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2017-2018 Undergraduate Bulletin

The City College of New York • 160 Convent Avenue at 138th Street • New York, NY 10031

A Message from the President

Welcome to The City College of New York!

You are beginning an incredible journey toward an excellent education that will prepare you for a successful future in whichever area you choose to study. At CCNY you will be taught by internationally renowned and accomplished faculty in diverse fields, ranging from science, engineering, and architecture to humanities and the arts, education, and social sciences. Recently we opened the new City College Center for Discovery and Innovation and launched the CUNY School of Medicine on our campus in Harlem.

Part of our responsibility as educators and advisors is to awaken your curiosity, expand your knowledge and strengthen skills, provide endless leadership and engagement opportunities, and prepare you for careers that will help you change the world for the better. This is our obligation and our privilege.

To enhance your experience at CCNY, please use this Bulletin to familiarize yourself with our undergraduate majors and areas of specialization. Our rich curriculum offers opportunities to not only chart your own career path, but to explore areas of interest across the fields of science, technology, social justice and the arts. College life outside of the classroom is just as varied and diverse as our student body. Bring your talents and energy to the student government, our varsity and intramural programs, or to one of more than 100 student clubs. CCNY's future starts with you and we want you to find your passion in class, through student activities and as a member of our community.

Use our valuable resources to maximize your City Experience. From innovation and entrepreneurship to cutting-edge research, scholarship and creativity, City College is an institution where education is a vital force for progress in the lives of our students and in our communities.

I look forward to seeing you on the City College campus.

Sincerely,
Vince Boudreau, Interim President

Courses

AES - Architectural Environmental Studies Course Descriptions

Please note that FIQWS or exemption is a prerequisite to all Architecture and AES course except AES 11100 and AES 20100.

AES 11300 - Visual Studies I

Visual Studies I is an introductory course that focuses on the topics of analog and digital drawing and modeling in architectural design. The course emphasizes how the computer can be engaged in architectural design and visualization methods, and introduces students to operative procedures, techniques and technologies for constructing drawings and models that support and promote formal and spatial discoveries. Principles in descriptive geometry will provide the underpinnings for creating visual expressions of shapes and volumes that explore the relationship between analog/digital and two-dimensional/three-dimensional information. The communication of design intent will be established through the understanding of line work, tone, color and other drawing conventions rooted in historical and contemporary modes of architectural representation.

Credits: 2. Contact Hours: 3 hr./wk.

AES 12300 - Visual Studies II

Visual Studies II is a continuation of the introductory Visual Studies course sequence that focuses on the topics of analog and digital drawing and modeling in architectural design. The course emphasizes how the computer can be engaged in architectural design and visualization methods, and introduces students to operative procedures, techniques and technologies for constructing drawings and models that support and promote formal and spatial discoveries. Principles in descriptive geometry will provide the underpinnings for creating visual expressions of shapes and volumes that explore the relationship between analog/digital and two-dimensional/three-dimensional information. The communication of design intent will be established through the understanding of line work, tone, color and other drawing conventions rooted in historical and contemporary modes of architectural representation.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: AES 11300

AES 20100 - Architectural Freehand Drawing

In this course the students are led to see architectural space and to understand and draw the elements that define it. Objects are seen and drawn relative to the greater spaces which they are part of. Line drawing is the principle technique employed in this course.

Credits: 2. Contact Hours: 4 hr./wk.

AES 21200 - The Built Environment of New York City

Exploring the conditions and factors that have led to the development of New York City and its world renowned architecture and open spaces. Field trips, papers and investigation on the creation of New York.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS or exemption

AES 23202 - Survey of World Architecture I

This is the first of a four-semester sequence that examines the physical forms of world architecture and related arts. It analyzes the built environment in response to place, politics, culture, and the people who use it. This semester students will study architecture from the Neolithic period to the 14th century in Europe, Asia, Africa, and the Americas. Two lectures and a recitation section are required weekly.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS or exemption

AES 24001 - Portfolio Review

Review by faculty of the student's design portfolio which is to include work carried out in the 10000 and 20000-level design studios. Criteria include graphic ability, conceptual ability, progress and development. A grade of P is necessary to enter the third year.

Credits: 0. Prerequisite: FIQWS or exemption Corequisite: ARCH 24000

AES 24202 - Survey of World Architecture II

This is the second of a four-semester sequence that examines the physical forms of world architecture and related arts. It analyzes the built environment in response to place, politics, culture, and the people who use it. This semester students will study architecture from the 15th to the 18th centuries in Europe, Asia, Africa, and the Americas. Two lectures and a recitation section are required weekly.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS or exemption

AES 24303 - Elementary Structural Analysis & Behavior

The first of a three-semester sequence focusing on mechanics as an analytical subject, utilizing mathematics, including algebra, trigonometry and geometry. The principles of statics will be covered, with application to statically determinate structures such as beams, trusses and three pin arches, enabling determination of reactions and internal moments. Strength of materials will include the properties of structural sections such as moment of inertia and radius of gyration leading to the calculation of axial, bending, shear stresses and deflections in beams. Approximate methods of analysis are presented for frames, continuous beams and statically indeterminate structures, allowing students to comprehend the broader sense of structural compositions of buildings.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS or exemption. PHYS 21900

ANTH - Anthropology Course Descriptions

ANTH 10100 - General Anthropology

Humankind from its prehistoric beginnings in Africa and its evolution to the present; human nature; cultural bias and fallacies of cultural and racial superiority; society, social groups (ethnic, racial, class, etc.) and social stratification; cultural change and diffusion; the cultural vs. the individual and biological; the interaction among biology, environment, and culture; conflict, culture change, and "modernization"; and ritual, symbol, beliefs, values, customs and language.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 10101 - General Anthropology-Honors

Humankind from its prehistoric beginnings in Africa and its evolution to the present; human nature; cultural bias and fallacies of cultural and racial superiority; society, social groups (ethnic, racial, class, etc.) and social stratification; cultural change and diffusion; the cultural vs. the individual and biological; the interaction among biology, environment, and culture; conflict, culture change and "modernization"; and ritual, symbol, beliefs, values, customs, and language.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 10104 - General Anthropology

Humankind from its beginnings in Africa to the present. This course focuses on human biological and cultural evolution through prehistoric times, identification of cultural bias in attempts to understand the human experience past and present, and exploration of the fallacies of racial and cultural superiority. Topics include the development of social stratification, cultural definitions of reality, language and thought,

alternative ways of generating cooperation and handling conflict, and culture change and "modernization."

Credits: 4. Contact Hours: 4hr/wk

ANTH 13300-13600 - Tutorials in Anthropological Research Laboratory

The Anthropological Research Laboratory offers students an opportunity to do independent research in any of the four fields of anthropology or in applied anthropology, and to have individual advisement in the collection, analysis, and summarizing of data. A project is chosen in cooperation with a faculty member with whom the student meets in one hour conferences each week. In addition the student is expected to devote three hours a week for each credit taken, to be spent in reading and/or data collection, analysis, and writing a report. One or 2 credits of ARL can be taken in conjunction with an Anthropology course in which a student is enrolled, enabling the student to do extra work on a project or term paper connected with that course.

Credits: 1-3. Contact Hours: 1-3 cr. with a maximum of 6 cr. Corequisite: Any other Anthropology or related course. For detailed information contact the Department of Anthropology (NA 7/108).

No more than six credits in any one department and no more than nine credits total will be permitted in the following courses: ANTH 13300-13600, ASIA 20402, BLST 20000-20400, PSY 23300-23600, SOC 23300-23600, UL 22000

ANTH 20000 - Archaeology

The basic aims and methods of archaeological field work and interpretation, with emphasis on the interrelationship of archaeology to general anthropology. Strategies involving the reconstruction of culture, history, past life ways, and processual and post-processual studies will be reviewed against a background survey of world prehistory.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 20100 - Cross-Cultural Perspectives

Human universals and differences in family life, economics, politics and religion in societies around the world. Insights about American life and about how the world's peoples are interdependent. Emphasis on major controversies and issues about gender relations, economic development, inequality, violence and aggression, religion, healing and cultural identity.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 20200 - Languages and Dialects in Cross-Cultural Perspective

A survey of the nature, structure, and social use of languages and dialects. Topics included are sound, word, and sentence structure; multilingualism; speech events and genres; language and education; language and thought, child language acquisition; creole languages; and varieties of Spanish and African-American English.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 20300 - Human Origins

An introduction to human diversity, the relationship of humans to other animals, the fossil record, non-human behavior, genetics and forensics.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 20500 - Historical Archaeology

Archaeological investigations of the modern period. Topics covered include the archaeological method, European colonialism, gender class and ethnicity, the African, Irish, and other diasporas in the Americas.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 20501 - Historical Archaeology Field School

Basic field experience in the creation of a research design, the excavation of selected sites, the recovery and classifying of artifacts, and laboratory analysis. Excavations will be conducted in the New York metropolitan area on local historic sites.

