Novel** Bella Grigoryan

The cultural significance and literary representations of capitalism in nineteenth-century Europe. Labor and leisure; material culture and consumerism; social and geographic mobility; constitution of the modern self; the public sphere; private life; economics and literary form. Works by Balzac, Gogol, Dickens, Dostoevsky, and Zola

supplemented by selections from theoretical writings. Readings and discussion in English. WR, HU TR

\* **RUSS 326a, Slavery and Serfdom in Russian and American Culture** John MacKay  
Literary and other forms of cultural production associated with U.S. slavery and Russian serfdom. The relations between bondage and national, cultural, and personal identity; the role of bondage in definitions of aesthetic experience in the pre- and postemancipation periods; the relationship between literacy and the literary; literature of protest; and connections between geographical and subjective space within cultures of enslavement. HU TR

\* **RUSS 333a / HUMS 243a / LITR 227a, The Living Dead in Literature**  
Molly Brunson

A study of ghosts, vampires, cyborgs, animated artworks, and other supernatural beings in Slavic, western European, and American literature and culture. The thematic, historical, and epistemological significance of violating the border between life and death in art. Analysis of novels, short stories, folklore, visual arts, and theoretical texts. Readings and discussion in English. HU

\* **RUSS 345a, The Bildungsroman in Russia and the West** Bella Grigoryan  
History and evolution of the bildungsroman in the European and Russian literary traditions of the late-eighteenth and nineteenth centuries. The genre's relative centrality in European literature and culture; its particular, and sometimes problematic, iterations in the Russian literary and sociocultural context. Some attention to scholarly trends in the study of the bildungsroman. Readings and discussion in English; texts available in the original languages. HU

**RUSS 380b / HUMS 204b / LITR 301b, Putin's Russia and Protest Culture**  
Marijeta Bozovic

Survey of Russian literature and culture since the fall of communism. The chaos of the 1990s; the solidification of power in Putin's Russia; the recent rise of protest culture. Sources include literature, film, and performances by art collectives. Readings and discussion in English; texts available in Russian. WR, HU

\* **SLAV 202a, Old Church Slavic** Harvey Goldblatt

A study of Old Church Slavic and its place in the history of Church Slavic. The main features and the grammar of Old Church Slavic. The Glagolitic and Cyrillic writing systems. Close readings from Old Church Slavic literary monuments. Old Church Slavic in relation to modern Slavic languages (especially Russian). Prerequisite: elementary knowledge of a Slavic language. Conducted in English. RP

\* **SLAV 206b, The Slavic Peoples and Their Languages: From Unity to Diversity**  
Harvey Goldblatt

Examination of the linguistic and cultural history of the Slavs from their prehistoric period up to the formation of the diverse Slavic languages, the individual Slavic states, and their national literatures. *Readings and discussion in English.* Group B courses, conducted in English, are open to all Yale College students and are considered particularly appropriate for students in the Literature major. HU

## Group C

### \* RUSS 480a and RUSS 481b, Directed Reading in Russian Literature

Marijeta Bozovic

Individual study under the supervision of a faculty member selected by the student. Applicants must submit a prospectus approved by the adviser to the director of undergraduate studies by the end of the first week of classes in the term in which the course is taken. The student meets with the adviser at least one hour each week, and takes a final examination or writes a term paper. No credit granted without prior approval of the director of undergraduate studies.

### \* RUSS 490a or b, The Senior Essay Marijeta Bozovic

Research and writing on a topic of the student's own devising. Regular meetings with an adviser as the work progresses from prospectus to final form.

### \* SLAV 485a or b, Directed Reading or Individual Research in Slavic Languages and Literatures Marijeta Bozovic

Individual study under the supervision of a faculty member selected by the student. Applicants must submit a prospectus approved by the adviser to the director of undergraduate studies by the end of the first week of classes in the term in which the course is taken. The student meets with the adviser at least one hour each week, and takes a final examination or writes a term paper. No credit granted without prior approval of the director of undergraduate studies.

## Sociology

Director of undergraduate studies: Frederick Wherry, 493 College St., 432-3793, frederick.wherry@yale.edu; www.yale.edu/sociology

### FACULTY OF THE DEPARTMENT OF SOCIOLOGY

**Professors** Julia Adams, Jeffrey Alexander, Elijah Anderson, † James Baron, Scott Boorman, Richard Breen, Nicholas Christakis, † Paul Cleary, Deborah Davis, Ron Eyerman, Philip Gorski, † Vicki Schultz, Philip Smith, † Olav Sorensen, Frederick Wherry

**Associate Professor** Andrew Papachristos

**Assistant Professors** Rene Almeling, Emily Erikson, Lloyd Grieger, † Sigrun Kahl, Vida Maralani, Jonathan Wyrzten

**Lecturers** Jasmina Besirevic-Regan, Matthew Mahler

† A joint appointment with primary affiliation in another department or school.

Sociology provides the theoretical and empirical foundation for understanding how societies function and how they change over time. Sociologists are interested in the causes and consequences of processes such as the social construction of groups and identity, the evolution of culture, intersubjective meanings, intergroup relations, and hierarchies and social norms. They conduct research on individual behavior and outcomes such as educational attainment, jobs and careers, religious commitment, and political involvement; interpersonal processes such as intimate relationships, sexuality, social interaction in groups, and social networks; the behaviors of organizations and

institutions; the causes and consequences of group differences and social inequality; and social change at the societal and global level.

The Sociology major provides both a solid foundation for students interested in careers in the social sciences and a strong background for a variety of professions in which knowledge about social processes and how societies work is relevant. Many recent graduates have gone on to law school, medical school, or graduate programs in public health, business, education, urban planning, criminology, or sociology. Others work in finance, consulting, publishing, marketing, city planning, teaching, research, and advocacy.

The Sociology department offers three undergraduate programs leading to the B.A. degree: (1) the standard program focuses on sociological concepts, theories, and methods; (2) a combined program allows students to combine sociology with a concentration in another field; (3) a concentration in markets and society focuses on the cultural frameworks, social ties, and social institutions that give rise to markets and that shape economic behavior. Students interested in the major are encouraged to contact the director of undergraduate studies early in their academic careers to discuss potential options.

**Admission to the major** Students interested in the Sociology major should complete either a freshman seminar or at least one introductory course (numbered 110–149) by the end of the sophomore year. This course may be applied toward the requirements of the major. The director of undergraduate studies can waive the introductory course requirement for students who demonstrate adequate preparation for advanced course work in sociology. All students interested in the Sociology major should meet with the director of undergraduate studies no later than the beginning of the junior year to elect a program of study.

**Division of courses** Courses in Sociology are divided by level, with introductory courses numbered from 110 to 149, courses in sociological theory from 150 to 159, courses in sociological methods from 160 to 169, intermediate courses from 150 to 299, advanced courses in the 300s, and individual study and research courses in the 400s. Freshman seminars are numbered below 100 and count as introductory or intermediate courses. In addition, qualified students may petition to enroll in graduate courses, with permission of the instructor and of the director of graduate studies. A list of graduate courses and descriptions is available from the director of undergraduate studies.

### **Program I. The Standard Program**

The requirements for the standard program are:

1. Thirteen term courses in sociology (including the senior colloquium), of which normally no more than two may be drawn from outside the Sociology department. At least one must be an introductory Sociology course or a substitute approved by the director of undergraduate studies, but no more than two introductory courses may count toward this total. A maximum of two courses taken Credit/D/Fail may count toward the requirements of the major.
2. Two courses in sociological theory and two in sociological methods, normally completed by the end of the junior year. SOCY 151, Foundations of Modern Social Theory, and 152, Topics in Contemporary Social Theory, are the required courses



for theory. SOCY 160, Methods of Inquiry, and one additional Sociology course numbered between 161 and 169 are required for methods. Students planning to study abroad in their junior year are strongly encouraged to begin meeting the theory and methods requirements in their sophomore year. They should also discuss the options for their course of study with the director of undergraduate studies before finalizing their plans.

3. One advanced seminar in Sociology (SOCY 300–399).
4. For students in the intensive major, a two-term senior essay and colloquium, SOCY 493, 494. Students in the nonintensive major take one additional 300-level seminar in Sociology and write a one-term senior essay in SOCY 491.

### **Program II. Sociology with Another Subject**

The combined program allows students to unite the study of sociology with the study of another discipline or substantive area. The requirements are:

1. Thirteen term courses (including the senior colloquium), of which at least nine and no more than ten are selected from Sociology, the remainder being chosen from another department or program. At least one must be an introductory Sociology course or a substitute approved by the director of undergraduate studies, but no more than two introductory courses in any department or program may count toward this total. The courses outside Sociology must constitute a coherent unit alone and form a logical whole when combined with the Sociology courses. A maximum of two courses taken Credit/D/Fail may count toward the requirements of the major.
2. Two courses in sociological theory and two in sociological methods, normally completed by the end of the junior year. SOCY 151, Foundations of Modern Social Theory, and 152, Topics in Contemporary Social Theory, are the required courses for theory. SOCY 160, Methods of Inquiry, and one additional Sociology course numbered between 161 and 169 are required for methods. Students planning to study abroad in their junior year are strongly encouraged to begin meeting the theory and methods requirements in their sophomore year. They should also discuss the options for their course of study with the director of undergraduate studies before finalizing their plans.
3. One advanced seminar in Sociology (SOCY 300–399).
4. A one- or two-term senior essay in which the student integrates sociology and the other subject chosen. Students in the intensive major write a two-term senior essay and attend a yearlong biweekly colloquium (SOCY 493, 494). Students in the nonintensive major take one additional 300-level seminar in Sociology and write a one-term senior essay in SOCY 491.

The combined program allows students to design a program to satisfy their own substantive interests and future career plans. By the beginning of the junior year, participants in the combined program are expected to consult with the director of undergraduate studies in order to obtain approval for their course of study.

### **Program III. Concentration in Markets and Society**

Students in the markets and society concentration gain a broad understanding of markets and their relationship to social networks, religion, the state, and culture.

Students explore the field of economic sociology, develop insights into market logics and economic outcomes, and solidify their basic skills in network analysis. Application is required to the markets and society concentration, using a form downloaded from the Sociology department Web site (<http://sociology.yale.edu>). Requirements for the concentration are:

1. Thirteen term courses in sociology (including the senior colloquium). At least one must be an introductory Sociology course or a substitute approved by the director of undergraduate studies, but no more than two introductory courses in any department or program may count toward this total. Up to four courses may be drawn from outside the Sociology department, with approval from the director of undergraduate studies. A maximum of two courses taken Credit/D/Fail may count toward the requirements of the major.
2. Two courses in sociological methods, one in network analysis (e.g., SOCY 167, Social Networks and Society) and another in statistics (e.g., SOCY 162, Methods in Quantitative Analysis).
3. SOCY 321, Sociology of Markets. A different seminar may fulfill this requirement with approval from the director of undergraduate studies.
4. One other intermediate or advanced course in economic sociology. Suitable courses include SOCY 219, Economic Sociology; SOCY 318, Debates over Capitalism; SOCY 348, Consumption and Chinese Popular Culture; and SOCY 395, Wealth and Poverty in Modern China. An intermediate or advanced course in economic anthropology (e.g., ANTH 346, Anthropological Approaches to Capitalism) or a course in economic history or behavioral economics may fulfill this requirement with approval from the director of undergraduate studies.
5. At least one intermediate or advanced course in microeconomics (e.g., ECON 121 or 125).
6. A one- or two- term senior essay integrating sociology with business, markets, or economic behavior. Students in the intensive major write a two-term senior essay and attend the yearlong biweekly colloquium (SOCY 493, 494). Students in the nonintensive major take one additional 300-level seminar in Sociology and write a one-term senior essay in SOCY 491.

**Senior requirement for the nonintensive major** Students electing the nonintensive major take one additional seminar in Sociology (SOCY 300–399) and write a one-credit senior essay during the senior year (SOCY 491). The senior essay for nonintensive majors is intended to be an in-depth scholarly review and critical analysis based on secondary sources. Students select a controversial topic in any sociological field and write a literature review that evaluates what is known about the topic. All nonintensive majors are required to enroll in SOCY 491 to receive credit for the senior essay. To register for this course, students must submit a written plan of study approved by a faculty adviser to the director of undergraduate studies no later than the end of registration period in the term in which the senior essay is to be written. Nonintensive majors are not eligible to graduate with Distinction in the Major.

**Senior requirement for the intensive major** The intensive major gives students an opportunity to undertake a yearlong program of original research resulting in a contribution to sociological knowledge. The yearlong project requires substantial independent research and knowledge of a sociological subfield. Students use

research methods such as data gathering through participant observation, in-depth interviewing, conducting of small-scale surveys, or secondary analysis of existing data. They may present findings in a variety of forms, from ethnographic narratives to analytical statistics. Students select primary and secondary advisers from the faculty. Students in the intensive major enroll in SOCY 493, 494, Senior Essay and Colloquium for Intensive Majors, during their senior year. The colloquium provides a forum for discussing the research process and for presenting students' research at various stages. Intensive majors are eligible to graduate with Distinction in the Major if they meet the grade standards for Distinction—see under Honors (p. 30) in the Undergraduate Curriculum (p. 17) section—and submit a senior essay written in SOCY 493, 494.

**Admission to the intensive major** Students should apply to the director of undergraduate studies by the last day of classes in the spring term of their junior year. In special circumstances, applications may be accepted through the end of registration period in the first term of the senior year. Applications should include a one-page statement of interest that includes a list of relevant courses taken and identifies a prospective senior essay adviser. Admission is based on performance and promise. The director of undergraduate studies and the senior essay adviser serve as advisers to candidates for the intensive major.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** 1 freshman sem or intro course (SOCY 110–149) or equivalent

**Number of courses** 13 term courses (incl prereq and senior essay)

**Specific courses required** *Programs I and II*—SOCY 151, 152, 160, 1 addtl Sociology course numbered 161–169; *Program III*—SOCY 321

**Distribution of courses** *Program I*—at least 11 courses in Sociology, as specified; 1 Sociology sem at 300 level; *Program II*—9 or 10 courses in Sociology, as specified; at least 1 Sociology sem at 300 level; *Program III*—at least 9 courses in Sociology, as specified; 2 methods courses, at least one in network analysis and another in stat; 1 intermediate or advanced course in economic sociology; 1 intermediate or advanced course in microecon

**Senior requirement** *Nonintensive major*—1 addtl 300-level Sociology sem and senior essay (SOCY 491); *Intensive major*—two-term senior essay (SOCY 493, 494)

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## Freshman Seminar

\* **SOCY 086a, Chinese Society since Mao** Deborah Davis

An overview of the major social institutions in contemporary China, with a focus on the changing relationship between individual and society. Use of print and visual sources to explore the social consequences of China's recent retreat from socialism and its rapid integration into the global economy. May count toward the Sociology major as an intermediate course. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO

## Introductory Courses

### **SOCY 116b, Markets, Culture, and Globalization** Frederick Wherry

The effects of the global economy on indigenous cultural and economic practices. The arguments presented by proponents and opponents of globalization. Definitions of globalization and culture; cultural tourism and branding; cultural markets; fair trade.

SO

### **SOCY 126b / HLTH 140b, Health of the Public** Nicholas Christakis

Biological and social factors that jointly determine the health of individuals and populations. The influence of medical care, social networks, and socioeconomic inequality on illness, recovery, and death.

SO

### **SOCY 133a, Computers, Networks, and Society** Scott Boorman

Comparison of major algorithm-centered approaches to the analysis of complex social network and organizational data. Fundamental principles for developing a disciplined and coherent perspective on the effects of modern information technology on societies worldwide. Software warfare and algorithm sabotage; blockmodeling and privacy; legal, ethical, and policy issues. No prior experience with computers required.

SO RP

### **SOCY 134a / ER&M 264a / WGSS 110a, Sex and Gender in Society** Rene Almeling

Introduction to the social processes through which people are categorized in terms of sex and gender, and how these social processes shape individual experiences of the world. Sex and gender in relation to race/ethnicity, class, sexuality, nationality, education, work, family, reproduction, and health.

SO

### **SOCY 147b, Introduction to Social Policy Analysis** Scott Boorman

The capabilities and limitations of four fundamental tools of policy: markets, networks, bureaucracy, and legislation. Examples from the policy history of the United States since the 1930s and from formal models of social structure and process.

SO

## Courses in Sociological Theory

Open to all students without prerequisite.

### **SOCY 151a / HUMS 302a / PLSC 290a, Foundations of Modern Social Theory**

Emily Erikson

Major works of social thought from the beginning of the modern era through the 1920s. Attention to social and intellectual contexts, conceptual frameworks and methods, and contributions to contemporary social analysis. Writers include Hobbes, Locke, Rousseau, Kant, Adam Smith, Marx, Freud, Peirce, Weber, and Durkheim.

SO

### \* **SOCY 152b, Topics in Contemporary Social Theory** Ron Eyerman

An examination of central issues in contemporary social theory. Influential thinkers and their responses to changes in the modern world since the Second World War. Topics include the nature of modern society and the human condition, the selection of rulers, power, punishment, torture, national trauma, and individual and collective identity.