Credits: 5. Contact Hours: 6 hr./wk., lab. and excavation

ANTH 21002 - Writing for the Social Sciences

To develop the skills necessary for writing in the social sciences through the methods and techniques used in Anthropology. The focus of the course is on ethnography (a primarily descriptive account of a single cultural scene). Students will explore the steps used to create an ethnography, including reviewing previous research, formulating hypotheses based on this review, gathering data through fieldwork, and writing a research paper on the results.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 11000.

ANTH 21500 - The Origins of the State

The background and development of urban society in the Old World from the Neolithic period. Life in the early cities of Africa, Asia and the Mediterranean, as revealed by archaeological data. The nature of and reasons for similarities and differences.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 22500 - Class, Ethnicity and Gender

Interrelationship of social organization with economical, political, and religious structures in selected societies chosen to represent various levels of integration in different parts of the world. Modern issues facing increasingly heterogeneous urban societies.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 22600 - Culture, Personality, and Behavior

Anthropological approaches to the study of the interaction between cultural and psychological phenomena in different societies and ethnic groups. Topics include child rearing patterns; perception and logic; socialization patterns and the learning process; formal education and its interface with cultural concepts of class, status, knowledge, and power; maintenance and change of cultural and ethnic identity; adult personality and national character; trance and possession states; mental illness.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 22800 - Anthropology of Urban Areas

Anthropological perspectives on the understanding of the urban experience. Urbanization and urbanism from an international perspective. The forces that shape people's lives in the metropolis. Topics will include the role of ethnicity, race, class, poverty and culture in urban life. Emphasis on urban institutions, ethnicity, race and class in New York City.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 22804 - Urban Anthropology

Anthropological perspectives on the understanding of the urban experience. Urbanization and urbanism from an international perspective. The forces that shape people's lives in the metropolis. Topics will include the role of institutions, landscapes, ethnicity, race, class, poverty, gender, and culture in urban life with an emphasis on New York City. This course is offered as a HYBRID and students must be prepared to use online resources and participate in weekly online discussions.

Credits: 4. Contact Hours: 4hr/wk Prerequisite: IAS 10300 or IAS 10400 or equivalent.

ANTH 22900 - Cultural Change and Modernization

The impact of Western colonial systems on the politics and cultures of the Third World. The growth of new nations and national institutions in Africa, Asia and Latin America.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 23100 - Anthropology of Law

The comparison of legal institutions and practices and of cultural concepts of danger and crime, conformity and conflict, and dispute

management and settlement in non-Western societies and in the urban United States. Topics include law and social change; ordeals and verbal dueling; the relationship of marginal groups and individuals; American family law; and American Indian law.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 23200 - Witchcraft, Magic and Religion

The relationship between social behavior and ideas about supernatural forces. Topics include the origin and role of religion in society; comparison of types of supernatural beings, powers, and religious practitioners; the practice of witchcraft and magic in different societies and ethnic groups; the interpretation of ritual symbols and mythology.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 23600 - Sex, Marriage, and Family in Cross-Cultural Perspective

This course explores how gender and sexuality are iterated, performed, challenged, and managed. Instead of seeing gender and sexuality as coherent and easily quantifiable categories, this class delves into the many contradictions in the categories of gender and sexuality in order to unpack everyday taken for granted assumptions. Furthermore, students will examine how these categories intersect, how they inform each other, and how they gain traction with race, class, and ethnicity.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 24000 - Peoples of Africa

Traditional and modern African cultures viewed on their own terms; African roots of all humanity; the nature of pre-colonial societies; legacy of slavery and colonialism. Special topics include apartheid, African arts and music, African descendants in the Americas, alternate healing systems, and communal religion and trance.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 24000-24700 - Special Area Studies

A group of courses devoted to the study of the cultures and societies of major world areas. Economic patterns, social structures, political organization and religious life. Relation of traditional cultures to contemporary politics.

ANTH 24200 - Peoples of the Caribbean

This course examines the cultural formation of the Caribbean and the diversity of contemporary Caribbean societies. Both the colonial and post-colonial experience of the Afro-Caribbean and the Hispanic Caribbean will be explored. Among the topics to be discussed will be family, religion, rural and urban life, race, color and class, and international migration.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 24300 - Peoples of Latin America

Review of the pre-conquest civilizations of Middle and South America provides a historical basis for considering contemporary cultures and societies of the western hemisphere south of the U.S. border. Varieties of adaptation in horticultural villages of the Amazon, peasant cultivators of highland Andes and Mexico, and urban dwellers will be compared using recent ethnographies. Migration of Hispanics from Latin America to the U.S. will be addressed.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 24600 - Peoples of the Middle East

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 24800 - Field Work Methods in Cultural Anthropology

Firsthand experience with cultural diversity in New York City, with emphasis on direct observation in various neighborhoods and institutional settings. Problems of gathering and analyzing qualitative

and quantitative data, framing research questions, and the ethics of research in culturally unfamiliar settings.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 24900 - Visual Anthropology

Selected world cultures and societies as viewed through the camera lens. Comparisons are drawn between visual and printed records, different styles of filmmaking, and changing cultural patterns. The evolution of anthropology as a discipline. Selected film topics include patterns of work, ritual, the construction of gender roles, and child socialization.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 25400 - American Cultural Patterns

Anthropological perspectives on contemporary United States culture: ethnic and class variations; effect of mass communication on cultural expression; impact of business and commercial enterprise on the development of culture. Critiques of American culture from national and foreign sources.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 25500 - Anthropology of Health and Healing

The cultural and ecological aspects of human disease, the evolution of humanity and its ills, and the study of healing on a cross-cultural basis.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 25504 - Anthropology of Health and Healing

The relationship between health and culture are explored. Rather than focusing on health and illness in terms of biology, students will learn how to analyze the ways in which different societal structures and cultural practices influence these categories. The course will look at medicine through a cross-cultural lens and will present both theoretical material and case studies to illuminate how health, disease, culture, and political-economic power meet up in both national and international settings.

Credits: 4. Contact Hours: 4 hrs./wk.

ANTH 25600 - Women in Cross-Cultural Perspective

Comparative study of women's social roles around the world and through history. The sexual division of labor and evolution of humanity. Family forms and sex roles in hunting-gathering and horticultural society. The forms and origins of patriarchy. Women and family in Third World and industrial nations today.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ANTH 10100, WS 10000, sophomore standing, or instructor's permission.

ANTH 26500 - Language and Society

Various regional and social class dialects are considered along with bilingualism and contact languages such as Haitian French Creole. Focuses on how behavior is affected by value judgments about dialect differences and how language is used to operate in different social contexts, including the classroom, workplace, neighborhood, and in multicultural situations generally.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 27200 - Television & Film: Anthropological Perspectives on the Mass Media

How television and film reflect the sociocultural environment in which they are produced. The emphasis is on the analysis of signs (language, nonverbal communication, and symbolism) in order to understand the ideological context of these media.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 27300 - Black English: Structure and Use

The grammatical structure of Black American English and how it is used in Black culture and the educational system.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 27500 - Creole Sociolinguistics

The origin, history, and grammar of Haitian (French Creole) and related languages such as St. Lucian, Jamaican (Patois), and Guyanese. Topics include the use of Creole in education, Creole orthography, and the relationship of Creole languages to their European language lexifiers.

Credits: 3. Contact Hours: 3 hr./wk., plus conf.

ANTH 28500 - Human Heredity, Race and Intelligence

Environmental, cultural, and genetic interaction in human diversity and evolution. Topics: detecting inherited traits by pedigree, twins, population, chromosome and genetic code methods. Race, intelligence, sex roles, retardation, schizophrenia. Importance of culture and genetics in inherited diseases (sickle-cell trait, lactase deficiency), aggression and war.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 29000 - Dynamics of Human Ecology

Interactions of environmental, cultural, and biological factors in human adaptation. Topics: proxemics, privacy; personal space, territory, crowding, population problems; kinesics (gestures); pollution, food, energy crises, aggression and war causes.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 29500 - Bio-Cultural Anthropology

Environmental, social, nutritional, and political factors in human biological and cultural diversity. Topic areas: nature vs. nurture in sociobiology controversy; deprivation and poverty; stress; sex roles, mental illness, victims and victimization.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 30100-30400 - Honors I-IV

Approval of Dean and department Honors Supervisor required. Apply in NA 4/144 no later than December 10 in the Fall term or May 1 in the Spring term.

Credits: Variable cr. Contact Hours: Variable cr., usually 3 cr./sem.