SO

## Courses in Sociological Methods

### \* **SOCY 160a, Methods of Inquiry** Philip Smith

The theory and practice of social inquiry. How social scientists—and aspiring social scientists—actually do their work, including designing research, sampling and

measuring, and interpreting results. Examination of thesis proposal writing; ethical quandaries involved in social research. No background in social research assumed. SO

\* **SOCY 162a, Methods in Quantitative Sociology** Vida Maralani

Introduction to methods for reading and conducting quantitative sociological research. Data description and graphical approaches to data analysis; elementary probability theory; assumptions and properties of bivariate and multivariate linear regression; regression diagnostics. QR, SO

\* **SOCY 167b, Social Networks and Society** Emily Erikson

Introduction to the theory and practice of social network analysis. The role of social networks in contemporary society; basic properties of network measures, matrices, and statistics. Theoretical concepts such as centrality and power, cohesion and community, structural holes, duality of persons and groups, small worlds, and diffusion and contagion. Use of social structural, dynamic, and statistical approaches, as well as network analysis software. No background in statistics required. SO

\* **SOCY 169b, Visual Sociology** Philip Smith

Introduction to themes and methods in visual sociology. The role and use of visual information in social life, including images, objects, settings, and human interactions. Ethnographic photography, the study of media images, maps and diagrams, observation and coding of public settings, unobtrusive measures, and the use of internet resources. SO

## Intermediate Courses

The prerequisite for intermediate courses is one introductory Sociology course or permission of the instructor.

**SOCY 172b / PLSC 415b, Religion and Politics** Sigrun Kahl

Challenges to the view of religion as an archaic force destined to dwindle away in a secularized society. A historical and comparative investigation of the relationship between religion and politics in Europe and the United States, with comparisons to the Muslim world. SO

\* **SOCY 214b, Sociology of Tourism** Philip Smith

The social origins of tourism and the nature and organization of tourist experiences. Focus on insights from cultural theory and on case studies. The theoretical critique of tourism, the construction of meaning, the role of tours and guides, and the proliferation of alternatives to mass tourism. SO

\* **SOCY 216a / EP&E 267a / WGSS 314a, Social Movements** Ron Eyerman

An introduction to sociological perspectives on social movements and collective action, exploring civil rights, student movements, global justice, nationalism, and radical fundamentalism. SO

\* **SOCY 228b, Norms and Deviance** Elijah Anderson

A sociological analysis of the origins, development, and reactions surrounding deviance in contemporary society. Group labeling, stigma, power, and competing notions of propriety. SO

\* **SOCY 232b / AFST 348b / MMES 291b, Islamic Social Movements**

Jonathan Wyrzten

Social movement and network theory used to analyze the emergence and evolution of Islamic movements from the early twentieth century to the present. Organization, mobilization, and framing of political, nonpolitical, militant, and nonmilitant movements; transnational dimensions of Islamic activism. Case studies include the Muslim Brotherhood, Hamas, Hizbollah, Al-Qaeda, Al-Adl wa-Ihsann, and Tablighi Jama'at. SO

\* **SOCY 233b, Political Sociology** Nicholas Wilson

An overview of perspectives, issues, and arguments in political sociology. The nature of power and the state, the rise of the modern state, and democracy, authoritarianism, and revolutions. Additional topics include social movements, citizenship, nationalism, gender, and globalization. Classical and contemporary readings. SO

\* **SOCY 240b, The Urban Street Gang** Andrew Papachristos

The character, composition, and consequences of modern street gangs. Focus on the institutionalization of gangs in lower-class urban neighborhoods. Theoretical perspectives on gang formation, persistence, and behavior, as well as methodological issues in gang research. Policy responses ranging from law enforcement to community-based strategies. SO

## Advanced Courses

Courses in this category are open to students who have completed one intermediate course and any other specified requirement, or by permission of the instructor. Preference is given to Sociology majors in their junior and senior years.

\* **SOCY 310b / EAST 410b, Civil Society, Public Sphere, and Civic Life in Contemporary China** Deborah Davis

The changing character of civil society and the public sphere under various political conditions in modern China. Key themes are the possibilities for civic action, citizenship, and state-society relations. Prerequisite: a previous course on modern China or extended residence in Taiwan, Hong Kong, or the People's Republic of China. Preference to majors in Sociology or East Asian Studies in their junior and senior years. SO

\* **SOCY 313b, Sociology of the Arts and Popular Culture** Ron Eyerman

An advanced introduction to sociological perspectives on the arts and popular culture. Emphasis on the conceptualization of culture within social theory, with the aim of interpreting cultural expressions and artifacts—artworks, music, television, film, and literature. SO

\* **SOCY 314b / AFAM 273b / WGSS 316b, Inequality in America** Vida Maralani

Empirical, theoretical, and methodological issues involved in the study of inequalities in occupation, income, wealth, education, health, and neighborhoods. Intergenerational mobility, marriage and family processes, and inequalities of race, ethnicity, and gender. Questions include whether the United States is a land of opportunity and how different social groups fare and why. WR, SO

\* **SOCY 319a / ER&M 419a, Ethnography of the African American Community**

Elijah Anderson

An ethnographic study of the African American community. Analysis of ethnographic and historical literature, with attention to substantive, conceptual, and methodological issues. Topics include the significance of slavery, the racial ghetto, structural poverty, the middle class, the color line, racial etiquette, and social identity. SO

\* **SOCY 321a, Sociology of Markets** Frederick Wherry and Devin Singh

The role of culture and politics in shaping markets. Links between social networks and employment discrimination, religion and wealth, social relationships and financial troubles, and culture and industry. The moral dimensions of selling organs and intimacy. WR, SO

\* **SOCY 339b / AFST 373b / GLOBL 362b / MMES 282b, Imperialism, Insurgency, and State Building in the Middle East and North Africa** Jonathan Wyrzten

The historical evolution of political order from Morocco to Central Asia in the past two centuries. Focus on relationships between imperialism, insurgency, and state building. Ottoman, European, and nationalist strategies for state building; modes of local resistance; recent transnational developments; American counterinsurgency and nation-building initiatives in the region. SO

\* **SOCY 343a / EP&E 273a / MMES 343a / RLST 291a, Sociology of Islam**

Jonathan Wyrzten

Social scientific studies of Islam; introduction to sociology of religion and its application to Islam; the utility of "Islam" and "Muslim" as analytical categories; debates about definitions of Islam and religion in anthropology and religious studies; comparative sociological studies both within Islam and contrasting Islam with other religions. SO

\* **SOCY 352a, Material Culture and Iconic Consciousness** Jeffrey Alexander

Exploration of how and why modern and postmodern societies have continued to sustain material symbolism and iconic consciousness. Theoretical approaches to debates about icons and symbols in philosophy, sociology, linguistics, psychoanalysis, and semiotics. Iconography in advertisements and branding, food and bodies, nature, fashion, celebrities, popular culture, art, architecture, and politics. HU, SO

\* **SOCY 357b, Neighborhoods and Crime** Andrew Papachristos

The "city problem" of crime contrasted in a variety of neighborhoods; reasons why some neighborhoods have higher rates of crime than others. Topics include street gangs, the underground economy, immigration, and mass incarceration. Attention to ecological, social structural, and cultural aspects of city life. SO

\* **SOCY 361b / WGSS 361b, Demography, Gender, and Health** Vida Maralani

Comparative survey of research in demography. The interplay of population processes and socioeconomic development; trends in fertility, mortality, aging, and health in both richer and poorer nations; the relationship between women's status and health and demographic outcomes. Readings from a variety of fields, including demography/sociology, economics, epidemiology, and public health. WR, SO

\* **SOCY 363a / ER&M 362a / GLOBL 384a, Genocide and Ethnic Conflict**

Jasmina Besirevic Regan

Exploration of the explosion of genocide and violent ethnic conflict in the past seventy years, including contributory historical and political elements. Consideration of ways

to prevent or resolve such conflicts. Focus on questions of identity, religion, class, and nationhood as related to violence and conflict. An analytical framework developed from four case studies: the Holocaust, Cambodia, the former Yugoslavia, and Rwanda. SO

\* **SOCY 369b / EP&E 258b / PLSC 446b, Welfare States across Nations** Sigrun Kahl  
How different societies counterbalance capitalism and deal with social risks. Welfare state regimes and their approaches to inequality, unemployment, poverty, illness, disability, child rearing, and old age. Why the United States has an exceptionally small welfare state. SO

\* **SOCY 374b / EAST 443b, Collective Memories in East Asia** Staff  
Contemporary collective memory issues explored in the context of political forces and social changes in East Asia. Topics include general theories, nation-states and memories, wars and atrocities, and politics and memories. Readings from sociology, history, anthropology, and cultural studies. HU

\* **SOCY 395a / EAST 408a / EP&E 269a, Wealth and Poverty in Modern China**  
Deborah Davis  
The underlying causes and consequences of the changing distribution of income, material assets, and political power in contemporary China. Substantive focus on inequality and stratification. Instruction in the use of online Chinese resources relevant to research. Optional weekly Chinese language discussions. Prerequisite: a previous course on China since 1949. SO

## Individual Study and Research Courses

\* **SOCY 471a and SOCY 472b, Individual Study** Frederick Wherry  
Individual study for qualified juniors and seniors under faculty supervision. To register for this course, each student must submit to the director of undergraduate studies a written plan of study that has been approved by a faculty adviser.

\* **SOCY 491a or b, Senior Essay and Colloquium for Nonintensive Majors**  
Rene Almeling  
Independent library-based research under faculty supervision. To register for this course, students must submit a written plan of study approved by a faculty adviser to the director of undergraduate studies no later than the end of registration period in the term in which the senior essay is to be written. The course meets biweekly, beginning in the first week of the term.

\* **SOCY 493a and SOCY 494b, Senior Essay and Colloquium for Intensive Majors**  
Frederick Wherry  
Independent research under faculty direction, involving empirical research and resulting in a substantial paper. Workshop meets biweekly to discuss various stages of the research process and to share experiences in gathering and analyzing data. The first meeting is in the second week of the term.

## South Asian Studies

Director of undergraduate studies: Tariq Thachil, 115 Prospect St., 432-8161,  
tariq.thachil@yale.edu; www.yale.edu/macmillan/southasia



## FACULTY ASSOCIATED WITH THE PROGRAM OF SOUTH ASIAN STUDIES

**Professors** Akhil Amar (*Law School*), Tim Barringer (*History of Art*), Vasudha Dalmia (*Religious Studies*), Nihal de Lanerolle (*School of Medicine*), Michael Dove (*Anthropology, Forestry & Environmental Studies*), Sara Suleri Goodyear (*English*), Phyllis Granoff (*Religious Studies*), Inderpal Grewal (*Women's, Gender, & Sexuality Studies*), Kalyanakrishnan Sivaramakrishnan (*Anthropology, Forestry & Environmental Studies*), Shyam Sunder (*School of Management*), Steven Wilkinson (*Political Science*)

**Associate Professors** Mayur Desai (*Public Health*), Zareena Grewal (*Ethnicity, Race & Migration*), Karuna Mantena (*Political Science*), Kishwar Rizvi (*History of Art*), Ashwini Deo (*Linguistics*)

**Assistant Professors** Andrew Quintman (*Religious Studies*), Tamara Sears (*History of Art*), Tariq Thachil (*Political Science*)

**Senior Lecturers** Carol Carpenter (*Anthropology, Forestry & Environmental Studies*), Geetanjali Singh Chanda (*Women's, Gender, & Sexuality Studies*)

**Lecturers** Hugh Flick, Jr. (*Religious Studies*), Elizabeth Hanson (*Political Science*), Stanley Scott (*Music*)

**Senior Lectors** Seema Khurana, Swapna Sharma, David Brick

The program in South Asian Studies combines the requirements of a discipline-based first major with significant course work in South Asian Studies. South Asian Studies can be taken only as a second major. The major is intended to provide students with a broad understanding of the history, culture, and languages of South Asia, as well as the region's current social, political, and economic conditions. Work in a discipline-based major coupled with a focus on South Asia prepares students for graduate study, employment in nongovernmental organizations, or business and professional careers in which an understanding of the region is essential.

The South Asian Studies major permits students to choose courses from a wide range of disciplines. Individual programs should have a balance between courses in the humanities and those in the social sciences. The proposed course of study must be approved each term by the director of undergraduate studies. Students should also identify an adviser from the South Asian Studies faculty in their area of specialization as early as possible.

Permission to complete two majors must be secured from the Committee on Honors and Academic Standing. Application forms are available from the residential college deans and must be submitted prior to the student's final term.

**Requirements of the major** In addition to fulfilling the requirements of the primary major, a student choosing South Asian Studies as a second major must complete seven term courses in South Asian Studies numbered 200 or above. At least two of the seven courses must address premodern South Asia, and at least two should be seminars. Students may petition the director of undergraduate studies to include one relevant course from another department or program; approval may require additional course work on South Asian topics. Students must also complete the senior requirement and

meet the major's language requirement. A maximum of one course taken Credit/D/Fail may count toward the major.

**Language requirement** One South Asian language must be studied at the advanced level (L5). Students who matriculate with advanced proficiency in a South Asian language (excluding English), as demonstrated through testing, are encouraged to study Sanskrit, or to study a second modern language through Yale courses or the Directed Independent Language Study program. Students may request substitution of another appropriate language (e.g., Persian or Arabic) for the core language requirement, and they are encouraged to pursue intensive language study through courses or work abroad.

**Senior requirement** The senior requirement may be fulfilled by completion of a seminar that culminates in a senior essay. Alternatively, the requirement may be fulfilled by completion of a one-credit, two-term senior research project in SAST 491, 492, or by completion of a one-term, one-credit directed study in SAST 486 that culminates in a senior essay. The senior essay should be a substantial paper with a maximum length of 8,000 words for one term and 10,500 words for two terms. The use of primary materials in the languages of the region is encouraged in senior essay projects. The director of undergraduate studies must approve senior essay plans early in the student's senior year.

**Courses in the Graduate School** Graduate courses in South Asian Studies are open to qualified undergraduates. Course descriptions appear in the online Graduate School bulletin and are also available in the South Asian Studies program office. Permission of the instructor and of the director of graduate studies is required.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 7 term courses (not incl senior req or lang req)

**Distribution of courses** 7 courses in South Asian Studies numbered 200 or above, 2 in premodern, 2 sems

**Substitution permitted** One relevant course in another dept, and/or up to 3 study abroad credits with DUS permission

**Language requirement** Study in a South Asian lang through L5 level

**Senior requirement** Senior essay in sem, or research project in SAST 491, 492, or senior essay in SAST 486

## Language and Literature Courses

\* **BNGL 110a, Introductory Bengali I** Staff

A comprehensive approach to learning all four language skills: speaking, listening, reading, and writing. At the completion of the two-term sequence students are able to read and write in Bengali, and to converse in formal and informal situations. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. Credit only on completion of BNGL 120. L1 1½ Course cr

**\* BNGL 120b, Introductory Bengali II** Staff

Continuation of BNGL 110. Prerequisite: BNGL 110 or equivalent. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L2 1½ Course cr

**\* BNGL 130a, Intermediate Bengali I** Staff

The first half of a two-term sequence designed to develop intermediate proficiency in Bengali. Review of major grammar topics. Emphasis on expanding vocabulary, developing effective reading strategies, and improving listening comprehension. Readings, discussion, and written work focus on cultural topics in the Bengali-speaking world. Prerequisite: BNGL 120 or equivalent. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L3

**\* BNGL 140b, Intermediate Bengali II** Staff

The second half of a two-term sequence designed to develop intermediate proficiency in Bengali. Review of major grammar topics. Emphasis on expanding vocabulary, developing effective reading strategies, and improving listening comprehension. Readings, discussion, and written work focus on cultural topics in the Bengali-speaking world. Prerequisite: BNGL 130 or equivalent. Course taught through distance learning using videoconferencing technology from Cornell University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L4

**\* HNDI 110a, Elementary Hindi I** Seema Khurana

An in-depth introduction to modern Hindi, including the Devanagari script. A combination of graded texts, written assignments, audiovisual material, and computer-based exercises provides cultural insights and increases proficiency in understanding, speaking, reading, and writing Hindi. Emphasis on spontaneous self-expression in the language. No prior background in Hindi assumed. Credit only on completion of HNDI 120. L1 1½ Course cr

**HNDI 120b, Elementary Hindi II** Staff

Continuation of HNDI 110. After HNDI 110 or equivalent. L2 1½ Course cr

**HNDI 130a, Intermediate Hindi I** Staff

The first half of a two-term sequence designed to develop proficiency in the four language skills. Extensive use of cultural documents including feature films, radio broadcasts, and literary and nonliterary texts to increase proficiency in understanding, speaking, reading, and writing Hindi. Focus on cultural nuances and Hindi literary traditions. Emphasis on spontaneous self-expression in the language. After HNDI 120 or equivalent. L3 1½ Course cr

**\* HNDI 132a or b, Accelerated Hindi I** Staff

A fast-paced course designed for students who are able to understand basic conversational Hindi but who have minimal or no literacy skills. Introduction to the Devanagari script; development of listening and speaking skills; vocabulary enrichment; attention to sociocultural rules that affect language use. Students learn to read simple texts and to converse on a variety of everyday personal and social topics.