ANTH 31000 - Independent Study

An opportunity for an individual or small group to develop a research project or explore some topic in depth through directed readings with a faculty member chosen by the student(s). Research project: a problem will be developed (over several semesters, if necessary) leading to the completion of a research paper based on either library or field data. Tutorial: content of readings will be determined by all the participants, and weekly sessions will provide tutorial style discussion. Students are required to make arrangements for each course well in advance of the registration period. Credit may be from 1-3 credits to be determined before registration by the instructor with the approval of the Department Chair. Students may repeat course up to 6 credits.

Credits: 1-3. Contact Hours: 1-3 cr. each course with a maximum of 6 cr. Credits to be determined before registration by the instructor with the approval of the Department Chair. Prerequisite: Junior or senior standing and permission of instructor.

ANTH 31100-32000 - Selected Topics

Departmental and interdepartmental cooperative courses of advanced study in selected subjects.

Credits: 3. Contact Hours: Hrs. and cr. flexible but usually 3 hr./wk. Prerequisite: Junior or senior standing, and permission of the department.

ANTH 32100 - Health Issues and Alternatives

A comparative and holistic study of concepts and practices of wellness and healing in various cultures. The course examines the origins, philosophies and applications of diverse cultures' healing systems to the

prevention and treatment of selected dis-ease conditions. The class will also explore the many alternative modalities now available in this area.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 32200 - Immigrant and Refugee Movements and Cultures

This course covers the main issues, causes and effects of mass population movements. It is a comparative study of selected recent and current immigrant and refugee groups, their origins, cultures and current socioeconomic situations. It covers their strengths, challenges and contributions to their new societies. The realities of particular class, ethnic, gender, generation and political groups will be analyzed. Refugee and immigrant groups within communities of North America and other areas will be studied.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 32300 - Islamic Cultures and Issues

An introduction to basic beliefs, the socio-historical backgrounds of Islamic peoples, current geo-cultural spread, practices/acts of worship, and values and morals. The course examines Islam comparatively: traditional festivals and observances, family and community life, as well as customs and relationships with other communities. Also covered are Islamic contributions, issues, migrations and organizations, and frequent media stereotyping and misrepresentations.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 32400 - Violation of Human Rights

A review of the development of human rights accords and legislation, followed by an examination of international institutions overseeing and enforcing human rights standards. Special attention will be given to media and institutional responses to human rights issues, such as those tied to international, regional, and class injustices, with an emphasis on situations involving women and social minorities/oppressed groups.

Credits: 3. Contact Hours: 3 hr./wk.

ANTH 33000 - Contemporary Culture Theory

The theories underlying the analysis of archaeological and cultural data and differing explanations for cultural regularities: evolutionary, ecological, symbolic, Marxist, structuralist, political, and ethical issues and anthropological theory.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ANTH 20100 and two additional elective courses in Anthropology or instructor's permission.

ANTH 33100 - History of Anthropological Theory

History of the field of Anthropology. Nineteenth century evolutionary theories, and early 20th century historical particularism and structural functionalism. The personality and culture school. Colonialism and politics of anthropological theory.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ANTH 20100 and at least two electives in Anthropology, or instructor's permission.

ANTH 35000 - Race and Racism

An examination of the idea of race from biological, sociocultural, and historical standpoints, particularly as it arose in support of the development of western European colonialism and imperialism. Also investigated will be the role of race/racism via-a-vis socioeconomic inequality, gender, class, ethnicity, and sexuality.

Credits: 3. Contact Hours: 3 hr./wk.

ARAB - Arabic Course Descriptions

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which is numbered 123, 124 and 226.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

ARAB 12300 - Introductory Arabic I

An introductory course in modern standard Arabic (contemporary classical Arabic). Emphasis is on pronunciation of basic everyday vocabulary and simple grammar through conversation and drills based on a situational approach. The reading and writing practice of Arabic script is introduced. Videos are shown to familiarize the students with the language speakers and their culture.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

ARAB 12400 - Introductory Arabic II

A continuation of ARAB 12300 that includes practice and drills in conversation, using basic structural patterns and reading of simple texts constructed for this level and of short suras from the Qu'ran. Videos and discussion of the cultural aspect of Arabic-speaking people are included. All writing is done in Arabic script.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: ARAB 12300 or equivalent.

ARAB 22600 - Intermediate Arabic

An intermediate course that will build on the skills acquired in basic Arabic ARAB 12300 and ARAB 12400 with increased emphasis on reading and writing from modern sources in addition to aural/oral proficiency.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: ARAB 12400 or placement exam.

ARAB 30000 - Advanced Intermediate Arabic

An advanced intermediate level language class focusing on Arabic grammar and writing through a variety of topics, texts and visual media. A continuation and review of grammar, reading, writing and aural-oral skills with added emphasis on spoken competence and fluidity.

Credits: 3. Contact Hours: 3hr/wk.

ARAB 30100 - Selected Topics in Arabic Literatures and Cultures

Introduces students to modern and contemporary issues in Arabic literature and culture, focusing on major trends, themes, and genres. Provides a starting point in the study of Arabic texts. Students are introduced to short stories, novels, essays, poetry, and plays that explore social, religious, and historical aspects of modern and contemporary Arab culture. Uses audio-visual material in order to draw connections between various kinds of media and promote discussion. Taught in English. No prerequisite.

Credits: 3. Contact Hours: 3hr./wk.

ARAB 40100 - Modern Arabic Literatures

Introduces students to modern and contemporary issues in Arabic literature and culture, focusing on major trends, themes, and genres. Although topics may vary from semester to semester, the class aims to provide a starting point in the study of Arabic texts through which students will be introduced to short stories, novels, essays, films, and plays that explore social, religious, and historical aspects of modern and contemporary Arab culture. Taught in Arabic.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: ARAB 30100 or permission of the instructor.

ARCH - Architecture Course Descriptions

ARCH 11100 - Core Studio I

In this introductory studio, students will be introduced to core architectural design competencies in craft, scale, form and dwelling in environments. Format is a sequence of short exercises.

Credits: 4. Contact Hours: 8 hr./wk. Prerequisite: Entry to first year

ARCH 12000 - Core Studio II

In this introductory studio, students will be introduced to core architectural design competencies in craft, scale, form and dwelling in environments. Format is a sequence of short exercises.

Credits: 4. Contact Hours: 8 hr./wk.

ARCH 23000 - Core Studio III

In this studio, students will develop core architectural design competencies in urban systems, history, precedent, and program. The exercises in the course will preview the whole range of his or her activity in the program and as a practicing professional.

Credits: 4. Contact Hours: 8 hr./wk. Prerequisite: FIQWS or exemption

ARCH 24000 - Core Studio IV

In this studio, students will develop core architectural design competencies in urban systems, history, precedent, and program. The exercises in the course will preview the whole range of his or her activity in the program and as a practicing professional.

Credits: 4. Contact Hours: 8 hr./wk.

ARCH 24501 - Construction Technology I

An introduction to building systems, including simple wood and masonry construction. Assemblies of various building components will be studied. Concepts of energy conservation will be related to building construction. In the studio sections students will develop construction drawings of simple building assemblies based on case study analysis.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Entry to fourth semester

ARCH 35101 - Core Studio V

In this core architectural design studio, students engage a range of exercises crucial to the formation of an architect, from developing inspiring and appropriate design concepts to the exploration of building assemblies and materials, and how to integrate this knowledge into design for diverse contexts.

Credits: 5. Contact Hours: 8 hr./wk.

ARCH 35202 - Survey of World Architecture III

This is the third of a four-semester sequence that examines the physical forms of world architecture and related arts. It analyzes the built environment in response to place, politics, culture, and the people who use it. This semester, students will study architecture in the 19th and early 20th centuries in Europe, Asia, Africa, the Americas, and Oceania. Two lectures and a recitation section are required weekly.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS or exemption

ARCH 35302 - Site Technology

A survey workshop in the relationship of physical development to land forms. The student will deal with the basic principles of site planning, environmental and ecological factors of siting, building, grading, drainage, site structures and materials.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Entry to second year. FIQWS or exemption

ARCH 35402 - Introduction to Design of Timber & Masonry Structures

The second course of a three-semester sequence that introduces the design of timber and masonry buildings. Masonry units made of concrete or clay, mortar, grout and reinforcing steel are the primary materials in reinforced masonry and combined with wood framing are a basic structural composition of buildings throughout the world. Students will develop an understanding of the nature and behavior of timber and masonry structures and learn contemporary methods of their design and engineering.

Credits: 3. Contact Hours: 3 hr./wk.

ARCH 35501 - Construction Technology II

This course will concentrate on the technology of medium to high-rise buildings of steel and concrete construction. Case studies of specific buildings will be used to help students expand by analysis their knowledge of a particular group of design applications and appropriate environmental responses of building systems.