**HNDI 140a or b, Intermediate Hindi II** Staff

Continuation of HNDI 130. After HNDI 130 or equivalent. L4 1½ Course cr

**\* HNDI 142b, Accelerated Hindi II** Staff

Continuation of HNDI 132. Development of increased proficiency in the four language skills. Focus on reading and higher language functions such as narration, description, and comparison. Reading strategies for parsing paragraph-length sentences in Hindi newspapers. Discussion of political, social, and cultural dimensions of Hindi culture as well as contemporary global issues. L4

**HNDI 150a, Advanced Hindi** Staff

An advanced language course aimed at enabling students to engage in fluent discourse in Hindi and to achieve a comprehensive knowledge of formal grammar. Introduction to a variety of styles and levels of discourse and usage. Emphasis on the written language, with readings on general topics from newspapers, books, and magazines. Prerequisite: HNDI 140 or permission of instructor. L5

**\* HNDI 159b, Hindi Literature and Public Culture** Staff

An advanced language course that develops language skills through selected readings of Hindi literature and the study of popular culture. Focus on the adaptations of literary works of Prem Chand, Mannoo Bhandhari, Sharat Chandra, and Amrita Pritam in popular culture, cinema, theater, and television dramas. Prerequisite: HNDI 150. L5

**\* HNDI 198a or b, Advanced Tutorial** Staff

For students with advanced Hindi language skills who wish to engage in concentrated reading and research on material not otherwise offered by the department. Work must be supervised by an adviser and must terminate in a term paper or the equivalent. Permission to enroll requires submission of a detailed project proposal and its approval by the language studies coordinator. Prerequisite: HNDI 150 or equivalent.

**\* SKRT 110a / LING 115a, Introductory Sanskrit I** Staff

An introduction to Sanskrit language and grammar. Focus on learning to read and translate basic Sanskrit sentences in Devanagari script. No prior background in Sanskrit assumed. L1 1½ Course cr

**SKRT 120b / LING 125b, Introductory Sanskrit II** Staff

Continuation of SKRT 110. Focus on the basics of Sanskrit grammar; readings from classical Sanskrit texts written in Devanagari script. After SKRT 110. L2 1½ Course cr

**SKRT 130a / LING 138a, Intermediate Sanskrit I** Staff

The first half of a two-term sequence aimed at helping students develop the skills necessary to read texts written in Sanskrit. Readings include selections from the *Hitopadesa*, *Kathasaritsagara*, *Mahabharata*, and *Bhagavadgita*. After SKRT 120 or equivalent. L3 1½ Course cr

**SKRT 140b / LING 148b, Intermediate Sanskrit II** Staff

Continuation of SKRT 130, focusing on Sanskrit literature from the *kavya* genre. Readings include selections from the *Jatakamala* of Aryasura and the opening verses of Kalidasa's *Kumarasambhava*. After SKRT 130 or equivalent. L4 1½ Course cr

**\* TAML 110a, Introductory Tamil I** Staff

An in-depth introduction to modern Tamil, focusing on skills in comprehension, speaking, reading, and writing as well as on cultural understanding. Course work includes graded texts, written assignments, audiovisual material, and computer-

based exercises. No prior background in Tamil assumed. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. Credit only on completion of TAML 120. L1 1½ Course cr

**TAML 120b, Introductory Tamil II** Staff

Continuation of TAML 110. After TAML 110. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L2 1½ Course cr

**TAML 130a, Intermediate Tamil I** Staff

The first half of a two-term sequence designed to develop proficiency in comprehension, speaking, reading, and writing through the use of visual media, newspapers and magazines, modern fiction and poetry, and public communications such as pamphlets, advertisements, and government announcements. Prerequisite: TAML 120 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L3 RP 1½ Course cr

**\* TAML 140b, Intermediate Tamil II** Staff

The second half of a two-term sequence designed to develop proficiency in listening, speaking, reading, and writing. Focus on the communicative aspects of the language. Some attention to Tamil culture since the Sangam period. Prerequisite: TAML 130 or equivalent. Course taught through distance learning using videoconferencing technology from Columbia University. Enrollment limited; interested students should e-mail [minjin.hashbat@yale.edu](mailto:minjin.hashbat@yale.edu) for more information. L4 1½ Course cr

## General Courses in South Asian Studies

**\* SAST 020b / HIST 039b, Mumbai: Life in a Megacity** Rohit De

Mumbai as a case study for the transformations brought by urbanization and modernity in Asia. Focus on how Mumbai's residents and its planners navigated the challenges of living in a rapidly growing cosmopolitan city and reflected it in their art and ideas. Themes include capitalism, globalization, British empire, religious pluralism, radical politics, organized crime, and Bollywood. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. WR, HU

**SAST 219a / ANTH 276a, South Asian Social Worlds** Staff

Study of a series of texts that introduce anthropological and critical approaches to South Asia's peoples and cultures while questioning the historical and political possibility of understanding such a diverse region. WR, SO

**SAST 221a / HIST 310a, History of Modern South Asia** Julia Stephens

Survey of the Indian subcontinent's history from colonial rule, through nationalist resistance, to postcolonial history. The establishment of British dominion; colonial transformation of Indian politics, society, economy, and culture; nationalism before and after Gandhi; the partition of India; and recent developments in South Asia. HU

**SAST 224b / HIST 396b, India and Pakistan since 1947** Rohit De

Introduction to the history of the Indian subcontinent from 1947 to the present. Focus on the emergence of modern forms of life and thought, the impact of the partition on

state and society, and the challenges of democracy and development. Transformations of society, economy, and culture; state building; economic policy. HU

**SAST 244a / PLSC 384a, Indian Democracy in Comparative Perspective**

Tariq Thachil

Introduction to the major dimensions of Indian democracy; comparison with the political experiences of other developing nations such as China, South Africa, Brazil, and Egypt. Topics include colonial legacies, identity politics, social movements, and social and human development. SO

**SAST 259b / MUSI 357b, Indian Music Theory and Practice** Stanley Scott

Introduction to the concepts and culture of music in South Asia from Vedic times to the present, with a focus on North Indian classical music. Discussion of history and theory is enriched by practical instruction and live performances. Topics include raga (melody), tala (meter), musical forms, improvisation, patronage, religion, and gender, with forays into folk music and film. No previous experience in Indian classical music required. HU

**SAST 262a, Tibetan Buddhism** Andrew Quintman

Introduction to major themes in Tibetan Buddhist thought and practice. Buddhist ethics, systems of monastic and ascetic life, ritual applications, sacred geography and pilgrimage, lay religion, and the status of Buddhism in Chinese-occupied Tibet and in the West. HU

**\* SAST 310b / FILM 317b, Understanding Bollywood** Staff

Critical introduction to popular cinema of South Asia, its history, culture, and politics. Topics include nationalism, partition, gender, secularism, development, globalization, and diaspora. HU

**\* SAST 341a or b / EP&E 481a or b / PLSC 442a or b, Development in South Asia**

Staff

Introduction to issues surrounding political and economic development in South Asia. Successes and failures of modernization, including the influence of intellectual trends and their derivative policy prescriptions. Foundational perspectives on development and the policies they yielded; empirical treatments of the experiences of South Asian countries in the postcolonial era. SO

**\* SAST 343a / PLSC 348a, Indian Elections and the Media** Divya Devasher

Introduction to the dynamics of elections in India, including the foundations of democratic politics, the role of political elites, the sources of political differences, and the role of the media to inform and influence outcomes. How voters and politicians make decisions; the role of identity in elections; sources of news that different audiences receive. SO

**\* SAST 358a / RLST 184a, The Ramayana** Hugh Flick

Exploration of the religious and ideological interpretations of this epic of ancient India as manifested in performance and in written texts. Emphasis on the religious and historical contexts from which the texts emerged. All readings in translation. HU TR

**\* SAST 360b, Introduction to Bhakti Literature** Swapna Sharma

Study of bhakti (devotional literature) in North India, beginning in the sixteenth century. Resistance to Brahmanical forms of social dominance; the role of linguistically

based power; the development of vernacular languages and the national language of India. HU

\* **SAST 379b / LING 248b, Indo-Aryan Languages** Ashwini Deo

Introduction to the Indo-Aryan language family, its linguistic context, and its evolution from the ancient period to the present. Focus on comparative morphosyntax and semantic phenomena, with some attention to issues of classification and contact. SO

\* **SAST 449b / WGSS 449b, Fictions of Indian Women** Geetanjali Chanda

An exploration of Indian womanhood through novels and short stories by Indian women. Focus on postindependence women's writings in English in India, and on concepts of nation, home, and identity. WR, HU

\* **SAST 458a / ER&M 328a / WGSS 328a, Popular Culture and Postcolonial India**  
Geetanjali Chanda

A study of films and literature of South Asians living, working, and directing in Canada, the United Kingdom, and the United States. Questions of commercial populism, authenticity, and postcolonial identity. WR

\* **SAST 459b, Buddhist Traditions of Mind and Meditation** Andrew Quintman

Buddhist meditation practices examined in the context of traditional theories of mind, perception, and cognition. Readings both from Buddhist canonical works and from secondary scholarship on cognitive science and ritual practice. Recommended preparation: a course in Asian religions. HU

\* **SAST 486a or b, Directed Study** Tariq Thachil

A one-credit, single-term course on topics not covered in regular offerings. To apply for admission, a student should present a course description and syllabus to the director of undergraduate studies, along with written approval from the faculty member who will direct the study.

## Senior Essay Course

\* **SAST 491a and SAST 492b, Senior Essay** Tariq Thachil

A yearlong research project completed under faculty supervision and resulting in a substantial paper. Credit for SAST 491 only on completion of SAST 492.

½ Course cr per term

## Southeast Asia Studies

Program chair: Benedict Kiernan, 311 LUCE, 432-3431, seas@yale.edu; www.yale.edu/seas

### FACULTY ASSOCIATED WITH THE COUNCIL ON SOUTHEAST ASIA STUDIES

**Professors** William Burch (*Emeritus*) (*Forestry & Environmental Studies*), Harold Conklin (*Emeritus*) (*Anthropology*), Michael Dove (*Forestry & Environmental Studies*), J. Joseph Errington (*Anthropology*), Benedict Kiernan (*History*), James Scott (*Political Science*), Frederick Wherry (*Sociology*), Mimi Yiengpruksawan (*History of Art*)

**Associate Professor** Erik Harms (*Anthropology*)

**Senior Lecturer** Carol Carpenter (*Forestry & Environmental Studies, Anthropology*)

**Lecturer** Amity Doolittle (*Forestry & Environmental Studies*)

**Senior Lector II** Quang Phu Van

**Senior Lector** Indriyo Sukmono

**Lector** Dinny Risri Aletheiani

The Council on Southeast Asia Studies oversees an interdisciplinary program that brings together faculty and students sharing an interest in Southeast Asia and supplements the undergraduate curriculum with an annual seminar series, periodic conferences, and special lectures. Yale does not offer a degree in Southeast Asia studies. Majors in any department may consult with Council faculty regarding a senior essay on a Southeast Asian topic, and in certain circumstances students who have a special interest in the region may consider a Special Divisional Major. Students planning to undertake field research or language study in Southeast Asia may apply to the Council for summer fellowship support.

Courses featuring Southeast Asian content are offered within a variety of departments each year, including Anthropology, Economics, History, Music, and Political Science. A list of courses for the current year can be obtained through the Council office or Web site (<http://www.yale.edu/seas/Courses.htm>). Yale maintains extensive library and research collections on Southeast Asia.

Language instruction is offered in two Southeast Asian languages, Indonesian and Vietnamese. The Council on Southeast Asia Studies supports language tables and tutoring in other Southeast Asian languages by special arrangement.

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## Indonesian Courses

\* **INDN 110a, Elementary Indonesian I** Indriyo Sukmono

An introductory course in standard Indonesian with emphasis on developing communicative skills through a systematic survey of grammar and graded exercises. Credit only on completion of INDN 120. Enrollment limited to 15 per section. L1 1½ Course cr

\* **INDN 120b, Elementary Indonesian II** Indriyo Sukmono

Continuation of INDN 110. Introduction to reading, leading to mastery of language patterns, essential vocabulary, and basic cultural competence. After INDN 110 or equivalent. Enrollment limited to 15 per section. L2 1½ Course cr

\* **INDN 130a, Intermediate Indonesian I** Dinny Risri Aletheiani

Continued practice in colloquial Indonesian conversation and reading and discussion of texts. After INDN 120 or equivalent. Limited enrollment. L3 1½ Course cr

\* **INDN 140b, Intermediate Indonesian II** Dinny Risri Aletheiani

Continuation of INDN 130. After INDN 130 or equivalent. Limited enrollment. L4 1½ Course cr

\* **INDN 150a, Advanced Indonesian I** Staff

Development of advanced fluency through discussion of original Indonesian sociohistorical, political, and literary texts and audiovisual sources. Extension of



cultural understanding of Indonesia. Prerequisite: INDN 140 or equivalent. May not be taken after INDN <153>. L5

\* **INDN 160b, Advanced Indonesian II** Indriyo Sukmono  
Continuation of INDN 150. Prerequisite: INDN 150 or equivalent. L5

\* **INDN 470a and INDN 471b, Independent Tutorial** Staff  
For students with advanced Indonesian language skills who wish to engage in concentrated reading and research on material not otherwise offered in courses. The work must be supervised by an adviser and must terminate in a term paper or its equivalent. After INDN 160. Permission to enroll requires submission of a detailed project proposal and its approval by the program adviser.

## Vietnamese Courses

**VIET 110a, Elementary Vietnamese I** Quang Phu Van  
Students acquire basic working ability in Vietnamese, developing skills in speaking, listening, writing (Roman script), and reading. Discussion of aspects of Vietnamese society and culture. Credit only on completion of VIET 120. Intended for students with no previous knowledge of Vietnamese. L1 RP 1½ Course cr

**VIET 120b, Elementary Vietnamese II** Quang Phu Van  
Continuation of VIET 110. L2 RP 1½ Course cr

\* **VIET 130a, Intermediate Vietnamese I** Quang Phu Van  
An integrated approach to language learning aimed at strengthening students' listening, speaking, reading, and writing skills in Vietnamese. Communicative activities such as conversations, performance simulation, drills, role plays, and games. Discussion of aspects of Vietnamese society and culture. After VIET 120 or equivalent. L3 RP 1½ Course cr

\* **VIET 132a, Accelerated Vietnamese** Quang Phu Van  
An accelerated course designed for students who understand and speak informal Vietnamese on topics related to everyday situations but who have minimal or no literacy skills. Development of grammatical accuracy and overall competence in speaking, reading, and writing. Topics include the alphabet, diacritical marks, kinship terms, food culture, forms of politeness and sociocultural rules, and formal and informal language. Admits to VIET 140. L3

**VIET 140b, Intermediate Vietnamese II** Quang Phu Van  
Continuation of VIET 130. Prerequisite: VIET 130 or equivalent. L4 1½ Course cr

**VIET 150b, Advanced Vietnamese** Quang Phu Van  
Students improve their fluency and accuracy in Vietnamese and solidify their reading, writing, speaking, and listening skills. Topics include social, economic, and cultural practices, gender issues, notions of power, and taboo. Prerequisite: VIET 140 or equivalent. L5

\* **VIET 470a and VIET 471b, Independent Tutorial** Quang Phu Van  
For students with advanced Vietnamese language skills who wish to engage in concentrated reading and research on material not otherwise offered in courses. The work must be supervised by an adviser and must terminate in a term paper or its

equivalent. Permission to enroll requires submission of a detailed project proposal and its approval by the program adviser.

## Spanish

Director of undergraduate studies: Susan Byrne, Rm. 205, 82–90 Wall St., 432-1162, susan.byrne@yale.edu; language program director: Ame Cividanes, Rm. 210, 82–90 Wall St., 432-1159, ame.cividanes@yale.edu; span-port.yale.edu

### FACULTY OF THE DEPARTMENT OF SPANISH AND PORTUGUESE

**Professors** Rolena Adorno (*Chair*), Aníbal González, Roberto González Echevarría, K. David Jackson, Noël Valis

**Associate Professors** Susan Byrne, Paulo Moreira

**Assistant Professors** Leslie Harkema, Kevin Poole

**Senior Lectors II** Margherita Tortora, Sonia Valle

**Senior Lectors** Sybil Alexandrov, Marta Almeida, Pilar Asensio, Mercedes Carreras, Ame Cividanes, Sebastián Díaz, Maripaz García, María Jordán, Rosamaría León, Juliana Ramos-Ruano, Lissette Reymundi, Lourdes Sabé-Colom, Bárbara Safille, Terry Seymour

**Lector** Selma Vital

The Department of Spanish and Portuguese provides instruction in the languages, literatures, and cultures of the Hispanic and Luso-Brazilian worlds. Courses in Portuguese and the requirements of the major are described under Portuguese (p. 594); the names of faculty teaching Portuguese courses are in the list above.