Credits: 3. Contact Hours: 3 Prerequisite: Arch 24501 Contact Hours: 3.

ARCH 36101 - Core Studio VI

In this final core architectural design studio, students engage in the integrative design of a building, including detailed documentation. Drawing on knowledge and skills gained in technology courses, they will synthesize structural, mechanical, environmental, and material systems and assemblies into a developed work of architecture.

Credits: 5. Contact Hours: 8 hr./wk. Prerequisite: ARCH 35101. FIQWS or exemption

ARCH 36402 - Introduction to Design of Steel & Concrete Structures

This course, the third of a three-semester sequence, is an introduction to the design of steel and concrete structures. Basic structural analysis of steel and concrete buildings and their components are discussed along with various building analyses and the behavior of structural systems. The methods to design structural members are presented as part of an overall building design which is safe, functional, economical, and aesthetical.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ARCH 35402

ARCH 36501 - Construction Technology III

This course will focus on the performance of buildings relative to environmental impact and operational response. Starting with the building's skin, systems will be understood as being in contact and in manipulated exchange with the thermal, luminous and acoustic environment surrounding them, to serve the ambience and comfort of the interior. Basic knowledge of exchange, distribution and regulation will be related to construction systems. The goal is to integrate structural, mechanical and spatial requirements to make appropriate choices during the design phase.

Credits: 3. Contact Hours: 3 hr./wk Prerequisite: ARCH 35501. FIQWS or exemption

ARCH 41002 - Independent Studies and Research 1

For students in the third and fourth years who wish to pursue advanced study or research in selected topics. Students must obtain written permission from a faculty member who becomes the mentor for the student or students, as to the study plan and the number of credits.

Credits: 2. Prerequisite: Permission of the Department.

ARCH 41003 - Series: Independent Studies and Research 2

For students in the third and fourth years who wish to pursue advanced study or research in selected topics. Students must obtain written permission from a faculty member who becomes the mentor for the student or students, as to the study plan and the number of credits.

Credits: 3. Prerequisite: Permission of the Department.

ARCH 45501 - Computation and Design

Advanced computing course that focuses on the utilization of digital design and fabrication processes in architecture. The course emphasizes how computational tools have evolved and impacted architectural design through methodologies in scripting, simulation, fabrication, and robotics. Students will be introduced to nascent technologies and techniques that encourage and promote computational design thinking. Principles such as algorithmic design, data management, and digital workflows will provide the underpinnings for creating drawings, models, and visualizations.

Credits: 3. Contact Hours: 3 hr./wk.

Advanced computing course that focuses on the utilization of digital design and fabrication processes in architecture. The course emphasizes how computational tools have evolved and impacted architectural design through methodologies in scripting, simulation, fabrication, and robotics. Students will be introduced to nascent technologies and techniques that encourage and promote computational design thinking. Principles such as algorithmic design, data management, and digital workflows will provide the underpinnings for creating drawings, models, and visualizations.

ARCH 47202 - Survey of World Architecture IV

This is the fourth in a four-semester sequence that examines the physical forms of world architecture and related arts. It analyzes the built environment in response to place, politics, culture, and the people who use it. This semester students will study architecture in the 20th and 21st centuries in Europe, Asia, Africa, the Americas, and Oceania.

Credits: 3. Contact Hours: 3 hr./wk. Two lectures and a recitation section are required weekly. Prerequisite: FIQWS or exemption

ARCH 48301 - Construction Technology IV

A well-tempered interior environment is supported by heating, air-conditioning, plumbing, electrical and lighting systems. The approach of this course will focus on the building's core and interior distribution systems, allowing students to understand the building as a regulated environment. Since the artificial support of this environment is based on energy- consumption, the ability to predict and monitor the systems' performance will be used to help make appropriate choices during the design phase.

Credits: 3. Contact Hours: 3

ARCH 51000 - Advanced Studio

Students will be placed in one of an array of diverse advanced studio offerings, developed to provide students opportunity to deeply engage topics within the expansive discipline of architecture, and reflective of the expertise and interests of the full design faculty. Studio project sizes, types and sites will vary, along with pedagogical methods. Course is repeated four times in sequence to meet program requirements. Repeatable up to 3 times.

Credits: 6. Contact Hours: 8 hr./wk. Prerequisite: Entry to 4th year

ARCH 51001 - Independent Study

For Fifth year students who wish to pursue advanced study or research in selected topics. Students must obtain written permission from a faculty member who becomes the mentor for the students or students, as to the study plan and the number of credits. Repeatable.

Credits: 1.

ARCH 51002 - Series: Independent Studies and Research

For fifth year students who wish to pursue advanced study or research in selected topics. Students must obtain written permission from a faculty member who becomes the mentor for the student or students, as to the study plan and the number of credits. Repeatable.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: Permission of the Department.

ARCH 51003 - Series: Independent Studies and Research

For fifth year students who wish to pursue advanced study or research in selected topics. Students must obtain written permission from a faculty member who becomes the mentor for the student or students, as to the study plan and the number of credits. Repeatable.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Permission of the Department.

ARCH 51200 - Architectural Management

The principles of management as applied to the architectural profession. Included in this course are: the general organization of the profession and its relation to client, community, and the construction industry; new management techniques, organization and retrieval; project delivery, construction, and professional documents, cost control, legal surety, contract and financial management.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS or exemption

ARCH 51300 - Selected Topics in Architecture

Special study in topics not covered in the usual department offerings. Topics vary from semester to semester, depending on student and instructor interest.

Credits: 3. Contact Hours: Usually 3 hr./wk. Prerequisite: FIQWS or exemption

ARCH 51316 - Integrated Building Systems

The aim of the course is to introduce state-of-the-art methodologies and tools for integrated design and optimization of energy efficient buildings with a good indoor environment. Focus is on the first part of the design process. The methodology for integrated design is based on listing of the functional requirements of buildings, preparation of space of solutions, generating of design proposals, and optimization analyses and decision processes. The participants will, on individual basis, work on development of the integrated design processes in relation to their own research projects.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MATH 19000 AND ARCH 61100 OR ARCH 61001 OR LAAR 61100 AND ARCH 35201.

ARCH 61301 - Materials/Construction L

An investigation into the systems, techniques, and materials employed in the making of architecture. Focus on case studies in concrete, steel and other construction materials.

Credits: 3. Contact Hours: 3

ARCH 62301 - Materials/Construction S

An investigation into the systems, techniques, and materials employed in the making of architecture. Focus on case studies in wood, masonry, and other construction materials.

Credits: 3. Contact Hours: 3

ART - Art Course Descriptions

ART 10000 - Introduction to the Visual Arts of the World

Concepts underlying content, formal structure, and historical development of the visual arts; art as a global phenomenon from prehistory to the present; relationship of art to the natural world, the built environment, political and other human institutions, and the realm of spirituality.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10001 - Introduction to Art for Honors Students

This course will introduce the students to world art through a study of painting, sculpture, and architecture made in Europe, America, Africa, and Asia. We will analyze a number of key works from prehistoric times to the present day, as we view them in relation to their social and historical content. In addition to the chronological approach, will be the

discussion of a number of questions and issues pertaining to art throughout the ages, including cultural property, gender and culture identity, orientalism, colonialism, primitivism, and postcolonialism.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10004 - Introduction to Principles

Credits: 4. Contact Hours: 4 hr./wk.

ART 10100 - 2-Dimensional Design

Introduction to the principles of two-dimensional concepts to explore visual vocabulary in design. Particular emphasis is made on representational and abstract aspects of composition to describe shape, structure, and space. Other design issues focus on the application of pictorial elements through pattern, texture, rhythm, balance, gravity, line, and the illusion of three-dimensional effects on two-dimensional surfaces. Color principles, the interaction of color, color phenomena, and the function of color in design are closely examined.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10200 - Introduction to Drawing

Drawing emphasizing fundamentals of visual perception, representation, abstraction, and pictorial organization. Introduction to the practice and articulation of elements of drawing involving composition, armature, structure, form, volume, line, texture, value, and space. Observation and specific problems stress experimentation with a variety of drawing materials including dry and aqueous media. Various papers and drawing surfaces are also examined during the course.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10300 - Introduction to Woodcut

This course will explore the fundamentals of woodblock printing. Projects presented in class will introduce students to a wide range of woodblock printing techniques: chiaroscuro, reduction printing, and multi-color printing. Woodblock printing will be discussed in relation to the history of printmaking and its relevance in contemporary art making practices. Students will examine the interrelated nature of form, process, expression, and meaning. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10100 or ART 10200.