The major in Spanish is a liberal arts major that offers a wide range of courses in the language, literatures, and cultures of the twenty Spanish-speaking countries in Europe, Latin America, and the Caribbean. Today Spanish is the second language of the United States, one of the three most widely spoken languages in the world, and one of the five diplomatic languages of the United Nations. The program in Spanish offers students the opportunity to acquire thorough linguistic proficiency as well as in-depth knowledge of both cultural and literary topics. The major explores literature, history, philosophy, art, and cultural studies, and provides excellent preparation for careers in law, diplomacy, medicine, business, the arts, academics, journalism, and education.

Courses numbered SPAN 110–199 include beginning and intermediate language courses designed to help students develop fluency in understanding, speaking, reading, and writing Spanish. Courses numbered SPAN 200–299 seek to provide students with a broad but solid introduction to the fields of Hispanic literatures and cultures while strengthening their linguistic competence. Courses numbered 300–499 allow students to perfect their linguistic and critical skills through study of a specific problem or issue, e.g., a literary genre, a type of literary or cultural representation, or a specific writer or text. Students desiring more information about either language or literature offerings should consult the director of undergraduate studies.

**Placement** Students whose test scores demonstrate advanced ability in Spanish may enroll directly in any L5 course; scores that demonstrate advanced ability include a

placement of L5 on the departmental placement examination, a score of 5 on either of the Spanish Advanced Placement tests, a score of 6 or 7 on the Advanced-Level International Baccalaureate examination, or a proficiency level of C1 in the Common European Framework of Reference for Languages. All other students, including native speakers, who have previously studied Spanish formally or informally must take the departmental placement examination in order to enroll in a Spanish course.

**Placement examination and preregistration** Information about the departmental placement examination and about preregistration procedures for Spanish L1–L4 language courses is available on the departmental Web site (<http://span-port.yale.edu>).

**Language courses** Students with no previous formal or informal Spanish study ordinarily enroll in SPAN 110. Students who take SPAN 110 must continue with 120 in the following term, and no credit is awarded for 110 until 120 has been successfully completed. Students wishing to take intensive beginning Spanish may, with the instructor's permission, enroll in SPAN 125, which covers the same material as SPAN 110 and 120, but in one term. SPAN 132 and 142 are designed for heritage speakers and are available only to them. Admission to SPAN 132 and 142 is based on results of the departmental placement examination; interested students should contact the instructor.

**Prerequisite** Prerequisite to the major is SPAN 140, 142, or 145, or the equivalent through advanced placement or study abroad. Equivalent preparation to SPAN 140, 142, or 145 may be demonstrated by the test scores listed above under "Placement."

**The standard major** Beyond the prerequisite, twelve term courses are required, including the senior essay. With prior permission of the director of undergraduate studies, two relevant courses from other departments may be applied toward the major.

**Requirements of the major for the Class of 2015** Students must take SPAN 243, 244, or 250; SPAN 246 or 247; three courses chosen from SPAN 261, 262, 266, or 267; SPAN 491 (see "Senior requirement" below); five electives numbered SPAN 300 or higher; and one additional elective numbered SPAN 200 or higher. Successful completion of a special examination given at the beginning of each term may exempt Spanish majors from SPAN 243 and fulfill the requirement for SPAN 243, 244, or 250. Details about the examination may be obtained from the course instructor.

**Requirements of the major for the Class of 2016 and subsequent classes** Students must take SPAN 250; SPAN 246 or 247; three courses chosen from SPAN 261, 262, 266, or 267; SPAN 491 (see "Senior requirement" below); five electives numbered SPAN 300 or higher; and one additional elective numbered SPAN 200 or higher.

**Senior requirement** Seniors write the senior essay in SPAN 491 in the spring of their senior year under the individual direction of a faculty adviser. Students expecting to complete their degree requirements in December write the senior essay in SPAN 491 in the fall of their senior year. Seniors in SPAN 491 are expected to submit their completed essay to the director of undergraduate studies at 82–90 Wall Street by 4 p.m. on April 24 in the spring term, or by 4 p.m. on December 5 in the fall term. If the essay is submitted late without an excuse from the student's residential college dean, the penalty is one letter grade, though no essay that would otherwise pass will be failed because it is late.

**Intensive major** Students in the intensive major both present a senior essay and take a departmental examination.

**Two majors** Students electing Spanish as one of two majors should consult the director of undergraduate studies about a specialized course of study.

**Courses in the Graduate School** Juniors and seniors majoring in Spanish may, with permission of the instructor and the director of graduate studies, enroll in graduate literature courses in Spanish. A list of pertinent graduate courses is available at the office of the director of undergraduate studies.

**Study abroad** Students are encouraged to apply to the eight-week summer language courses offered by Yale Summer Session in New Haven and Bilbao, Spain; New Haven and Quito, Ecuador; or New Haven and Lima, Peru. A five-week Spanish course at the L5 level is also offered in Buenos Aires, Argentina. More information is available on the Yale Summer Session Web site (<http://summer.yale.edu>). For information about the Year or Term Abroad program, see under Special Arrangements (p. 63) in the Academic Regulations (p. 32). Students who wish to count courses taken abroad toward the major should consult with the director of undergraduate studies before going abroad.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** SPAN 140, 142, 145, or equivalent

**Number of courses** 12 term courses (incl senior req)

**Specific courses required** *Class of 2015*—SPAN 243, 244, or 250; SPAN 246 or 247; 3 from SPAN 261, 262, 266, 267; *Class of 2016 and subsequent classes*—SPAN 250; SPAN 246 or 247; 3 from SPAN 261, 262, 266, 267

**Distribution of courses** 5 electives numbered SPAN 300 or higher; 1 addtl elective numbered SPAN 200 or higher

**Substitution permitted** Up to 2 relevant courses in other depts, with DUS permission

**Senior requirement** *Standard major*—Senior essay (SPAN 491); *Intensive major*—Senior essay (SPAN 491) and dept exam

## Courses

\* **SPAN 060a, Freshman Colloquium: Literary Studies in Spanish** Susan Byrne  
Introduction to the study of literature in general and to some of the most important texts in Hispanic literature. Selected texts in Spanish include short stories, essays, lyric, and theater. Open to students who have placed into L5 courses. Counts toward the requirements of the Spanish major with permission of the director of undergraduate studies. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. L5, HU

\* **SPAN 110a or b, Elementary Spanish I** Staff  
For students who wish to begin study of the Spanish language. Development of basic skills in understanding, speaking, reading, and writing through a functional approach to the teaching of Spanish grammar. Includes an introduction to the cultures (traditions, art, literature, music) of the Spanish-speaking world. Audiovisual materials are incorporated into class sessions. Conducted in Spanish. To be followed immediately by SPAN 120. Credit only on completion of SPAN 120. L1 RP 1½ Course cr

**SPAN 120a or b, Elementary Spanish II** Staff

Further development of understanding, speaking, reading, and writing skills. Class sessions incorporate short authentic texts in Spanish, audiovisual materials, and film. Cultural topics of the Spanish-speaking world (traditions, art, literature, music) are included. Conducted in Spanish. After SPAN 110 or in accordance with placement results. Admits to SPAN 130 or 145. L2 RP 1½ Course cr

**\* SPAN 125a, Intensive Elementary Spanish** Maria Lourdes Sabé

An intensive beginning course in spoken and written Spanish that covers the material of SPAN 110 and 120 in one term. Conducted in Spanish. Admits to SPAN 130 or 145. Not open to students who have completed SPAN 110 or 120. L1, L2 RP 2 Course cr

**SPAN 130a or b, Intermediate Spanish I** Staff

Development of language proficiency in listening, speaking, reading, and writing through communicative activities rather than a sequence of linguistic units. Authentic Spanish language texts, films, and videos serve as the basis for the functional study of grammar and the acquisition of a broader vocabulary. Cultural topics are presented throughout the term. Conducted in Spanish. Admits to SPAN 140. L3 RP 1½ Course cr

**\* SPAN 132a, Spanish for Heritage Speakers I** Sybil Alexandrov

A language course designed for students who have been exposed to Spanish – either at home or by living in a Spanish-speaking country – but who have little or no formal training in the language. Practice in all four communicative skills (comprehension, speaking, reading, writing), with special attention to basic grammar concepts, vocabulary building, and issues particular to heritage speakers. Admission in accordance with placement results. L3

**SPAN 140a or b, Intermediate Spanish II** Staff

Continuation of SPAN 130. Development of increased proficiency in the four language skills. Greater precision in grammar usage, vocabulary enrichment, and expanded cultural awareness are achieved through communicative activities based on authentic Spanish-language texts, including a short novel. Conducted in Spanish. Admits to L5 courses. L4 RP 1½ Course cr

**\* SPAN 142b, Spanish for Heritage Speakers II** Sybil Alexandrov

Continuation of SPAN 132. Examination of complex grammar structures; consideration of problems particular to heritage speakers through the reading of both literary and journalistic texts. Practice in all communicative skills (comprehension, speaking, reading, writing). After SPAN 132 or in accordance with placement results. L4

**\* SPAN 145b, Intensive Intermediate Spanish** Bárbara Safille

An intensive intermediate course in spoken and written Spanish that covers the material of SPAN 130 and 140 in one term. Conducted in Spanish. Admits to L5 courses. Not open to students who have completed SPAN 130 or 140. L3, L4 RP 2 Course cr

**\* SPAN 222a, Legal Spanish** Mercedes Carreras

An introduction to Spanish and Latin American legal culture with a focus on the specific traits of legal language and on the development of advanced language competence. Issues such as human rights, the death penalty, the jury, contracts, statutory instruments, and rulings by the constitutional courts are explored through law journal articles, newspapers, the media, and mock trials. Enrollment limited to 18.

A maximum of one 200-level course may count as an elective toward the Spanish major.  
L5

\* **SPAN 223b, Spanish in Film: An Introduction to the New Latin American Cinema**

Margherita Tortora

Development of proficiency in Spanish through analysis of critically acclaimed Latin American films. Includes basic vocabulary of film criticism in Spanish as well as discussion and language exercises. Enrollment limited to 18. A maximum of one 200-level course may count as an elective toward the Spanish major. L5

\* **SPAN 225b, Spanish for the Medical Professions** Mercedes Carreras

Topics in health and welfare. Conversation, reading, and writing about medical issues for advanced Spanish-language students, including those considering careers in medical professions. Enrollment limited to 18. A maximum of one 200-level course may count as an elective toward the Spanish major. L5

\* **SPAN 227a, Creative Writing** María Jordán

An introduction to the craft and practice of creative writing (fiction, poetry, and essays). Focus on the development of writing skills and awareness of a variety of genres and techniques through reading of exemplary works and critical assessment of student work. Emphasis on the ability to write about abstract ideas, sentiments, dreams, and the imaginary world. Enrollment limited to 18. A maximum of one 200-level course may count as an elective toward the Spanish major. L5

\* **SPAN 243a or b, Advanced Spanish Grammar** Staff

A comprehensive, in-depth study of grammar intended to improve students' spoken and written command of Spanish. Linguistic analysis of literary selections; some English-to-Spanish translation. Enrollment limited to 18. A maximum of one 200-level course may count as an elective toward the Spanish major. L5

**SPAN 245b / LAST 245b / PORT 246b, Latin American Film: Brazil, Mexico, and Argentina** Paulo Moreira

An overview of the best cinema produced in Brazil, Mexico, and Argentina; survey of recent films by influential directors from these countries. Comparative discussion of cultures, using the contexts of film production and content. Conducted in English. HU

**SPAN 246b, Introduction to the Cultures of Spain** Noël Valis

Study of various aspects of Spanish culture, including its continuing relation to the societies of Latin America. Examination of Spanish politics, history, religions, art forms, music, and literatures, from ancient times to the present. Primary sources and critical studies are read in the original. L5, HU

[ **SPAN 247, Introduction to the Cultures of Latin America** ]

\* **SPAN 250a, Composition and Analysis** Kevin Poole

Composition in Spanish, with a focus on academic writing. Close analysis of language use in literary texts to improve fluidity and precision in students' own writing. Frequent composition assignments to practice the forms and functions studied. L5, HU

[ **SPAN 261, Studies in Spanish Literature I** ]

[ **SPAN 262, Studies in Spanish Literature II** ]

\* **SPAN 266a / LAST 266a, Studies in Latin American Literature I** Rolena Adorno  
An introduction to Spanish American literature from the Conquest to the nineteenth century. Writings of adventurers, poets, and patriots who won the New World in the sixteenth century, forged new cultural identities in the seventeenth and eighteenth centuries, and fought for independence in the nineteenth century. L5, HU

**SPAN 267b, Studies in Latin American Literature II** Roberto González Echevarría  
An introduction to Latin American literature from the nineteenth century to the present. Works by Borges, García Márquez, Paz, Neruda, Cortázar, and others. L5, HU

\* **SPAN 353a, Spanish American Vanguardist Literature** Aníbal González Perez  
Introduction to the Vanguardist period in Spanish American cultural history. The effects of political and social change in the early twentieth century on Spanish American writers and artists. Tensions between playfulness and engagement, cosmopolitanism and regionalism, and creativity and conscience in Vanguardist works. L5, HU

**SPAN 368b, The Pilgrimage Road to Santiago** Kevin Poole  
A study of the medieval pilgrimage road to Santiago as it exemplified the cultural meanings and material conditions of religious journeys in the late Middle Ages. Examination of literary texts, architecture, art, and music. L5

**SPAN 391a / LITR 283a, Magical Realism** Roberto González Echevarría  
Twentieth-century Latin American novels and short stories in which the fantastic appears. Their derivation from avant-garde trends, the Catholic cultural tradition of miracles, and indigenous and African beliefs. Attention to the relationships between literature and religion and between fiction and visual arts. Conducted in English; a section in Spanish available depending on demand. HU

**SPAN 397b, Renaissance and Baroque Spanish Poetry** Susan Byrne  
Spanish poetry of the sixteenth and seventeenth centuries explored in its historic, intellectual, philosophic, and religious environment. The incorporation of formal elements and imagery from classical mythology, Renaissance humanism, Hermetism, and Neoplatonism. L5, HU

\* **SPAN 478a and SPAN 479b, Directed Readings and/or Individual Research**  
Susan Byrne

Individual study under faculty supervision. The student must submit a bibliography and a written plan of study approved by the faculty adviser to the director of undergraduate studies. No reading or research course credit is granted without prior approval from the director of undergraduate studies. The student must meet with the instructor at least one hour a week. A final examination or essay is required.

\* **SPAN 491a or b, The Senior Essay** Susan Byrne  
A research project completed under faculty supervision and resulting in a paper of considerable length, in Spanish.

## Special Divisional Majors

Director of undergraduate studies: Jasmina Besirevic-Regan, Dean's Office TC,  
432-0722, [jasmina.besirevic@yale.edu](mailto:jasmina.besirevic@yale.edu)

A Special Divisional Major affords an alternative for students whose academic interests cannot be met by an existing departmental or special major. Students may, with the

approval of the Committee on Honors and Academic Standing, design majors of their own in consultation with members of the faculty and in accordance with the procedures outlined below.

Special Divisional Majors differ so widely in content that there is no uniform format, but two patterns prevail. Some majors combine two disciplines (e.g., music and English, religious studies and anthropology), while others draw from several departments to focus on a particular culture, period, or problem (e.g., French studies, medieval studies, urban studies). Students interested in pursuing a Special Divisional Major in Renaissance studies should visit the Renaissance Studies program Web site (<http://www.yale.edu/renstudies/undergrad.html>). A Special Divisional Major may not be offered as one of two majors.

Students considering a Special Divisional Major should be aware of its particular demands and risks. They face the challenges of interdisciplinary work and must grapple with the conceptual processes of disparate disciplines. They must establish criteria for selecting courses and organize their courses in order to obtain an adequate base in the fields necessary for advanced work on a specific topic.

Students in a Special Divisional Major may get little help in designing their programs. Because they are in separate, independent programs, they forfeit some of the services normally provided as part of a departmental or special major. They must, for example, find their own advisers. They need to ask the help of faculty members already committed to other departments and programs who may not share their interdisciplinary interests. They must acquire the necessary background and sustain their interest without the help of any special seminar. They may lose other advantages of departmental affiliation, such as priority for acceptance in restricted-enrollment courses, opportunities to meet students and faculty members with similar interests, and participation in a program easily understood by graduate schools and others. Their transcripts will carry only the notation "Special Divisional Major," without specifying the student's field of concentration.

Before applying for a Special Divisional Major, students are urged to consult the directors of undergraduate studies in their fields of major interest, who can advise them whether a Special Divisional Major is necessary. Special interests can usually be accommodated within an existing major.

**Application** Students considering a Special Divisional Major are invited to talk with directors of undergraduate studies and with their residential college deans at any stage in their planning. Candidates may apply for admission as early as their fourth term of enrollment, but must have done so no later than one month after their seventh term of enrollment begins. The committee's experience suggests that the last term of the sophomore or the first term of the junior year is the best time to apply.