ART 10310 - Introduction to Etching/Bookbinding

This course will explore fundamental etching techniques such as hard ground, aquatint and spit bite. Projects presented in class will introduce students to a wide range of mark marking and imagery. Combining different techniques will be emphasized. Some prints will be formatted for traditional and non-traditional books. Bookbinding will be introduced and various techniques will be demonstrated. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10100 or ART 10200.

ART 10320 - Introduction to Lithography

This course will explore the fundamentals of stone and photographic lithography. Projects presented in class will introduce students to a wide range of lithographic techniques: images hand-drawn directly on the stone, multi-color printing, transferred images, and printing from computer-generated outputs. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10200.

ART 10400 - Introduction to Photography

Principles and fundamentals of black and white photography as an art form. Development of film, processing, and printing will be studied. Students will be required to acquire a manual 35mm film camera. Materials fee: \$25.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10410 - Photography and Visual Perception

In this introductory course, students use their digital cameras and the college's lab in a hybrid, hands-on approach to creating work that expresses a personal photographic vocabulary. Students will gain an understanding of the medium by looking analytically at photographs, through critiques, workshops, and demonstrations, as well as in readings and class discussions.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10500 - Introduction to Painting

The medium of oil painting as related to visual perception and composition. Exploration of traditional and non-traditional approaches to painting. Emphasis on materials, color mixing, and technical implications in the process of painting.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10200.

ART 10600 - Introduction to Sculpture

The problems of sculpture as related to visual perception and composition. Materials fee: \$25.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10700 - Introduction to Ceramic Design

Principles of ceramics as an art form, introducing handbuilding methods, such as slab, coil, and pinching to create ceramic forms. Materials fee: \$50.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10710 - Architectural Ceramics

Architectural ceramics is the use of clay to make structural and decorative elements for the built environment. This course is an introduction to basic skills and techniques of ceramics-pinchpot, coil, and slab as taught through the prism of architectural tiles and decorative units. There are field and museum trips to see firsthand the rich multicultural history of ceramic tile and ornament. Provides students with hands-on experience making single and multiple forms. Learn how to make and use plaster press molds, plaster slipcasting molds, and the extruder. Form making, kiln firing, and glazing are covered in this alternate way of exploring the special plastic properties of clay.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10800 - Introduction to Wood Design

This is a course that provides an introduction to design and fabrication with wood as the primary medium. The projects will explore the intrinsic qualities of wood and creative design, from sketch to final form. The goal is to create work that shows a cohesive integration of design, material and execution. The safe use and the proper use of hand and power tools is a vital component of this course.

Credits: 3. Contact Hours: 3 hr./wk.

ART 10900 - 3-Dimensional Design

An introductory course that involves process and problems of creating three-dimensional forms. Concentration on concepts of spatial organization. Particular emphasis on the exploration of various materials, fabrication methods, and techniques using a variety of tools and light machinery. Focus on the formation and analysis of ideas for their interpretation as three-dimensional constructions.

Credits: 3. Contact Hours: 3 hr./wk.

ART 15500 - Introduction to Art Education

An introduction to the field of art education within schools, museums, and community organizations. Integrates studio activities with development of effective teaching strategies.

Credits: 3. Materials Fee: \$20. Contact Hours: 3 hr./wk.

ART 21000 - Writing about Art

Practice in the styles and forms of expository writing required in the arts. Readings that acquaint students with standards of good writing about the arts.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 11000 and ART 10000 or equivalent.

ART 21012 - Egyptian Art and Architecture

Painting, sculpture, architecture, and decorative arts of Egypt from Predynastic times through the Ptolemaic period.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21014 - Greek and Roman Art

Art of the Classical civilizations: Greece from the Geometric period through the Hellenistic era; the Etruscan contribution; Rome from the Republican period through late Imperial times.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21022 - Romanesque and Gothic Art

Art of the later Middle Ages: architecture, sculpture, manuscripts, stained glass; emphasis on French cathedrals, regional schools in emerging national states, and Byzantine influence on the West.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21024 - Italian Renaissance Art and Architecture

An overview of the painting, sculpture, and architecture created in Italy during the fourteenth, fifteenth, and sixteenth centuries. Discussion will focus on the needs and ambitions of private, civic, and ecclesiastical patrons, as well as the creative responses of individual artists from Giotto to Michelangelo.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21025 - Northern Renaissance Art

An overview of painting, sculpture, and printmaking created in Northern Europe during the fourteenth, fifteenth, and sixteenth centuries. Trace the development of naturalism and humanism in France, Germany, and the Netherlands, as well as the dialogue between Northern Europe and Italy during the Renaissance. Discussion will explore the needs and ambitions of private, civic, and ecclesiastical patrons, as well as the creative responses of individual artists from Van Eyck to Bruegel.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21026 - Baroque and Rococo Art in Europe

Seventeenth and eighteenth century art in Italy, France, Spain, and Holland. Artists include Bernini, Poussin, Caravaggio, Artemisia Gentileschi, Velazquez, Rubens, Rembrandt, and Vermeer.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21030 - Nineteenth Century Art in Europe

The art of western Europe, primarily France, including Romanticism, Realism, Impressionism, and Post-Impressionism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21032 - American Art 1776-1900

Art of the United States from colonial times to the late 19th century; consideration of European influences and regional contributions in the development of American architecture, sculpture, and painting. Materials fee: \$20.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21036 - Early 20th-Century Art in Europe and the United States

The development of early modern art styles in France, Germany, Italy, Russia, and the U.S., including Fauvism, Cubism, Futurism, Constructivism, Expressionism, Dada, and Surrealism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21038 - Postwar Art in the U.S. and Europe

Art from 1945 through 1980 in the U.S. and Europe, including Abstract Expressionism, Pop art, Minimal art, Conceptual art, the development of earthworks and public art, feminist and other issue-based art.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21043 - Ancient Art of Meso-America, the Andes, and the Caribbean

A survey of sculpture, architecture, the town plan, and crafts in select pre-European cultures of the Caribbean Basin, the Andes, and Meso-America, including the Taino, the Inca, and the Aztec.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21044 - Art of Native North America

A survey of select artistic traditions of native North American Indian art including Aleut and Inuit. Emphasis on artistic context as a synthesis of regional and cultural-historical phenomena.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21052 - Islamic Art

Architecture and decorative arts of the Islamic world, including Syria, Egypt, Persia, Turkey, Spain, and northern India.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21053 - Art of India and Southeast Asia

Art of India, Southeast Asia, and Indonesia; Buddhist, Jain, and Hindu art in India; Buddhist, and Hindu art in Southeast Asia and Indonesia.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21054 - Art of China, Japan, and Korea

The art and architecture of China, Japan, and Korea from prehistoric times to the nineteenth century.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21062 - History of Art I: Ancient through Medieval

A chronological survey of world art and architecture from prehistoric times through the early Renaissance. Analysis of visual expression in terms of style and content in historical and cultural context.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 11000, ART 10000 and ART 21000.

ART 21064 - History of Art II: Renaissance through Modern

A chronological survey of world art and architecture from the early Renaissance to the present. Analysis of visual expression in terms of style and content in historical and cultural context.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21067 - History of Design

Historical and cultural influences and technical developments in the design of objects for use. Required for the BFA in Electronic Design Multimedia. (Choice of either History of Design or History of Graphic Design.) Materials fee \$10.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21068 - History of Graphic Design

The study of graphic design as a tool for communicating, reinforcing and shaping socially constructed ideals by tracing the role of communication arts from pre-historic to contemporary postmodern aesthetics. (Required for the B.F.A. in Electronic Design Multimedia. (Choice of either History of Design or History of Graphic Design.) Materials fee: \$10.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21069 - Art Criticism

A study of historical and contemporary theories and methodology. Critical analysis and evaluation of original works of art. Student reports, papers, and discussion.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21070 - Topics in "Outsider" Art

This course will examine the work of self-taught or "Outsider" artists in the twentieth and twenty-first centuries, from the emergence of the concept of "Outsider" Art in European Art Brut and its translation into American Art, to current day iterations of such work around the world.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21090 - Research Methods in Art History

Techniques of art historical scholarship; use of bibliographical materials, iconographic and stylistic analyses; oral presentations; writing of a research paper. Required for all students concentrating in art history.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 21510 - Art and Protest

This course offers the opportunity to reflect upon the relationship between art and activism by applying, in students' own creative work, critical tools and methods generated by contemporary theory and social history. While art is often perceived as unrelated to and independent of politics and social history, this course will examine how these underlying contexts affect aesthetics. Many artists have resisted traditional and conventional approaches to art in order to inform us of the existence of other perspectives, histories and voices. Through creative projects and the exposure to other artists' works, readings and films, this course will explore the realities within which images are made. Some of many questions for contemplation and discussion include: What is taste and how is it acquired? Who is responsible for the writing of our history? What is the relationship between money and art history? To what extent do artists simply parrot traditional values in their work? What outlets are available for activist artists? Have alternative aesthetics and radical activities challenged the writing of mainstream representation? How can artists define a political/activist position, and what responsibility do they bear in making images?