Lucidity, coherence, and completeness in an application are of primary importance to a student's candidacy, since they are indications of a thoughtfully prepared program of study and of the qualities of eagerness and initiative essential to a successful Special Divisional Major. The committee expects that applicants will have worked in close collaboration with the director of undergraduate studies of the Special Divisional Major



in developing their proposals, and it will normally view failure to do so as grounds for rejection of the application.

Application forms are available at the Trumbull College dean's office. They are submitted, along with letters of support from faculty advisers, to the Committee on Honors and Academic Standing in care of the Trumbull College dean's office. The committee meets to consider proposals several times a year. All students in good standing are eligible, although the committee must be satisfied that candidates have particular aptitude and preparation for the work they propose.

In approving or rejecting proposals for a Special Divisional Major, the committee looks principally at the quality of the student's planning. What are the objectives of the program? What are the principles for selecting courses and organizing material? Is the program comparable in breadth and depth to other majors in Yale College? What provisions have been made to guide and evaluate the student's progress? What sort of senior project would focus and integrate the program? Finally, are the objectives of the program best served by a Special Divisional Major? The committee will not approve a major if the student can accomplish the desired aims in an existing major; the committee may consult directors of undergraduate studies and other faculty members to judge whether or not this is the case.

**Requirements of the major** Because of the variety of programs, there are no uniform prerequisites. All students must satisfy their prospective advisers and the committee that they have obtained adequate preparation for the advanced courses and senior projects they propose.

The major ordinarily comprises at least twelve advanced term courses and a senior project. Advanced courses include all but prerequisites for majors, beginning language courses, and comparable courses. When appropriate, approval is granted for graduate courses, tutorials, and residential college seminars. Courses taken Credit/D/Fail may not be counted toward the major. No distinction is made in the Special Divisional Major between standard and intensive majors.

The director of undergraduate studies in the Special Divisional Major presents proposals for the major to the Committee on Honors and Academic Standing. General problems connected with a student's program may be discussed with the director of undergraduate studies. Students who revise their original proposal or change faculty advisers must obtain the committee's approval. The committee advises the Yale College Faculty whether or not the student has completed a major and may not be able to recommend students for the degree who have changed their programs without proper consultation.

**Senior requirement** No later than midterm of their seventh term of enrollment, and after consultation with their faculty advisers, students provide the committee with an outline of their plans for the senior project. There are several options: a written or oral examination, a senior essay or project, or, in some circumstances, a graduate course or a tutorial. A senior essay usually offers the most effective means of integrating material from more than one discipline, and students in a Special Divisional Major typically request one course credit in each term of the senior year in SPEC 491, 492, The Senior Project.

Students who offer a yearlong senior project must, in order to continue the course into the second term, provide their advisers with substantial written evidence of their progress (i.e., a draft or detailed outline) by the end of their seventh term. The project must be completed no later than two weeks before the last day of classes in the student's eighth term of enrollment. At least two faculty members evaluate it.

**Advisers** Candidates must arrange for faculty advisers before applying. Directors of undergraduate studies or department chairs can usually suggest advisers. The committee expects each student to obtain a primary adviser from the department that forms the principal component of the major as well as one or more adjunct advisers from other fields. The primary adviser must be a regular member of the Yale College faculty. Members of the faculties of other schools of the University and visiting faculty members may serve as adjunct advisers.

Both advisers and students assume special responsibilities when designing and completing a major that falls outside existing programs. The special nature of the program and the student's loss of departmental affiliation make it particularly important for the faculty adviser to meet regularly with the student to help plan the program and to supervise its completion, including the senior project.

The primary adviser assumes chief responsibility for reporting the student's progress to the committee and for assigning a grade to the senior project. The primary adviser also consults the student's other advisers and works with them in directing, evaluating, and grading the senior project.

#### REQUIREMENTS OF THE MAJOR

**Prerequisite** Approval of 2 faculty advisers and Committee on Honors and Academic Standing

**Number of courses** 13 term courses (incl one-term senior essay) or 14 term courses (incl two-term senior essay)

**Distribution of courses** Advanced courses in 2 or more appropriate depts; grad courses, college sems, or tutorials with DUS permission

**Senior requirement** Senior essay or project (SPEC 491 and/or 492), or, with DUS permission, written or oral exam, or grad course, or tutorial

## Courses

### \* SPEC 491a and SPEC 492b, The Senior Project Staff

An essay or project, prepared during one or two terms by senior Special Divisional Majors. Conducted under the supervision of the student's primary adviser and with the approval of the Committee on Honors and Academic Standing in connection with an approved Special Divisional Major. Spring-term essays are due no later than two weeks before the last day of classes.

## Statistics

Director of undergraduate studies: Andrew Barron, 24 Hillhouse Ave., 432-0634, [andrew.barron@yale.edu](mailto:andrew.barron@yale.edu); [statistics.yale.edu](http://statistics.yale.edu)

## FACULTY OF THE DEPARTMENT OF STATISTICS

**Professors** † Donald Andrews, Andrew Barron, Joseph Chang, John Hartigan (*Emeritus*), † Theodore Holford, † Peter Phillips, David Pollard, † Heping Zhang, † Hongyu Zhao, Huibin Zhou

**Associate Professors** John Emerson (*Adjunct*), † Sekhar Tatikonda

**Assistant Professors** K. Shuvo Bakar (*Visiting*), Sahand Negahban

**Senior Lecturer** Jonathan Reuning-Scherer

† A joint appointment with primary affiliation in another department or school.

Statistics is the science and art of prediction and explanation. The mathematical foundation of statistics lies in the theory of probability, which is applied to problems of making inferences and decisions under uncertainty. Practical statistical analysis also uses a variety of computational techniques, methods of visualizing and exploring data, methods of seeking and establishing structure and trends in data, and a mode of questioning and reasoning that quantifies uncertainty.

The Statistics program at Yale is a blend of the mathematical theory of probability and statistical inference, the philosophy of inference under uncertainty, computational techniques, the practice of data analysis, and statistical analysis applied to economics, biology, medicine, engineering, and other areas. Statistical methods are widely used in the sciences, medicine, industry, business, and government; graduates can work in these areas or go on to graduate study.

The curriculum for the Statistics major is a synthesis of theory, methods, and applications. The requirements are designed to achieve balance and depth in each of the three directions of probability, statistics, and data analysis. Statistics can be taken either as a primary major or as one of two majors, in consultation with the director of undergraduate studies. Appropriate majors to combine with Statistics include programs in the social sciences, natural sciences, engineering, computer science, or mathematics. A Statistics concentration is also available within the Applied Mathematics major.

**Prerequisites** Multivariable calculus and linear algebra are required and should be taken before or during the sophomore year. This requirement may be satisfied by MATH 120 and MATH 222 or 225, or equivalents.

**Requirements of the major for the B.A. degree program** The program requires ten term courses beyond the prerequisites, including the senior project. Majors take two courses in the theory and applications of probability (STAT 241 and 251), two courses emphasizing the theory of statistical inference (STAT 242 and 312), and two courses in the methods and practice of data analysis, chosen from STAT 230, 361, and 363. STAT 238 may be substituted for STAT 241 with the permission of the director of undergraduate studies. All majors are also required to take a course in computing (ENAS 130 or CPSC 112). The two remaining courses are electives chosen from Statistics courses numbered above 200. Appropriate courses in other departments or in the Graduate School may count toward the major with permission of the director of undergraduate studies.

**Requirements of the major for the B.S. degree program** The program requires twelve term courses beyond the prerequisites. In addition to the courses indicated for the B.A.

degree, the B.S. degree requires a course in mathematical analysis (MATH 260, 300, or 301) and an additional Statistics elective numbered above 200.

**Senior requirement** In the senior year, majors in both degree programs complete a research project in STAT 490. Students enrolled in this course work on a research project under the supervision of a faculty member, present and share their progress with each other during the seminar meetings, and write a final report.

**Credit/D/Fail** For students in the Class of 2017 and subsequent classes, a maximum of one course taken Credit/D/Fail may be counted toward the requirements of the major, with permission of the director of undergraduate studies.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** *Both degrees*—MATH 120 and MATH 222 or 225, or equivalents

**Number of courses** *B.A.*—10 term courses beyond prereqs (incl senior project); *B.S.*—12 term courses beyond prereqs (incl senior project)

**Specific courses required** *B.A.*—STAT 241, 242, 251, 312; 2 from STAT 230, 361, 363; ENAS 130 or CPSC 112; *B.S.*—same, plus MATH 260, 300, or 301

**Distribution of courses** *B.A.*—2 Stat electives numbered above 200, as specified; *B.S.*—3 Stat electives numbered above 200, as specified

**Substitution permitted** STAT 238 for STAT 241, with DUS permission; courses in other depts or grad courses, with DUS permission

**Senior requirement** *Both degrees*—Senior project (STAT 490)

## STAT 101–106, Introduction to Statistics

A basic introduction to statistics, including numerical and graphical summaries of data, probability, hypothesis testing, confidence intervals, and regression. Each course in this group focuses on applications to a particular field of study and is taught jointly by two instructors, one specializing in statistics and the other in the relevant area of application. The first seven weeks of classes are attended by all students in STAT 101–106 together, as general concepts and methods of statistics are developed. The remaining weeks are divided into field-specific sections that develop the concepts with examples and applications. Computers are used for data analysis. These courses are alternatives; they do not form a sequence and only one may be taken for credit. No prerequisites beyond high school algebra. May not be taken after STAT 100 or 109.

Students enrolled in STAT 101–106 who wish to change to STAT 109, or those enrolled in STAT 109 who wish to change to STAT 101–106, must submit a course change notice, signed by the instructor, to their residential college dean by Friday, September 26. The approval of the Committee on Honors and Academic Standing is not required.

### STAT 101a / E&EB 210a, Introduction to Statistics: Life Sciences

Jonathan Reuning-Scherer and Walter Jetz

Statistical and probabilistic analysis of biological problems, presented with a unified foundation in basic statistical theory. Problems are drawn from genetics, ecology, epidemiology, and bioinformatics. QR

**STAT 102a / EP&E 203a / PLSC 452a, Introduction to Statistics: Political Science**

Jonathan Reuning-Scherer and Alan Gerber

Statistical analysis of politics, elections, and political psychology. Problems presented with reference to a wide array of examples: public opinion, campaign finance, racially motivated crime, and public policy. QR

**STAT 103a / EP&E 209a / PLSC 453a, Introduction to Statistics: Social Sciences**

Jonathan Reuning-Scherer

Descriptive and inferential statistics applied to analysis of data from the social sciences. Introduction of concepts and skills for understanding and conducting quantitative research. QR

**STAT 105a, Introduction to Statistics: Medicine** Jonathan Reuning-Scherer and Staff

Statistical methods used in medicine and medical research. Practice in reading medical literature competently and critically, as well as practical experience performing statistical analysis of medical data. QR

## Courses in Statistics

**STAT 100b, Introductory Statistics** Joseph Chang

An introduction to statistical reasoning. Topics include numerical and graphical summaries of data, data acquisition and experimental design, probability, hypothesis testing, confidence intervals, correlation and regression. Application of statistical concepts to data; analysis of real-world problems. May not be taken after STAT 101–106 or 109. QR

EP&amp;E: Intro Statistics

**STAT 109a, Introduction to Statistics: Fundamentals** Jonathan Reuning-Scherer

General concepts and methods in statistics. Meets for the first half of the term only. May not be taken after STAT 100 or 101–106. ½ Course cr

**STAT 230b, Introductory Data Analysis** John Emerson

Survey of statistical methods: plots, transformations, regression, analysis of variance, clustering, principal components, contingency tables, and time series analysis. The R computing language and Web data sources are used. QR

EP&amp;E: Intro Statistics

**STAT 238a, Probability and Statistics** Khandoker Bakar and Joseph Chang

Fundamental principles and techniques of probabilistic thinking, statistical modeling, and data analysis. Essentials of probability, including conditional probability, random variables, distributions, law of large numbers, central limit theorem, and Markov chains. Statistical inference with emphasis on the Bayesian approach: parameter estimation, likelihood, prior and posterior distributions, Bayesian inference using Markov chain Monte Carlo. Introduction to regression and linear models. Computers are used for calculations, simulations, and analysis of data. After MATH 118 or 120. QR

**STAT 241a / MATH 241a, Probability Theory** David Pollard

Introduction to probability theory. Topics include probability spaces, random variables, expectations and probabilities, conditional probability, independence, discrete and continuous distributions, central limit theorem, Markov chains, and probabilistic modeling. After or concurrently with MATH 120 or equivalent. QR

**STAT 242b / MATH 242b, Theory of Statistics** Andrew Barron

Study of the principles of statistical analysis. Topics include maximum likelihood, sampling distributions, estimation, confidence intervals, tests of significance, regression, analysis of variance, and the method of least squares. Some statistical computing. After STAT 241 and concurrently with or after MATH 222 or 225, or equivalents. QR

**STAT 251b / MATH 251b, Stochastic Processes** Sahand Negahban

Introduction to the study of random processes, including Markov chains, Markov random fields, martingales, random walks, Brownian motion, and diffusions. Techniques in probability, such as coupling and large deviations. Applications chosen from image reconstruction, Bayesian statistics, finance, probabilistic analysis of algorithms, and genetics and evolution. After STAT 241 or equivalent. QR

**STAT 312a, Linear Models** Joseph Chang

The geometry of least squares; distribution theory for normal errors; regression, analysis of variance, and designed experiments; numerical algorithms, with particular reference to the R statistical language. After STAT 242 and MATH 222 or 225. QR

**STAT 330b / MATH 330b, Advanced Probability** David Pollard

Measure theoretic probability, conditioning, laws of large numbers, convergence in distribution, characteristic functions, central limit theorems, martingales. Some knowledge of real analysis assumed. QR

**STAT 361a / AMTH 361a, Data Analysis** Khandoker Bakar

Selected topics in statistics explored through analysis of data sets using the R statistical computing language. Topics include linear and nonlinear models, maximum likelihood, resampling methods, curve estimation, model selection, classification, and clustering. Weekly sessions in the Statistical Computing laboratory. After STAT 242 and MATH 222 or 225, or equivalents. QR

**STAT 363b, Multivariate Statistics for Social Sciences** Khandoker Bakar

Introduction to the analysis of multivariate data as applied to examples from the social sciences. Topics include principal components analysis, factor analysis, cluster analysis (hierarchical clustering, k-means), discriminant analysis, multidimensional scaling, and structural equations modeling. Extensive computer work using either SAS or SPSS programming software. Prerequisites: knowledge of basic inferential procedures and experience with linear models. QR

**STAT 364b / AMTH 364b / EENG 454b, Information Theory** Andrew Barron

Foundations of information theory in communications, statistical inference, statistical mechanics, probability, and algorithmic complexity. Quantities of information and their properties: entropy, conditional entropy, divergence, redundancy, mutual information, channel capacity. Basic theorems of data compression, data summarization, and channel coding. Applications in statistics and finance. After STAT 241. QR

**STAT 365b, Data Mining and Machine Learning** Sahand Negahban

Techniques for data mining and machine learning from both statistical and computational perspectives, including support vector machines, bagging, boosting, neural networks, and other nonlinear and nonparametric regression methods. Discussion includes the basic ideas and intuition behind these methods, a more formal

understanding of how and why they work, and opportunities to experiment with machine learning algorithms and to apply them to data. After STAT 242. QR

**\* STAT 480a or b, Individual Studies** Andrew Barron

Directed individual study for qualified students who wish to investigate an area of statistics not covered in regular courses. A student must be sponsored by a faculty member who sets the requirements and meets regularly with the student. Enrollment requires a written plan of study approved by the faculty adviser and the director of undergraduate studies.

**\* STAT 490b, Senior Seminar and Project** Andrew Barron

Under the supervision of a member of the faculty, each student works on an independent project. Students participate in seminar meetings at which they speak on the progress of their projects.

**GRADUATE COURSES OF PARTICULAR INTEREST TO UNDERGRADUATES**

Courses in the Graduate School are open to qualified undergraduates. Descriptions of graduate courses in Statistics are available on the departmental Web site (<http://statistics.yale.edu>). Permission of the instructor and of the director of graduate studies is required.