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, ART 21000, and at least two studio art courses.

ART 22000 - Intermediate Drawing

Continuation of introductory drawing through exploration of various dry and aqueous media in black and white. Emphasis on formal concerns, drawing devices, process, and expressive drawing to develop a personal visual language. May be taken up to three times for credit.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10200. pre- or co-requisite ART 21000 (or equivalent)

ART 23000 - Projects in Printmaking

Advanced work in various printmaking processes, methods, and techniques. The use of photo, digital, and hand-derived imagery to produce work in photo-silkscreen, photo-lithography, and photo-etching, as well as intaglio, lithography, relief printing, collagraph, silkscreen, and monotype printing. Specific course content will vary semester by semester and be announced beforehand. Materials fee: \$40.

Credits: 3. Contact Hours: This course may be taken as many as four times for credit. 3 hr./wk. Prerequisite: ART 10300, ART 10310, ART 10400 or permission of the instructor. pre- or co-requisite ART 21000 (or equivalent)

ART 24000 - Photography II

Emphasis on the craft of photography. Problems leading to the mastery of technical skills regarding camera usage, exposure, film processing, printing, and finishing. Students will be required to acquire a manual 35mm film camera. Materials fee: \$25.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10400. pre- or co-requisite ART 21000 (or equivalent)

ART 24010 - Color Photography

Practical experience in basic techniques as well as exploration of creative directions in the field of color photography. Materials fee: \$25.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10400. pre- or co-requisite ART 21000 (or equivalent)

ART 24020 - Photojournalism

The making of still photographs for use in visual communications media. The function, scope, and influence of photojournalism in contemporary society.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10400 or ART 10410. pre- or co-requisite ART 21000 (or equivalent)

ART 24030 - Documentary Photography

Visual recording, by means of still photographs, of people and the products of their society. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10400 or ART 10410. pre- or co-requisite ART 21000 (or equivalent)

ART 24050 - Genres in Photography

A project based course exploring current issues and working methods in contemporary fine-art photography. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 24000 or ART 24010 or ART 29530. pre- or co-requisite ART 21000 (or equivalent)

ART 25000 - Projects in Painting

Exploration of problems in painting in representational and nonrepresentational approaches. Emphasis on painting from direct observation, personal concepts, and solutions to assigned projects. The course focuses on formal concerns including color mixing, value, color interaction, composition, and problems of pictorial space. Studies and medium-size paintings will investigate the overlapping relationships of painting and drawing. Experimentation with materials, techniques, and various alternatives in the handling of paint.

Credits: 3. Contact Hours: This course may be taken up to 4 times for credit. 3 hr./wk. Prerequisite: ART 10500. pre- or co-requisite ART 21000 (or equivalent)

ART 25500 - Identity and Culture in Art Education

A studio-based art education course exploring how art connects to concepts of identity and culture. Includes studio art, writing, and practical teaching experiences related to museums, schools, and communities. Integrates studio activities with development of effective teaching strategies. Materials fee: \$20.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 15500

ART 26000 - Projects in Sculpture

The principles of visual communication and expression in sculpture. The sculptural idea will be taken through the necessary paces from doodle to final presentation. The course aims to provide an environment that encourages students to explore these ideas through research, process, and materials. The students will be exposed to historical and contemporary precedence in art making and are taught to think independently to gain an understanding of a wide range of sculptural concerns. The course will revolve around traditional and contemporary methods of fabrication, such as welding, carving, and construction, as well as the use of alternative materials, such as concrete, polystyrene, etc. Materials fee: \$25.

Credits: 3. Contact Hours: This course may be taken as many as 4 times for credit. 3 hr./wk. Prerequisite: ART 10600. pre- or co-requisite ART 21000 (or equivalent)

ART 27000 - Projects in Ceramic Design

A course that introduces throwing on the potter's wheel, glazing, and kiln firing. Slide presentations, films, demonstrations, and critiques, with emphasis on individual projects and the development of a personal approach to clay. Students are expected to participate in kiln loading and firing of their work. Materials fee: \$50.

Credits: 3. Contact Hours: This course may be taken as many as 4 times for credit. 3 hr./wk. Prerequisite: ART 10700. pre- or co-requisite ART 21000 (or equivalent)

ART 27100 - Greek And Roman Art

Art of the Classical civilizations: Greece from the Geometric period through the Hellenistic era; the Etruscan contribution: Rome from the Republican period through late Imperial times.

Credits: 3. Contact Hours: 3

ART 28000 - Projects in Wood Design

Continuation of Introduction to Wood Design. Emphasis on development and construction of more sophisticated designs. Advanced woodworking techniques.

Credits: 3. Contact Hours: This course may be taken as many as 4 times for credit. 3 hr./wk. Prerequisite: ART 10800. pre- or co-requisite ART 21000 (or equivalent)

ART 28500 - Art: China-Jap-Korea

The art and architecture of China, Japan, and Korea from prehistoric times to the nineteenth century.

Credits: 3. Contact Hours: 3

ART 28604 - History, Aesthetics and Criticism of Still Photography

The aesthetic, historical and technical development of still photography viewed as a major medium of artistic expression in the 19th and 20th Centuries are examined.

Credits: 4. Contact Hours: 4hr/wk

ART 29104 - Women in World Art

Women in World Art will examine the key issues, artists, and historical periods beginning in prehistory, through the middle ages when women first emerged as artists, and on to the contemporary art scene. Students will explore the imaging of women in art as subject and women as creators of art, the political climates that excluded women from art production, and women artists' struggles for recognition and equality as they have achieved a foothold in the art world.

Credits: 4. Contact Hours: 4hr/wk

ART 29500 - Typography I

Type as abstract structure and its relation to problems of graphic communication. Application of typographic design in the creation of

posters, brochures, magazine and book design, print ads and packaging. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10100. pre- or co-requisite ART 21000 (or equivalent)

ART 29510 - Graphic Design Concepts

Exploring the relationship of image and type in graphic design, with emphasis on developing conceptual and visualization skills. Design and imaging using traditional tools and technology in projects ranging from the development of graphic icons to the design of promotional materials. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10100. pre- or co-requisite ART 21000 (or equivalent)

ART 29520 - Illustration

Aspects of contemporary illustration in various media. Projects in editorial (book, magazine), advertising (product, technical), and promotional (poster) illustration. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or coreq.: ART 10100 or ART 10200. ART 21000 (or equivalent)

ART 29526 - 2-D Imaging and Illustration

Electronic illustration and image processing with an overview of approaches from painting to montage. Exploring imaging techniques through the use of masks, channels, filters, and special effects. Issues of color management, color correction, resolution, and printing. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10100 and ART 29520. pre- or co-requisite ART 21000 (or equivalent)

ART 29530 - Digital Photography I

Introduction to digital photographic practices. Technical concerns and aesthetic issues of digital image capture and digital photo manipulation and output/display. Exploration of contemporary digital photography and student concept development through the digital photographic process. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10400 or ART 10410. pre-or co-requisite ART 21000 (or equivalent)

ART 31011-31020 - Selected Topics in Art History

Advanced study in selected subjects outside of the regular curriculum. Course announcements will be made in the preceding semester.

ART 31012 - Arts of Africa: An Introduction

Artists from Africa and African diasporas have historically created vibrant and diverse arts that shape and are shaped by local and global politics as well as social and religious experiences. In this introductory course, students examine a broad range of arts and cultures linked to the continent and consider how arts and artistic practices move. To understand how knowledge about African arts has formed and changed, students investigate categories used to classify African arts and ways people have studied such arts.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31013 - Contemporary Arts of Africa

Artists linked to Africa increasingly resist framing their work according to ethnic or national identities. Yet, the construction of cultural and national histories often contributes to the content and reception of artists' projects. In this course, we consider how colonial, postcolonial, transnational, and international experiences intersect with arts created from diverse mediums. We also investigate the classifications contemporary, African, and contemporary "African" in relationship to artistic production, promotion, and display.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31038 - Art Since 1980

This course explores art since 1980 both in a historical context and in terms of contemporary criticism. Frequent gallery visits and conversations with artists, curators, gallery assistants.

Credits: 3. Contact Hours: 3

ART 31094-31096 - Honors I-III in Art History

Approval of Dean and Department Honors Supervisor required. Apply in NA 5/225 no later than December 10 in the fall term or May 1 in the spring term.

Contact Hours: Usually 3 cr./sem.