## Study of the City

### Courses

**\* STCY 176b / ARCH 230b, Introduction to the Study of the City** Alexander Garvin

An examination of forces shaping American cities and strategies for dealing with them. Topics include housing, commercial development, parks, zoning, urban renewal, landmark preservation, new towns, and suburbs. The course includes games, simulated problems, fieldwork, lectures, and discussion. SO

## Theater Studies

Director of undergraduate studies: Dominika Laster, Rm. 102, 220 York St., 432-1310, [dominika.laster@yale.edu](mailto:dominika.laster@yale.edu); [theaterstudies.yale.edu](http://theaterstudies.yale.edu)

**FACULTY ASSOCIATED WITH THE PROGRAM OF THEATER STUDIES**

**Professors** Daphne Brooks (*African American Studies, Theater Studies*), Vasudha Dalmia (*Religious Studies*), Richard Lalli (*Adjunct*) (*Music*), \*Lawrence Manley (*English*), Donald Margulies (*Adjunct*) (*English, Theater Studies*), J. D. McClatchy (*Adjunct*) (*English*), \*Charles Musser (*Film Studies, American Studies, Theater Studies*), \*Joseph Roach (*English, African American Studies, Theater Studies*), \*Marc Robinson (*School of Drama, Theater Studies, English*), Ellen Rosand (*Music*), \*Robert Stepto (*African American Studies, English, American Studies*)

**Associate Professors** \*Toni Dorfman (*Adjunct*) (*Theater Studies*), Gundula Kreuzer (*Music*), Joan MacIntosh (*Adjunct*) (*Theater Studies, School of Drama*), \*Deb Margolin (*Adjunct*) (*Theater Studies*)

**Assistant Professors** Sarah Demers (*Physics*), William Fleming (*Theater Studies, East Asian Languages & Literatures*), Christopher Semk (*French*)

**Lecturers** Jessica Berson, Emily Coates, Lacina Coulibaly, Daniel Egan, Grant Herreid, Annette Jolles, Michael Korie, Dominika Laster, Elise Morrison, Nathan Roberts, Rachel Sheinkin

**Senior Lectors** Krystyna Illakowicz, Bárbara Saffile

\*Member of the Executive Committee for the program.

As a branch of the humanities and as a complex cultural practice, theater claims a rich history and literature and an equally rich repertoire of embodied knowledge and theory. Theater Studies emphasizes the reciprocal relationship between practice and scholarly study. The major combines practical training with theory and history, while stressing creative critical thinking. Students are encouraged to engage intellectual and physical approaches to explore diverse cultural forms, historical traditions, and contemporary life.

The study of theater is interdisciplinary in scope and global in perspective. Students are expected to take courses in cognate disciplines such as history, philosophy, anthropology, political science, film, art, literature, and foreign languages. Faculty members are affiliated with a range of departments; their diverse expertise lends breadth and depth to course offerings and enables students to devise a course of study reflective of their developing interests.

Special features of the program are the production seminars and guided independent study projects. Each production seminar concentrates on study, through practice, of one aspect of work in the theater; examples are approaches to acting, directing, writing, dance, or design. Each seminar involves numerous projects that grow out of the term's work. For example, the project may be production of a play or several plays, adaptation or translation of existing works, or creation of original plays, performance pieces, or set design. Independent study projects give the student freedom to pursue individual and group-generated projects under the guidance of a Theater Studies faculty member. All production seminars require permission of the instructor (by application or audition). Independent study project courses are open only to majors.

**The major** The major consists of ten term courses beyond the introductory prerequisites (THST 110, 111), one of which must be THST 210. Students are encouraged to enroll in a balanced combination of courses involving studio work and courses with literature, history, and theory content. Of the ten required term courses, four must be chosen from four different periods of dramatic literature or theater history or from four different cultures. A suggested scheme might be one course in each of four of the following categories: Shakespeare, African American theater, Greek drama, melodrama, British drama, modern American drama, contemporary American drama, German drama, or other courses in dramatic literature and theater history. At least one of the four courses should include dramatic literature originating in a language other than English. Students are urged to read plays in the original languages whenever possible.

Students are encouraged to choose additional courses to develop the perspectives achieved in the production and literature courses. These courses may be selected (1) as



a study of material that has influenced or provided sources for a playwright or theater; (2) as a study of the historical, political, or religious context of a particular playwright, theater, or literature; (3) as a study of forms of expression contemporary with a particular theater or author, for example, courses in music, art history, architecture, or film; or (4) as a study of theoretical aspects of the theater through courses in such areas as linguistics, aesthetics, psychology, or the history of criticism.

**Credit/D/Fail** For the Class of 2016 and subsequent classes, courses taken Credit/D/Fail may not be counted toward the requirements of the major in Theater Studies.

**Senior requirement** Majors satisfy the senior requirement in one of two ways. They may undertake a one-term senior project (THST 491) or, with the approval of the director of undergraduate studies, they may take one of the dramatic literature or theater history courses as a senior seminar. Senior projects may take the form of directing, designing, or writing a play, performing a role, choreographing a dance piece, or writing a critical essay. Performance-oriented projects are in addition to a senior essay, which is an integral requirement of THST 491. Students wishing to undertake a senior project must submit a proposal before the deadline announced by the director of undergraduate studies. Each proposal is submitted to a faculty committee for approval.

Students interested in mounting a production as part of their senior project are encouraged to develop collaborative proposals among actors, writers, directors, designers, dancers, or dramaturgs. Students proposing a collaborative production project have priority for rehearsal time and production slots in the Whitney Theater Space, 53 Wall Street. Proposals for senior project productions will normally be approved only for students who have previously served as producers of other students' senior projects.

**Courses in the School of Drama** Undergraduates may not enroll in acting or directing courses offered by the School of Drama. Majors in Theater Studies, however, are encouraged to consider taking selected courses in design, dramaturgy, and theater management, with permission of the instructor and the registrar of the School of Drama. For a description of these courses, see the director of undergraduate studies. Meeting times and places are posted in Online Course Information (<http://www.yale.edu/oci>).

Students enrolling in School of Drama courses should note that only four term courses given in the professional schools may be offered toward the bachelor's degree. Permission to count any School of Drama course toward the major in Theater Studies must be obtained from the director of undergraduate studies at the beginning of the term in which the course is taken. Students also should note that the academic calendars of the School of Drama and of Yale College differ. The School of Drama calendar should be consulted for scheduling.

Unless otherwise specified in individual course descriptions, courses in the School of Drama are not open to the Credit/D/Fail option.

#### REQUIREMENTS OF THE MAJOR

**Prerequisites** THST 110, 111

**Number of courses** 10 term courses beyond prereqs (incl senior req)

**Specific course required** THST 210

**Distribution of courses** 4 courses in dramatic lit or theater hist, each from a different period or culture as specified (1 with reading in lit other than English)

**Senior requirement** Senior sem or senior project (THST 491)

## Core Curriculum in Theater Studies

**THST 110a and THST 111b, Survey of Theater and Drama** Staff

An introduction to theater history, plays, aesthetic theories, and performance techniques. From antiquity to the Restoration period in the fall and continuing through to the present in the spring. HU

\* **THST 210a, Introduction to Performance Concepts** Staff

A studio introduction to the basic techniques of acting, including the actor's vocabulary and performance tools. Improvisation, performance exercises, and scene work based on Stanislavsky, Vakhtangov, Michael Chekhov, Strasberg, Adler, Meisner, and Hagen. Admission by audition. Open to Theater Studies majors only. Required for Theater Studies majors in the year immediately following THST 110, 111. RP

## Drama and Dance: History, Theory, Literature

\* **THST 235a / ART 235a, Dance Theater** Emily Coates

A practical and theoretical survey of dance theater history. Introduction to movement vocabularies, physical techniques, and repertoire from post-1950 modern and postmodern dance theater. Open to students of all levels and majors. HU

\* **THST 303a / ENGL 336a / LITR 323a, The Opera Libretto** J. D. McClatchy

A selective survey of the genre from its seventeenth-century Italian origins to the present day. The libretto's history, from *opera seria* to *opéra comique* to melodrama, featuring libretti by Hofmannsthal, W. S. Gilbert, and Auden. Emphasis on literary adaptations, from Da Ponte and Beaumarchais to Britten and Thomas Mann. Source material includes works by Shakespeare, Schiller, Hugo, Melville, and Tennessee Williams. Readings in English; musical background not required. WR, HU

\* **THST 329b / ENGL 361b, Theater Now** Marc Robinson

Study of the drama, performance, and dance theater created in the last ten years, with special attention to work produced in 2014–2015. Readings from both published and unpublished American and British plays, contemporary criticism and theory, interviews, and essays by the artists themselves. Video of works created by companies such as Elevator Repair Service and the Nature Theater of Oklahoma. May include attendance of productions at performance spaces in and around New York City. HU

\* **THST 333b / MUSI 337b, Stephen Sondheim and the American Musical Theater Tradition** Daniel Egan

The musical theater of Stephen Sondheim, both as a popular phenomenon of the contemporary Broadway stage and in relation to models and forms employed in the past. HU RP

\* **THST 355a / AMST 366a / ENGL 419a, Modernism and American Theater**  
Marc Robinson

Examination of modernist principles as they are adapted to, and tested in, American theater. Playwrights include Eugene O'Neill, Gertrude Stein, e. e. cummings, Djuna

Barnes, Mae West, Thornton Wilder, Tennessee Williams, Jane Bowles, and Frank O'Hara.

\* **THST 380b / AMST 370b, The History of Dance** Emily Coates

An examination of major movements in the history of concert and social dance from the late nineteenth century to the present, including ballet, tap, jazz, modern, musical theater, and different cultural forms. Topics include tradition versus innovation, the influence of the African diaspora, and interculturalism. Exercises are used to illuminate analysis of the body in motion. WR, HU

\* **THST 406b / AFAM 428b / AMST 335b, Dance and Black Popular Culture** Staff  
Approaches to theorizing performance, in particular dance performance of a black diaspora. Uncovering methodologies pertinent to the discovery and analysis of dance performance, intersections of black popular culture, and concepts of the corporeal. HU

\* **THST 411a / ENGL 390a / HUMS 169a, Art and the Stage in Britain** Joseph Roach  
The intersection of the fine and performing arts in London and in the British provinces and colonies, from the stage designs of Inigo Jones in the seventeenth century to those of David Hockney in the twentieth and twenty-first. Survey of major styles in stage design, theatrical portraiture, theater architecture, and ephemera. Extensive use of collections in the Yale Center for British Art. WR, HU

\* **THST 416b / ENGL 384b / FILM 461b, British Cinema** Katie Trumpener  
Survey of the British film tradition, emphasizing overlap with literature, drama, and art; visual modernism; documentary's role in defining national identity; "heritage" filmmaking and alternative approaches to tradition; and auteur and actors' cinema.

HU RP

\* **THST 426a / LITR 417a, Maps and the Western Literary Imagination**

Ayesha Ramachandran

The influence of mapping and changing notions of space on literary form, from the cartographic revolution of the sixteenth century to the modern spatial-digital revolution of GPS mapping. Spatial literacy in verbal and visual texts; maps in books and as books; literary uses of mapping practices; recent literary theory on the spatial turn. Works by More, Camões, Montaigne, Voltaire, Pynchon, Walcott, and Chamoiseau. Use of the map collections in Yale's Sterling Memorial and Beinecke libraries. HU

\* **THST 446b, Dance, Commerce, and Capital** Jessica Berson

Dance as a force in the global marketplace. The use of dance to embody unspoken relationships between production and pleasure, consumption and desire. Examination of such relationships through theoretical models drawn from dance and performance studies, cultural studies, marketing, business, and consumer culture studies. How dancing bodies generate a particular performance economy that engages specific strategies of representation, substitution, and identification. HU

\* **THST 455b / MUSI 474b, French Baroque Spectacle** Rebekah Ahrendt

Introduction to the major critical, performance, and historiographical issues associated with French lyric spectacle in the later seventeenth and early eighteenth centuries. Major plays, ballets, and operas by Molière, Corneille, Quinault, with music by Lully, Rameau, Campora, and others. Examination of historic and modern productions; use of original materials from Yale collections. Knowledge of French desirable but not required.

## Playwriting, Production, and Performance

### \* THST 191b / ITAL 152b / LITR 188b, Theater Practicum: Machiavelli

Monica Georgeo

An in-depth study of Machiavelli's *La Mandragola*, culminating in a staged performance of the play in Italian. Major philosophical and political issues raised by the work.

Development of high-level linguistic and communicative skills. Prerequisite: ITAL 150 or permission of the instructor. L5, HU

### \* THST 211b, Intermediate Acting Joan MacIntosh

Continued study of acting as an art, building on performance concepts introduced in THST 210. Various approaches to the actor's task, requiring deeper understanding of conceptual issues and increasing freedom and individuality in building a character. Exercises, monologues, and scene work. Admission by audition. Prerequisite: THST 210. HU RP

### \* THST 224a / MUSI 228a, Musical Theater Performance I Annette Jolles

The structure and meaning of traditional and contemporary musical theater repertoire. Focus on ways to "read" a work, decipher compositional cues for character and action, facilitate internalization of material, and elicit lucid interpretations. For singers, pianists, and directors. Prerequisites: MUSI 211 and 219, or with permission of instructor. Admission by audition only. May be repeated for credit. For audition information e-mail dan.egan@yale.edu. HU RP

### \* THST 226b / MUSI 229b, Musical Theater Performance II Joel Fram

The collaborative process and its effect on musical theater performance. Choreography, music direction, and origination of new works. Analysis of texts, scripts, and taped or filmed performances; applications in students' own performance. May be repeated for credit. For audition information e-mail dan.egan@yale.edu. RP

### \* THST 230b, Advanced Acting and Scene Study Deborah Margolin

Combination of exercises and scene study to deepen the understanding and playing of action. Admission by audition. Open to junior and senior Theater Studies majors only. May be taken more than once. Prerequisite: THST 211. RP

### \* THST 290b / ENGL 388b, Poetics of Performance Justin Sider

Introduction to the oral interpretation of poetry. The expressive principles of social communication and cultural practice as implemented by performance. Experiences of empathy, pathos, and mood; techniques of embodying, projecting, and breathing; modes of analysis, figuration, and interpretation. HU

### \* THST 300a, The Director and the Text I Toni Dorfman

Basic exercises in approaching dramatic or other literary texts from the director's perspective. Particular attention to the many roles and functions of the director in production. Rehearsal and production of workshop scenes. Open to junior and senior Theater Studies majors, and to nonmajors with permission of the instructor. Prerequisite: THST 210. HU RP

### \* THST 318b / MUSI 322b, Analyzing, Directing, and Performing Early Opera

Grant Herreid

Study of a seventeenth-century Venetian opera, with attention to structural analysis of text and music. Exploration of period performance practice, including rhetorical expression, musical style, gesture, dance, Italian elocution, and visual design.

Production of the opera in conjunction with the Yale Baroque Opera Project. Open to all students, but designed especially for singers and directors. Prerequisites: MUSI 211 and 219. Admission by audition only. May be repeated for credit. For audition information e-mail grant.herreid@yale.edu. HU RP

\* **THST 320a / ENGL 453a, Playwriting** Donald Margulies

A seminar and workshop in writing for the stage. Readings include modern American and British plays by Pinter, Mamet, Churchill, Kushner, Williams, and Wilder. Emphasis on play structure, character, and conflict. In addition to weekly exercises, students write a one-act play. RP

\* **THST 321a, Production Seminar: Playwriting** Deborah Margolin

A seminar and workshop in playwriting. Emphasis on developing an individual voice. Scenes read and critiqued in class. Admission by application, with priority to Theater Studies majors. A writing sample and statement of purpose should be submitted to the instructor before the first class meeting. RP

\* **THST 324b, Playwright-Director Laboratory** Toni Dorfman

An exploration of the collaboration between the director and the playwright in the creation of new work. Particular attention to the shaping of dramatic action, structure, and characters. Short scenes are written, staged, critiqued, and revised. Prerequisites: THST 210; for directors: THST 300; for playwrights: THST 320, 321; or with permission of instructor. RP

\* **THST 327b / ENGL 468b, Advanced Playwriting Workshop** Donald Margulies

An intensive workshop in advanced playwriting techniques. Discussion of works by contemporary playwrights. In addition to weekly exercises, students write a full-length play. Prerequisite: an intermediate course in playwriting or screenwriting, or with permission of the instructor. RP

\* **THST 335a / AFST 435a, West African Dance: Traditional to Contemporary**

Lacina Coulibaly

A practical and theoretical study of the traditional dances of Africa, focusing on those of Burkina Faso and their contemporary manifestations. Emphasis on rhythm, kinesthetic form, and gestural expression. The fusion of modern European dance and traditional African dance. Admission by audition during the first class meeting. HU RP

\* **THST 343a, Public Speaking** Elise Morrison

Development of skills in public speaking and in critical analysis of public discourse. Key aspects of rhetoric and cultural communication; techniques for formulating and organizing persuasive arguments, engaging with an audience, and using the voice and body effectively.