ART 31098 - Internship in Art History

Credit is available to art history students for internships and fieldwork in cooperation with commercial and industrial firms, museums, galleries, and governmental agencies. May be taken up to 2 times for credit.

Credits: 3.

ART 31099 - Independent Study in Art History

Individual research in selected problems under faculty guidance. Advance application and permission of instructor and chair required for admission.

Credits: 3. Contact Hours: May not be taken more than 3 times.

ART 31106 - Issues of Identity in Modern Art

This course will explore identity issues in modern art with an emphasis on contemporary art. We will consider a range of questions, including how to identify and define identity, orientalism and the "other," cultural aesthetics, diaspora, dislocation, hybridity and multiculturalism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31110 - Asian Art Since 1900

Credits: 3. Contact Hours: 3

ART 31114 - Topics in Folk Art

Credits: 3. Contact Hours: 3

ART 31115 - Public Art in the U.S.

This course presents a historical overview of public art in the United States, focusing on key paradigms: memorials, non-commemorative sculpture, landscape or urban design projects, and social interventions. It includes class visits to major public art commissioning agencies such as Percent for Art (Department of Cultural Affairs), MTA Arts for Transit and Creative Time. Requirements consist of take-home midterm and final exams, several short writing assignments, weekly classroom group discussions and presentations.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31118 - Themes and Methods of African Arts

Dynamic sculptures, textiles, masquerades, assemblages, photography, and architecture made from a variety of materials constitute some of the arts that diverse artists from across West Africa have historically produced. Using a thematic approach, students examine a range of arts linked to the continent and investigate similarities and differences in strategies of artistic production. Students also consider different methods scholars have developed to understand such arts.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31501-31510 - Selected Topics in Studio Art

Advanced study in selected subjects outside of the regular curriculum. Course announcements will be made in the preceding semester.

Credits: 3. Contact Hours: 3 hr./wk.

ART 31530 - Modern Art in Latin America

An overview of the various currents of modernism that developed in Latin America from 1900 to 1945. Emphasis will be placed on the artistic production of certain countries, such as Mexico, Brazil, Argentina, Cuba, and Uruguay.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31531 - Modern Mexican Art

This undergraduate course is an in-depth look at the period known as the "Mexican Renaissance" when numerous artists, intellectuals, and government institutions responded to the goals, proposals, and failures of the Mexican Revolution (1910-1920), the first social uprising of the twentieth century. It will provide an overview of Mexican muralism and consider the role of diverse media (easel painting, graphic art, and photography) in expressing issues such as cultural nationalism, gender, class, and race in post-Revolutionary Mexican society. The course is organized as a series of classroom lectures based on slides and selected thematic and chronological topics. A field trip to the Orozco mural at the New School and/or a local museum and/or gallery will provide students with first-hand knowledge of the art under discussion.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31532 - Contemporary Art in Latin America

Artistic manifestations in post-World War II Latin America, including the work of diaspora artists and Latino/a artists in the United States.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31534 - History of Photography

The aesthetic, historical, and technical development of still photography viewed as a major medium of artistic expression in the nineteenth and twentieth centuries.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31538 - Art Since 1980

This course explores art since 1980 both in a historical context and in terms of contemporary criticism. Frequent gallery visits and conversations with artists, curators, gallery assistants.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31550 - The Artist in Society: South Asian Perspectives

This course challenges students to think about how concepts of the artist develop in historically and culturally specific ways, and to consider how such concepts influence visual traditions. It focuses on the painters, sculptors, architects and craftspeople of South Asia. Major themes include concepts of art, artist/patron relationships, workshop practices, techniques and materials, tradition and innovation, and differing historical and cultural perceptions of artists. All periods of South Asian art history are covered, but the emphasis is on the 16th to 19th centuries.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000; Co-req: ART 21000.

ART 31553 - Asian Art Since 1850: Tradition and Nation

This course looks at ideas of tradition and nation in modern and contemporary Asian arts, at rejections of these ideas and at the struggle of individuals to escape the confines of nationalist thinking and East/West dichotomies. The course will focus primarily on India and Japan, respectively colonized and colonizing nations, but Pakistan, Korea and China are also discussed.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31570 - "Outsider" Art Environments

This course will explore 20th and 21st-century "outsider" art environments: vernacular expressions of art, architecture, and/or landscape architecture, which emerge as public and private expressions by artists/builders who do not have formal training, and which are generally grounded in the local concerns and experiences of their makers.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10000, Pre- or Coreq: ART 21000 (or equivalent)

ART 31591-31593 - Honors I-III in Studio Art

ART 32000 - Figure Drawing

Drawing from the live model as a means to understand line, shape, form, proportion, and foreshortening in the figure. Emphasis on principles of anatomy to examine bone structure and muscles. Drawing the figure includes both short poses to investigate gesture and the dynamics of the pose, and long poses with focus on creating a finished drawing by incorporating light, space and, compositional devices. Experimentation with various dry and wet drawing techniques.

Credits: 3. Contact Hours: This course may be taken as many as 4 times for credit. 3 hr./wk. Prerequisite: ART 10200.

ART 32098-39598 - Internships and Fieldwork

Credit is available to advanced students for internships and fieldwork in cooperation with commercial and industrial firms, museums and galleries, and governmental agencies. Students can register for specialized internships based on the area of study. Permission of instructor and chair required.

Contact Hours: 3 cr. each. No more than 6 credits accepted.

ART 32099-39599 - Independent Study in Studio Art

Independent study in art under staff guidance. Three previous courses (or equivalent) in area of study chosen and permission of instructor and Chair required for admission.

Credits: 3. Contact Hours: 3 cr. each. No more than 9 cr. accepted.

ART 34000 - Photo Portfolio and Projects

Advanced and individualized projects in any area of photography. Portfolio development for students specializing in photography. Group and individual critiques and reviews, as well as readings and discussions to develop and hone one's artistic vision, and to promote passionate and sustained involvement in photography as a communication medium of personal, social and cultural significance. Materials fee: \$40.

Credits: 3. Contact Hours: This course may be taken as many as 4 times for credit. 3 hr./wk. Prerequisite: ART 24000 or ART 24010 or ART 29530.

ART 34040 - Alternative Processes in Photography

Introduction to unconventional photographic processes. Exploration of historic and new methods and materials that allow extension of photographic imagery beyond the standard black and white silverprint. Experimentation with hand-made emulsions and papers, incorporation of photographic imagery into new and varied contexts, such as drawings, paintings, and books. Material's fee: \$40

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 24000 or ART 24010.

ART 34060 - Studio Photography and Lighting

Emphasis on developing a studio sensibility. Exploration of various lighting systems such as tungsten and quartz, studio and portable flash, natural light, and mixed sources. We will address the artistic and technical problems associated with portraiture, still life, and product photography. Use of hand-held meters, flash meters, lighting

accessories, filters, and an introduction to the view camera. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 24000, or ART 24010 or ART 29530.

ART 34070 - Large Format Photography

An introduction to the large format view camera as used in fine art and commercial photography. A studio course covering fundamental camera movements, perspective controls and optics selection, applied lighting set-ups, metering and exposure calculation procedures, and specialized film processing and printing skills. Students will get hands-on experience with the 4x5 inch camera, while fostering a studio sensibility through the development of skills and techniques unique to large format photography. The course will introduce students to another way of seeing by exploring the special properties inherent in large format, while working in a professional, studio environment. Materials fee: \$35.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 24000.

ART 35000 - Watercolor

Continued experience with aqueous media, both transparent and opaque, including applications to other areas of artistic expression. Materials fee: \$20.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 10100.

ART 36600 - Furniture Design

Principles of furniture design, ergonomics, and methods of research, design, and planning are examined in contemporary concepts, both classical and experimental. The process of design and fabrication is stressed through understanding of materials, technologies, and construction.

Credits: 3. Contact Hours: 3 hr./wk.

ART 37000 - Clay and Glazes

The study of the raw materials used in the ceramic process to formulate clay bodies and glazes. A lecture and laboratory course which will give students the basic knowledge necessary to mix their own glazes and clay bodies. Materials fee: \$25.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 27000

ART 39500 - Typography II

A continuation of Typography I. This course will focus more closely on the expert usage of type in all forms of graphic design. Students will learn to create powerful graphic statements using the diverse properties of typographic expression. Emphasis on communication systems, cohesive identity packages, logo development and publication design with orderly, logical and aesthetically appropriate typographic usage. Various projects will explore enhancing comprehension through intelligent use of typographic levels of emphasis. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 29500.

ART 39510 - Electronic Design I

Design for print media with special focus on page layout, integration of text and graphic illustration, and corporate identity systems. Use of the computer as a design and production tool, with an introduction to vector and raster-based software for design and illustration. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 29500 and ART 29510.