\* **THST 376a, Digital Media in Performance** Elise Morrison

Practical and theoretical innovations in contemporary theater and performance brought about by new technologies and forms of information exchange in the late twentieth and early twenty-first centuries. Exploration of how the live body on stage is reconfigured and reimagined through technological intervention. Priority to majors in Theater Studies, in Art, and in Computing and the Arts. Students must preregister during the reading period of the preceding term. HU

**THST 382b, The Company and the Text: Portrait of a Lady** Deborah Margolin  
Techniques used for the creation of devised work in prominent theater companies of the twentieth century. Henry James's *Portrait of a Lady* used as a foundational text for exploring ensemble techniques and devising work collaboratively. Readings from and about works by the Open Theater, the Living Theater, Jerzy Grotowski's Poor Theater, Women's Experimental Theater Company, Mabou Mines, Split Britches, Wooster Group, and Elevator Repair Service. The course culminates in the creation and performance of a piece of devised theater. HU RP

\* **THST 383a, Actor and the Text: The Tempest** Toni Dorfman  
Critical and practical exploration of Shakespeare's *Tempest*, culminating in a public performance. Admission by audition in August. Preference to seniors. HU

\* **THST 395b / ART 389b, Postmodern Dance** Emily Coates  
A studio-based exploration of the epochal shift in choreographic aesthetics known as postmodern dance. The social and historical context in which postmodern dance emerged, including the reconstruction of key dances from the 1960s and 1970s; the evolution of postmodern dance aesthetics into the twenty-first century. HU

\* **THST 402a / ART 386a, Experimental Writing and Performance**  
Dominika Laster and Emily Coates  
A practical and theoretical exploration of the relationship between creative and critical writing and contemporary performance. Includes field trips to the Brooklyn Academy of Music's Next Wave Festival. Admission by application with writing sample. WR, HU

\* **THST 412b, Libretto Writing for Musical Theater** Rachel Sheinkin  
Practical instruction in book writing for musical theater combined with close reading of historical and contemporary examples of the genre. Weekly exercises focus on issues of craft, creativity, and collaboration. RP

\* **THST 414a, Lyric Writing for Musical Theater** Michael Korie  
The craft of lyric writing in musical theater, opera, and crossover works. Both historical models and new composition used as objects of study. Analysis of song form and placement, and of lyric for character, tone, and diction. Creation of lyrics in context. May not be repeated for credit. HU RP

\* **THST 447b / ART 387b / PLSH 447b, Objects in Performance**  
Dominika Laster and Nathan Roberts  
Examination of the meanings and functions of material objects in performance and of the performer-object relation, with attention to historical, theoretical, and practical perspectives. Focus on the work of Tadeusz Kantor, the Polish painter, assemblage artist, set designer, and theater director. Development of a devised theatrical work that culminates in a public performance. Admission by interview or audition. HU

## Special Projects

\* **THST 471a and THST 472b, Directed Independent Study** Dominika Laster  
An independent study should generally conform to the standards and procedures of the senior project, THST 491, even when not undertaken by a senior. If the independent study is a performance or directing project, the adviser visits rehearsals and performances at the mutual convenience of adviser and student. The project must be accompanied by an essay of about fifteen pages, worth about half the final grade.

Although the paper's requirements vary with the project and its adviser, it must be more than a rehearsal log. The paper typically engages interpretative and performance issues as revealed in other productions of the work (if they exist). The writing should be concomitant with rehearsal, to enable each to inform the other, and a draft must be presented to, and commented on by, the adviser at least a week before—not after—the final performance. The final version of the paper, incorporating adjustments and reflections, should be turned in to the adviser no later than ten days after the performance closes, and no later than the first day of the final examination period. An essay project entails substantial reading, at least four meetings with the adviser, and a paper or papers totaling at least twenty pages. A playwriting project normally requires twenty new script pages every two weeks of the term and regular meetings with the adviser. A final draft of the entire script is the culmination of the term's work. Application forms are available from the director of undergraduate studies. Juniors may use one term of these courses to prepare for their senior projects. Open to juniors and seniors. Prerequisites: THST 210 and one seminar.

**\* THST 473a and THST 474b / ENGL 438a and ENGL 439b, Directed Independent Study: Eugene O'Neill Staff**

Individual or small-group study focused on the works of Eugene O'Neill. The course of study is planned by the student under faculty supervision; work may include one or more performances and/or written projects. Open to junior and senior Theater Studies majors, and to nonmajors with permission of the instructor.

**\* THST 491a or b, Senior Project in Theater Studies**

Dominika Laster and Nathan Roberts

Students must submit proposals for senior projects to the Theater Studies office by the deadline announced by the director of undergraduate studies. Attendance at weekly section meetings is required for all students undertaking production projects. Application forms are available in the Theater Studies office, 220 York St.

## Urban Studies

### FACULTY ASSOCIATED WITH URBAN STUDIES

**Professors** Katerina Clark (*Comparative Literature, Slavic Languages & Literatures*), Kathryn Dudley (*Anthropology, American Studies*), Keller Easterling (*School of Architecture*), Dolores Hayden (*School of Architecture, American Studies*), Matthew Jacobson (*History, American Studies*), Jennifer Klein (*History*), Alan Plattus (*School of Architecture*), Douglas Rae (*School of Management, Political Science*), Helen Siu (*Anthropology*), Robert Solomon (*Law School*), Jay Winter (*History*)

**Associate Professor** Michael Rowe (*School of Medicine*)

**Lecturers** Karla Britton (*Architecture*), Gordon Geballe (*Forestry & Environmental Studies*), Jay Gitlin (*History*), Cynthia Horan (*Political Science*), Virginia Jewiss (*Humanities*)

Courses related to urban studies may be found in a number of different departments and programs, particularly American Studies, Anthropology, Architecture, Environmental Studies, History, Humanities, Italian, Political Science, and Sociology.

The course Introduction to the Study of the City is offered each year; details may be found under the heading Study of the City (p. 661).

Urban studies can be incorporated into a number of major programs. The Architecture major includes an urban studies track. American Studies and Ethics, Politics, and Economics majors are required to select an area of concentration, and urban studies meets this requirement. Political Science majors who select the optional interdisciplinary concentration may focus on urban studies. The Political Science department offers the seminar Poverty, Politics, and Policy in the American City (PLSC 280) for qualified students.

Students interested in pursuing a concentration in urban studies within a particular major are encouraged to contact their director of undergraduate studies. Faculty members listed above are available to help students identify appropriate sequences and combinations of courses and may also be willing to meet with students who are writing senior essays on interdisciplinary urban topics.

## Women's, Gender, and Sexuality Studies

Director of undergraduate studies: Joseph Fischel, 311 WLH, 432-1291,  
joseph.fischel@yale.edu; wgss.yale.edu

### FACULTY ASSOCIATED WITH THE PROGRAM OF WOMEN'S, GENDER, AND SEXUALITY STUDIES

**Professors** Julia Adams (*Sociology*), Elizabeth Alexander (*African American Studies*), Carol Armstrong (*History of Art*), Seyla Benhabib (*Political Science, Philosophy*), Hannah Brueckner (*Sociology*), Jill Campbell (*English*), Hazel Carby (*African American Studies, American Studies*), Kang-i Sun Chang (*East Asian Languages & Literatures*), George Chauncey (*History*), Kamari Clarke (*African American Studies, Anthropology*), Deborah Davis (*Sociology, East Asian Studies*), Kathryn Dudley (*Anthropology, American Studies*), Ron Eyerman (*Sociology*), Glenda Gilmore (*History*), Jacqueline Goldsby (*African American Studies, English*), Inderpal Grewal (*American Studies, Anthropology, Women's, Gender, & Sexuality Studies*), Dolores Hayden (*School of Architecture, American Studies*), Margaret Homans (*English, Women's, Gender, & Sexuality Studies*), Marcia Inhorn (*Anthropology, Global Affairs*), Jennifer Klein (*History*), Marianne LaFrance (*Psychology, Women's, Gender, & Sexuality Studies*), Kathryn Lofton (*American Studies, Religious Studies*), Mary Lui (*American Studies, History*), Kobena Mercer (*History of Art, African American Studies*), Joanne Meyerowitz (*American Studies, History*), Priyamvada Natarajan (*Astronomy*), Sally Promey (*American Studies, Institute of Sacred Music*), Frances Rosenbluth (*Political Science*), Alicia Schmidt Camacho (*American Studies*), William Summers (*Molecular Biophysics & Biochemistry*), Michael Warner (*English, American Studies*), Laura Wexler (*American Studies, Women's, Gender, & Sexuality Studies*), Elisabeth Wood (*Political Science*)

**Associate Professors** Jafari Allen (*African American Studies, Anthropology*), Crystal Feimster (*African American Studies*), Moira Fradinger (*Comparative Literature*), Zareena Grewal (*American Studies, Religious Studies*), Janet Henrich (*School of Medicine*), Deb Margolin (*Adjunct*) (*Theater Studies*), Karen Nakamura (*Anthropology, East Asian Studies*), Naomi Rogers (*History of Medicine, History*), Sarah Weiss (*Music*)



**Assistant Professors** Vanessa Agard-Jones (*Women's, Gender, & Sexuality Studies*), Rene Almeling (*Sociology*), Joseph Fischel (*Women's, Gender, & Sexuality Studies*), Greta LaFleur (*American Studies*), Vida Maralani (*Sociology*), Dixia Ramirez (*American Studies*), Birgit Rasmussen (*American Studies*)

**Senior Lecturers** Geetanjali Singh Chanda (*Women's, Gender, & Sexuality Studies*), Kathleen Cleaver (*African American Studies*), Becky Conekin (*History*), Ron Gregg (*Film Studies*), Rebecca Tannenbaum (*History*), Maria Trumpler (*Women's, Gender, & Sexuality Studies*)

**Lecturers** Melanie Boyd (*Women's, Gender, & Sexuality Studies*), Ziv Eisenberg (*History*), George Syrimis (*Hellenic Studies*)

Genders and sexualities are powerful organizing forces: they shape identities and institutions, nations and economies, cultures and political systems. Careful study of gender and sexuality thus explains crucial aspects of our everyday lives on both intimate and global scales. The scholarship in Women's, Gender, and Sexuality Studies is interdisciplinary and wide-ranging, drawing on history, literature, cultural studies, social sciences, and natural science to study genders and sexualities as they intersect with race, ethnicity, class, nationality, transnational processes, disability, and religion.

Students majoring in Women's, Gender, and Sexuality Studies take a series of core courses, develop an individual area of concentration, and write a two-term senior essay. The program encourages work that is interdisciplinary, intersectional, international, and transnational. Individual concentrations evolve along with students' intellectual growth and academic expertise. Recent examples of concentrations include literature and queer aesthetics; transnational feminist practices; the intellectual history of civil rights activism; AIDS health policies; gender, religion, and international NGOs; women's health; food, sexuality, and lesbian community; and gender and sexuality in early education.

**Requirements of the major** Women's, Gender, and Sexuality Studies requires twelve term courses and may be taken either as a primary major or as one of two majors. For students in the Class of 2016 and previous classes, requirements include one gateway course and one intermediate course; for students in the Class of 2017 and subsequent classes, two intermediate courses are required. For all classes, the major also includes one transnational perspectives course, one methodology course, courses in an area of concentration, the junior sequence, and the senior sequence. The area of concentration consists of at least five courses, the majority of which should be drawn from program offerings. Courses for the area of concentration may also fulfill the requirements in transnational perspectives and methodology. Substitutions to the major requirements may be made only with the written permission of the director of undergraduate studies.

**Gateway and intermediate courses for the Class of 2016 and previous classes** The gateway courses (WGSS 110, 111, 115, 120, 200, and 201) offer broad introductions to the fields of women's, gender, and sexuality studies. There are two intermediate courses: Globalizing Gender (WGSS 295) and Introduction to LGBT Studies (WGSS 296). Majors are encouraged to take both but need take only one, preferably after the gateway course and prior to the junior sequence. (WGSS 295 cannot fulfill both the transnational perspectives and the intermediate requirements.)

**Intermediate courses for the Class of 2017 and subsequent classes** There are two intermediate courses: *Bodies and Pleasures, Sex and Genders* (WGSS 205) and *Globalizing Gender and Sexuality* (WGSS 206). Majors are required to take both, preferably prior to the junior sequence.

**Transnational perspectives course** Ideally, each student's course work engages a broad diversity of cultural contexts, ethnicities, and global locations. Such study illuminates the links among nations, states, cultures, regions, and global locations. Most students take several classes that focus on genders and sexualities outside the U.S. context; majors are required to take at least one (not including WGSS 205).

**Methodology course** Given its interdisciplinary nature, Women's, Gender, and Sexuality Studies necessarily relies on a wide range of methodologies: literary criticism, ethnography, visual analysis, historiography, and quantitative data analysis, among others. Each student is expected to acquire competence in at least one methodology relevant to his or her own concentration and planned senior essay. In preparation for the senior essay, students are advised to complete the methods requirement in the junior year.

**Junior sequence** The two-term junior sequence consists of *Feminist and Queer Theory* (WGSS 340) and *Junior Seminar: Theory and Method* (WGSS 398). All students in the major must take both courses. (Individualized alternatives are found for students who study abroad during the junior year.)

**Senior sequence and senior essay** The two-term senior sequence consists of the *Senior Colloquium* (WGSS 490), in which students begin researching and writing a senior essay, followed by the *Senior Essay* (WGSS 491), in which students complete the essay. The senior essay is developed and written under the guidance and supervision of a WGSS-affiliated faculty member with expertise in the area of concentration. Students are expected to meet with their essay advisers on a regular basis.

## REQUIREMENTS OF THE MAJOR

**Prerequisites** None

**Number of courses** 12 term courses (incl senior req)

**Specific courses required** *All classes*—WGSS 340, 398; *Class of 2017 and subsequent classes*—WGSS 205, 206

**Distribution of courses** *All classes*—1 transnational perspectives course; 1 methodology course; 5 electives in area of concentration; *Class of 2016 and previous classes*—1 gateway course and 1 intermediate course, as specified

**Senior requirement** Senior colloq and senior essay (WGSS 490, 491)

## Gateway Courses

**WGSS 120a, Women, Food, and Culture** Maria Trumpler

Interdisciplinary exploration of the gendering of food production, preparation, and consumption in cross-cultural perspective. Topics include agricultural practices, cooking, pasteurization, kitchen technology, food storage, home economics, hunger, anorexia, breast-feeding, meals, and ethnic identity. SO

**WGSS 200a / AMST 135a / HIST 127a, U.S. Lesbian and Gay History**

George Chauncey

Introduction to the social, cultural, and political history of lesbians, gay men, and other socially constituted sexual minorities. Focus on understanding categories of sexuality in relation to shifting normative regimes, primarily in the twentieth century. The emergence of homosexuality and heterosexuality as categories of experience and identity; the changing relationship between homosexuality and transgenderism; the development of diverse lesbian and gay subcultures and their representation in popular culture; religion and sexual science; generational change and everyday life; AIDS; and gay, antigay, feminist, and queer movements. HU

**Intermediate Courses****\* WGSS 205a, Bodies and Pleasures, Sex and Genders** Joseph Fischel

Sexuality explored as an embodied, historical production. Focus on the dynamic, contested relationship between the concepts of gender and sexuality. Investigation of sexuality at the sites of racial difference, psychoanalysis, AIDS, transnationality, U.S. law, publicity, and politics. Ways in which pleasure, power, and inequality are unevenly imbricated. Includes occasional evening screenings. SO

**\* WGSS 206a, Globalizing Gender and Sexuality** Vanessa Agard-Jones

Examination of transnational debates about gender and sexuality as they unfold in specific contexts. Gender as a category that can or cannot travel; feminist critiques of liberal rights paradigms; globalization of particular models of gender/queer advocacy; the role of NGOs in global debates about gender and sexuality.

WR

**Junior Seminars****\* WGSS 340a / ENGL 357a / LITR 426a, Feminist and Queer Theory**

Moira Fradinger

Historical survey of feminist and queer theory from the Enlightenment to the present, with readings from key British, French, and American works. Focus on the foundations and development of contemporary theory. Shared intellectual origins and concepts, as well as divergences and conflicts, among different ways of approaching gender and sexuality. WR, HU

**\* WGSS 398b, Junior Seminar: Theory and Method** Joseph Fischel

An interdisciplinary approach to studying gender and sexuality. Exploration of a range of relevant theoretical frameworks and methodologies. Prepares students for the senior essay. WR, HU, SO

**Senior Courses****\* WGSS 490a or b, The Senior Colloquium** Vanessa Agard-Jones

A research seminar taken during the senior year. Students with diverse research interests and experience discuss common problems and tactics in doing independent research.

**\* WGSS 491a or b, The Senior Essay** Joseph Fischel

Independent research on, and writing of, the senior essay.

## Electives

\* **WGSS 032b, History of Sexuality** Maria Trumpler

Exploration of scientific and medical writings on sexuality over the past century. Focus on the tension between nature and culture in shaping theories, the construction of heterosexuality and homosexuality, the role of scientific studies in moral discourse, and the rise of sexology as a scientific discipline. Enrollment limited to freshmen.

Preregistration required; see under Freshman Seminar Program. WR, HU

**WGSS 110a / ER&M 264a / SOCY 134a, Sex and Gender in Society** Rene Almeling

Introduction to the social processes through which people are categorized in terms of sex and gender, and how these social processes shape individual experiences of the world. Sex and gender in relation to race/ethnicity, class, sexuality, nationality, education, work, family, reproduction, and health. SO

\* **WGSS 204b / ART 202b / HSAR 207b, Feminist Theory and Feminist Art**

Susan Cahan

Major issues in feminist theory and art practice since the 1960s. Topics include women's art of the 1960s and 1970s, performance and body art, representation and the social construction of gender, and the intersection of gender, race, sexuality, and class.

Materials fee: \$25. HU RP

**WGSS 211b / AFAM 140b / AMST 211b / ENGL 293b / ER&M 210b, Race and Gender in American Literature** Birgit Rasmussen

The role of literature in constructing representations of America as an idea, a nation, a colonial settlement, and a participant in world affairs. What kind of place America is and who belongs there; the consequences of America's history for its national literature. Emphasis on the ways texts represent and contest social concepts of race and gender difference. WR, HU

\* **WGSS 215a / ENGL 243a / HUMS 428a / LITR 207a / MGRK 214a, Modern Literature and the Eastern Mediterranean** George Syrimis

The formative influences of Sappho and C. P. Cavafy on the Anglo-American literary tradition from the twentieth century to the present. Nationalism and imperialism, sexuality and aesthetics, biography and art, sapphic verse, the reception of the classical tradition, and the topography of modernity. Writers' fascination with the eastern Mediterranean as an alternative locus for modern Greek, English, and American identities. HU

**WGSS 226b / ARCG 223b / NELC 220b, Lives in Ancient Egypt** Colleen Manassa

Introduction to the social history of ancient Egypt from 3,100 to 30 B.C.E. Focus on the lives of particular individuals attested in the textual and archaeological record, from pharaohs and queens to artists, soldiers, and farmers. Reading of primary sources in translation; course projects integrate ancient objects in Yale collections. HU

\* **WGSS 234b / ANTH 234b, Disability and Culture** Karen Nakamura

Exploration of disability from a cross-cultural perspective, using examples from around the globe. Disability as it relates to identity, culture, law, and politics. Case studies may include deafness in Japan, wheelchair mobility in the United States, and mental illness in the former Soviet republics. SO RP

**WGSS 299b, Sex, Knowledge, and Power** Joseph Fischel and Inderpal Grewal  
 Issues related to sex and gender within and across scholarship on political economy, contract theory, Marxism, socialist feminism, neoliberalism, poststructuralism, development and capability studies, and popular culture. Feminist and critical-theoretical approaches to value, private property, scarcity, accumulation, wealth, and poverty. SO

\* **WGSS 306a / AMST 314a, Gender and Transgender** Greta LaFleur  
 Introduction to transgender studies, an emergent field that draws on gender studies, queer theory, sociology, feminist science studies, literary studies, and history. Representations of gender nonconformity in a cultural context dominated by a two-sex model of human gender differentiation. Sources include novels, autobiographies, films, and philosophy and criticism. RP

\* **WGSS 308b / ANTH 308b, Queer Ethnographies** Karen Nakamura  
 Exploration of both classic and contemporary ethnographies of gender and sexuality. Emphasis on understanding anthropology's contribution to and relationship with gay and lesbian studies and queer theory. SO RP

\* **WGSS 314a / EP&E 267a / SOCY 216a, Social Movements** Ron Eyerman  
 An introduction to sociological perspectives on social movements and collective action, exploring civil rights, student movements, global justice, nationalism, and radical fundamentalism. SO

\* **WGSS 316b / AFAM 273b / SOCY 314b, Inequality in America** Vida Maralani  
 Empirical, theoretical, and methodological issues involved in the study of inequalities in occupation, income, wealth, education, health, and neighborhoods. Intergenerational mobility, marriage and family processes, and inequalities of race, ethnicity, and gender. Questions include whether the United States is a land of opportunity and how different social groups fare and why. WR, SO

\* **WGSS 317b / HUMS 210b / ITAL 317b / LITR 180b / RLST 335b, Women in the Middle Ages** Christiana Purdy Moudarres  
 Medieval understandings of womanhood examined through analysis of writings by and/or about women, from antiquity through the Middle Ages. Introduction to the premodern Western canon and assessment of the role that women played in its construction. TR

\* **WGSS 327a / ER&M 327a / MMES 311a, Constructing the Self: From Autobiography to Facebook** Geetanjali Chanda  
 Autobiography in its evolving form as literary genre, historical archive, and individual and community narrative in a changing geographical context. Women's life stories from Afghanistan, China, Cambodia, Indonesia, India, Iran, Egypt, Jordan, and Vietnam illustrate the dialectic relationship between the global and the local. What the reading and writing of autobiographies reveal about oneself and one's place in society; autobiography as a horizontal community formation. WR, HU

\* **WGSS 328a / ER&M 328a / SAST 458a, Popular Culture and Postcolonial India**  
 Geetanjali Chanda  
 A study of films and literature of South Asians living, working, and directing in Canada, the United Kingdom, and the United States. Questions of commercial populism, authenticity, and postcolonial identity. WR

- \* **WGSS 339b / ENGL 385b, Fiction and Sexual Politics** Margaret Homans  
Historical survey of works of fiction that have shaped and responded to feminist, queer, and transgender thought from the late eighteenth century to the present. Authors include Wollstonecraft, C. Bronte, H. Jacobs, C. P. Gilman, R. Hall, Woolf, Wittig, Walker, Anzaldua, Morrison, Kingston, Winterson, and Bechdel. WR, HU
- \* **WGSS 353b / ENGL 331b, Modernism, Gender, and Sexuality in the Literature of World War I** Margaret Homans  
Fiction, poetry, journalism, and memoirs by U.S. and British writers from World War I and its aftermath, with special attention to the war's effects on gender, on sexuality, and on literary modernism. Topics include trauma, shell shock, memory and memorial art, violence and subjectivity, the relation of the front lines to the home front, and representations of the injured body. WR, HU
- \* **WGSS 361b / SOCY 361b, Demography, Gender, and Health** Vida Maralani  
Comparative survey of research in demography. The interplay of population processes and socioeconomic development; trends in fertility, mortality, aging, and health in both richer and poorer nations; the relationship between women's status and health and demographic outcomes. Readings from a variety of fields, including demography/sociology, economics, epidemiology, and public health. WR, SO
- \* **WGSS 365b / EVST 358b, Gender, Justice, and the Environment**  
Vanessa Agard-Jones  
The intersection between feminist theory and environmental justice. Relationships between gendered beings, both human and nonhuman, and the environments in which they live. Feminist theories of nature and materiality; bodies and environmental toxicities; reproductive rights and population impact; gendered conflicts over the meaning of "sustainable development"; interspecies connections; the sociopolitical contexts of environmental disasters. HU
- \* **WGSS 371b / AMST 322b / ER&M 323b, Modern Families, Identities, and Cultures in Asia and the United States** Geetanjali Chanda  
A cross-cultural dialogue focusing on family, gender, and identity. Exploration of how specific Asian countries and people approach issues of religion, dress, education, and food as identity markers; U.S. perceptions and reactions to similar issues. WR, HU
- \* **WGSS 375b / AMST 375b / FILM 375b, LGBTQ Cinema** Ronald Gregg  
An introduction to queer film history. Focus on LGBTQ representation in Hollywood and experimental film from its beginning to the present, placed in social and political context. Topics include the impact of censorship, codes used to connote homosexuality, and how gay and antigay politics have affected representation. HU
- \* **WGSS 376a / AMST 136a / FILM 444a, Sexual Modernity and Censorship in American Film** Ronald Gregg  
Romantic comedy, censorship, and the representation of sexual modernity in Hollywood film from the 1920s to the 1960s. Tensions between the studios' censorship code and émigré filmmakers' strategies to subvert it. Focus on the romantic comedies of Ernst Lubitsch and Billy Wilder, with some attention to the films of Cecil B. DeMille and Howard Hawks. HU RP

\* **WGSS 380a / AMST 402a / ANTH 302a / FILM 324a, Gender and Sexuality in Media and Popular Culture** Laura Wexler

Investigation of visual media and popular culture in the United States and transnationally. Gender, race, class, and sexuality in relation to the production, circulation, consumption, and reception of media culture. Focus on theories of media and the visual. Significant lab component in which students use media technologies to make and illustrate theoretical arguments. HU

\* **WGSS 388b / AFAM 349b / AMST 326b, Civil Rights and Women's Liberation** Crystal Feimster

The dynamic relationship between the civil rights movement and the women's liberation movement from 1940 to the present. When and how the two movements overlapped, intersected, and diverged. The variety of ways in which African Americans and women campaigned for equal rights. Topics include World War II, freedom summer, black power, the Equal Rights Amendment, feminism, abortion, affirmative action, and gay rights. HU

\* **WGSS 391a / GBLB 391a, Women in Global Affairs** Michele Malvesti

Gender in international relations, with a focus on the roles of women in peace, war, and defense. The effects of armed conflict on women, including characterizations of women as warriors and as victims; perspectives and capabilities that women bring to international negotiations, peace accords, postconflict reconstruction, and the building of civil society; gender and governance, with attention to stereotypes and challenges that female leaders face. SO

\* **WGSS 405a / EALL 211a, Women and Literature in Traditional China** Kang-i Sun Chang

A study of major women writers in traditional China, as well as representations of women by male authors. The power of women's writing; women and material culture; women in exile; courtesans; Taoist and Buddhist nuns; widow poets; cross-dressing women; the female body and its metaphors; footbinding; notions of love and death; the aesthetics of illness; women and revolution; poetry clubs; the function of memory in women's literature; problems of gender and genre. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 201. HU TR

\* **WGSS 410b / AFAM 410b / AMST 310b, Interdisciplinary Approaches to African American Studies** Jafari Allen

An interdisciplinary, thematic approach to the study of race, nation, and ethnicity in the African diaspora. Topics include class, gender, color, and sexuality; the dynamics of reform, Pan-Africanism, neocolonialism, and contemporary black nationalism. Use of a broad range of methodologies. WR, HU, SO

\* **WGSS 411a / AFAM 411a / AMST 426a / ER&M 413a, Fictions of Imaginary and Imminent Futures** Hazel Carby

Ways in which creative artists can imagine and reimagine definitions of the human, through hybridity, crossing the boundaries of species being, contesting ideas of racialized bodies, expanding the possibilities of genders and sexualities, and questioning the relationship between biology, technology, and the body. Focus on an international range of literature, novels, and short stories in the genre of science and speculative fiction, as well as various forms of futurism in visual and sonic culture. HU

\* **WGSS 426a / ENGL 446a, Virginia Woolf** Margaret Homans

A study of the major novels and other writings by Virginia Woolf, with additional readings in historical contexts and in Woolf biography and criticism. Focus on Woolf's modernist formal experimentation and on her responses and contributions to political movements of her day, principally feminism and pacifism; attention also to the critical reception of her work, with emphasis on feminist and queer literary criticism and theory. WR, HU

\* **WGSS 449b / SAST 449b, Fictions of Indian Women** Geetanjali Chanda

An exploration of Indian womanhood through novels and short stories by Indian women. Focus on postindependence women's writings in English in India, and on concepts of nation, home, and identity. WR, HU

\* **WGSS 451a / AMST 449a / HSAR 467a, Photography and Memory: Public and Private Lives** Laura Wexler

The role of photographic representation in archives of public and private memory. The social and expressive functions of photography under the aegis of museums, libraries, art galleries, government, police, and personal albums. Critical theory on gender, race, ethnicity, sexuality, class, and nation as they help construct remembering. HU

\* **WGSS 453a / HIST 142Ja / HSHM 445a, Women and Medicine in America from the Colonial Era to the Present** Naomi Rogers

American women from the colonial era to the present as midwives, patients, healers, reformers, revolutionaries, innovators, and entrepreneurs. Ways that women have shaped American health care and medical research. WR, HU

\* **WGSS 471a or b, Independent Directed Study** Staff

For students who wish to explore an aspect of women's, gender, and sexuality studies not covered by existing courses. The course may be used for research or directed readings and should include one lengthy or several short essays. Students meet with their adviser regularly. To apply for admission, students present a prospectus to the director of undergraduate studies along with a letter of support from the adviser. The prospectus must include a description of the research area, a core bibliography, and the expected sequence and scope of written assignments.



# THE WORK OF YALE UNIVERSITY

The work of Yale University is carried on in the following schools:

**Yale College** Est. 1701. Courses in humanities, social sciences, natural sciences, mathematical and computer sciences, and engineering. Bachelor of Arts (B.A.), Bachelor of Science (B.S.). 203 432-9300 <http://admissions.yale.edu>

**Graduate School of Arts and Sciences** Est. 1847. Courses for college graduates. Master of Advanced Study (M.A.S.), Master of Arts (M.A.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.). 203 432-2771 [www.yale.edu/graduateschool](http://www.yale.edu/graduateschool)

**School of Medicine** Est. 1810. Courses for college graduates and students who have completed requisite training in approved institutions. Doctor of Medicine (M.D.). Postgraduate study in the basic sciences and clinical subjects. Five-year combined program leading to Doctor of Medicine and Master of Health Science (M.D./M.H.S.). Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D./Ph.D.). Master of Medical Science (M.M.Sc.) from the Physician Associate Program. 203 785-2643 <http://medicine.yale.edu/education/admissions>

**Divinity School** Est. 1822. Courses for college graduates. Master of Divinity (M.Div.), Master of Arts in Religion (M.A.R.). Individuals with an M.Div. degree may apply for the program leading to the degree of Master of Sacred Theology (S.T.M.). 203 432-5360 <http://divinity.yale.edu>

**Law School** Est. 1824. Courses for college graduates. Juris Doctor (J.D.). Graduate Programs: Master of Laws (LL.M.), Doctor of the Science of Law (J.S.D.), Master of Studies in Law (M.S.L.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 432-4995 [www.law.yale.edu](http://www.law.yale.edu)

**School of Engineering & Applied Science** Est. 1852. Courses for college graduates. Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 432-4252 <http://seas.yale.edu>

**School of Art** Est. 1869. Professional courses for college and art school graduates. Master of Fine Arts (M.F.A.). 203 432-2600 <http://art.yale.edu>

**School of Music** Est. 1894. Graduate professional studies in performance, composition, and conducting. Certificate in Performance, Master of Music (M.M.), Master of Musical Arts (M.M.A.), Artist Diploma, Doctor of Musical Arts (D.M.A.). 203 432-4155 <http://music.yale.edu>

**School of Forestry & Environmental Studies** Est. 1900. Courses for college graduates. Master of Forestry (M.F.), Master of Forest Science (M.F.S.), Master of Environmental Science (M.E.Sc.), Master of Environmental Management (M.E.M.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 800 825-0330 <http://environment.yale.edu>

**School of Public Health** Est. 1915. Courses for college graduates. Master of Public Health (M.P.H.), Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 785-2844 <http://publichealth.yale.edu>

**School of Architecture** Est. 1916. Courses for college graduates. Professional degree: Master of Architecture (M.Arch.); nonprofessional degree: Master of Environmental Design (M.E.D.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 432-2296 <http://architecture.yale.edu>

**School of Nursing** Est. 1923. Courses for college graduates. Master of Science in Nursing (M.S.N.), Post Master's Certificate, Doctor of Nursing Practice (D.N.P.), Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 785-2389 <http://nursing.yale.edu>

**School of Drama** Est. 1925. Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, One-year Technical Internship (Certificate), Doctor of Fine Arts (D.F.A.). 203 432-1507 <http://drama.yale.edu>

**School of Management** Est. 1976. Courses for college graduates. Master of Business Administration (M.B.A.), Master of Advanced Management (M.A.M.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. <http://som.yale.edu>

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# YALE UNIVERSITY CAMPUS SOUTH & YALE MEDICAL CENTER





The University is committed to basing judgments concerning the admission, education, and employment of individuals upon their qualifications and abilities and affirmatively seeks to attract to its faculty, staff, and student body qualified persons of diverse backgrounds. In accordance with this policy and as delineated by federal and Connecticut law, Yale does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's sex, race, color, religion, age, disability, status as a protected veteran, or national or ethnic origin; nor does Yale discriminate on the basis of sexual orientation or gender identity or expression.

University policy is committed to affirmative action under law in employment of women, minority group members, individuals with disabilities, and protected veterans.

Inquiries concerning these policies may be referred to Valarie Stanley, Director of the Office for Equal Opportunity Programs, 221 Whitney Avenue, 3rd Floor, 203.432.0849. For additional information, see [www.yale.edu/equalopportunity](http://www.yale.edu/equalopportunity).

In accordance with federal and state law, the University maintains information on security policies and procedures and prepares an annual campus security and fire safety report containing three years' worth of campus crime statistics and security policy statements, fire safety information, and a description of where students, faculty, and staff should go to report crimes. The fire safety section of the annual report contains information on current fire safety practices and any fires that occurred within on-campus student housing facilities. Upon request to the Office of the Associate Vice President for Administration, PO Box 208322, 2 Whitney Avenue, Suite 810, New Haven CT 06520-8322, 203.432.8049, the University will provide this information to any applicant for admission, or prospective students and employees may visit <http://publicsafety.yale.edu>.

In accordance with federal law, the University prepares an annual report on participation rates, financial support, and other information regarding men's and women's intercollegiate athletic programs. Upon request to the Director of Athletics, PO Box 208216, New Haven CT 06520-8216, 203.432.1414, the University will provide its annual report to any student or prospective student. The Equity in Athletics Disclosure Act (EADA) report is also available online at <http://ope.ed.gov/athletics>.

*For all other matters related to admission to Yale College, please write to the Office of Undergraduate Admissions, Yale University, PO Box 208234, New Haven CT 06520-8234; telephone, 203.432.9300; Web site, <http://admissions.yale.edu>.*

*Yale University's Web site is [www.yale.edu](http://www.yale.edu); the Yale College Programs of Study is online at <http://catalog.yale.edu/ycps>.*

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