ART 39512 - Print Production

Investigation of print production for graphic design, from concept to execution. Development of concepts from initial visualization to comprehensive mechanicals for black and white and color printing. Exploration of systems for page layout (such as the grid system) and other approaches to the design of visual information. Overview of special techniques in printing including embossing, die-cuts and paper selection. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 39510.

ART 39520 - Illustration 2

A continuation of Illustration I, emphasis is placed on personal style, portfolio development, taking a concept from start to finished illustration, and exploration of historical and contemporary Illustration styles. In addition to projects, students will engage in critiques, gallery and studio visits, and with speakers presenting creative and commercial illustration projects. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or coreq: ART 29520.

ART ART 39522 - Vector Illustration

Builds upon students' basic Adobe Illustrator skills to develop complex vector graphic images. Through demonstrations, exercises, and project assignments, students apply visual problem solving skills to projects in logo & brand design; graphic icons; character design and caricature; dynamic lettering; 3-D illustration; and pattern design among other topics. Prereq: ART 39510 or Departmental Permission.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or departmental permission.

ART 39528 - 2-D Animation Principles

Introduction to the basic principles, techniques, and processes involved in the development of 2D animation. The course focuses on exercises and projects that explore the classical principles of animation as applied in a digital environment. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 29526 or ART 29530.

ART 39530 - Digital Photography II

This course builds on the concepts and skills learned in ART 29530. A further examination of conceptual and technical concerns surrounding digital photography. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 29530.

ART 39540 - Design for the World Wide Web I

Interface design, information structuring and interactivity for the World Wide Web. Sites will be examined from the perspective of design, utility and interactivity. Development of HTML documents and images, design and prototype testing of a logical hierarchical information structure. Students will work individually and in teams, and develop an actual site. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 29500 and ART 29526.

ART 39542 - Web Animation

This course explores tools and techniques for animation and the design of interactive experience for the Web. Exploration of traditional animation techniques (frame-by-frame animation and tweening) and the development of code-based animation and interactivity. Projects in visual communication for the Web incorporating text, audio, and moving images controlled via Actionscript. Materials fee: \$40

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 39540.

ART 39552 - Programming for Artists

Introduction to the basic concepts of computer programming for visual artists including variables, functions, and data structures through projects dealing with image processing, animation, and text manipulation. The course assumes no prior programming knowledge and presents the concepts in a manner that is accessible to everyone. Development of problem solving skills is emphasized. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 29526 or ART 29530.

ART 39560 - Digital Video I

This course provides an introduction to digital motion graphics and desktop video on the Macintosh. We will survey a variety of imaging techniques through the history of video as an art form, and learn how to apply these modes of visual thinking to our own projects. This course will provide practical experience in design and production of Quicktime-based digital video and motion graphics using a variety of software, especially Adobe After Effects. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 29526 or ART 29530.

ART 39568 - Concept Research

This class is recommended for all BFA students who want to prepare for their final thesis or other independent projects. This course examines the creation of an individual project through concepts, research, experimentation, and exercises. Through readings, discussions and field trips, students will learn to come up with a strong idea and to formulate an argument for it.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Permission of instructor. Permission will be based on instructor's evaluation of student's course work to date, and submission of a brief proposal (100-200 words) that articulates the student's creative research interest. Students from other majors who wish to develop a creative research project are invited to apply.

ART 39570 - 3-Dimensional Computer Imaging and Animation I: Foundation

This course provides students with a solid foundation in both the creative and technical aspects of 3-Dimensional image creation on the computer. Topics include 3-Dimensional modeling, animating, lighting, shading, texturing, camera composition and rendering techniques. Both still image and animation will be covered. In addition to discussing a range of 3-Dimensional software programs, this course will explore the role of 2-Dimensional drawing and painting programs in the creation of 3-Dimensional image environments. The role of 3-Dimensional imaging in film, design, multimedia art, and electronic gaming will also be discussed. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 29526.

ART 39580 - Game Workshop

This course teaches the fundamentals of game play design. Students are introduced to a variety of games and work individually and collaboratively to create new board and card games. The class emphasizes an iterative design process.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 21000 or other 200-level writing course.

ART 39590 - Critical Issues in Design, Technology and New Media

Seminar exploring the visual language of image and typography and its function in mass communications; the syntax of video, audio and interactive works; and the aesthetic and social challenges raised in design for print, time-based media and telecommunications. The seminar will provide students with a thorough grounding in technology-related issues through selected readings and discussion. Materials fee: \$10

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 21067 or ART 21068 or related 20000-level Art History course.

ART 49510 - Electronic Design II

Continuation of Electronic Design I. Investigation of contemporary design styles and exploration of issues in typography and information design through advanced projects in publication design and graphic illustration. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 39510.

ART 49518 - Design & Publishing Projects

An advanced exploration of the creative and production process for print media, organized around a semester-long group collaboration. The chosen project, executed in consultation with a guest designer, will explore the intersection of original text and image. It will proceed from research through imaging and printing, and result in a single issue publication or other printed matter. Interdisciplinary collaborations will be encouraged. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 49510 or permission of the instructor.

ART 49528 - Topics in Animation

Rotating semester-long topics in animation chosen from among a variety of animation processes, methods, and techniques. Coursework will involve both group and individual projects and may address topics such as rotoscoping, cutout animation, direct animation, puppet animation, claymation, etc. Specific course content will vary by semester and be announced beforehand. This course may be taken as many as four times for credit. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 39528.

ART 49540 - Design for the World Wide Web II

This course provides students who already have a solid foundation in web design an opportunity to extend their web skills to include scripting and interactivity, audio, video and animation over the web and sophisticated data handling and processing. In addition, the course will look at other multimedia environments on the Internet, such as the Palace, video conferencing, and audio tools. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 39540.

ART 49552 - Topics in Web Programming

Rotating semester-long topics in web programming providing introduction and practice in client-side scripting languages, server-side scripting languages, dynamically generated web pages (CGI), and database scripting and integration. Course may be taken up to four times. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 39552 or ART 39540 or ART 49540.

ART 49560 - Digital Video II

This advanced course covers topics related to complex compositions for animation, video art, editing techniques, post-production and research methods for motion graphic projects. It requires a basic knowledge of digital video applications (as covered in Digital Video I). Students will gain an in-depth understanding of the field by looking analytically at videos, through critiques, workshops, demonstrations, readings and class discussions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 39560.

ART 49570 - 3-Dimensional Computer Imaging and Animation II: Animation and Visual Effects

This advanced course builds upon the skills learned in 3-Dimensional Computer Imaging and Animation I. The class will focus on animation techniques and applying visual effects to scenes using dynamics. Topics include traditional and procedural animation, creating visual effects using particle systems and emitters, creating dynamic environments using physics-based properties, camera rigging and advanced rendering techniques. Importing and exporting relevant file formats will also be explored. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ART 39570.

ART 49590 - Digital Design Portfolio

Advanced projects and portfolio evaluation for students planning a career in digital design, illustration, web design and animation. Exploration of presentation techniques; introduction to the business of design, career resources and business practices. Portfolio preparation; practical experience in making portfolio presentations; creation of self-

promotion materials. Use of social media to develop a personal profile as a designer. Materials fee: \$40.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Three 3000-level EDM courses.

ART 49598 - Senior Thesis

Advanced design seminar in which students develop a sustained individual project in a major area of concentration (print, Internet, multimedia) along with collateral promotion and other presentation materials to be presented in an exhibition and documented in a process book. Students must meet with the Thesis advisor the semester before taking Thesis to write a project proposal; proposals must be approved before start of class.

Credits: 6. Materials Fee: \$40. Contact Hours: 6 hr./wk. Prerequisite: Completion of all major requirements for the BFA.

ASIA - Asian Studies Course Descriptions

Courses on Asian and Asian-American subjects offered at City College are listed below and are accepted toward fulfilling the program's requirements. Students may also take courses offered at other CUNY campuses with permission of the program director. Courses taken abroad during an exchange program may also be accepted with permission.

ASIA 10100 - Asian Cultures and Peoples

The major factors that have shaped the Asian countries and peoples; geography, civilization, migration, and settlements of ethnic groups; philosophies, religions, historical events, leaders, and modern political and socioeconomic institutions.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 10200 - Asian Literature in English Translation

Selected masterpieces of Asian literature. Lectures and classroom discussions, supplemented with audiovisual aids.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 20100 - Asians in America

The processes of assimilation, adaption, competition, conflict and adjustment of Asian minorities in the United States from the mid-19th century to the present.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 20200 - Contemporary Asia

The cultural tradition of Asia in general and of China and Japan in particular. The peoples and their psychological, educational, social, artistic, political and economic behavior.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 20402-20404 - Asian American Communities II: Practicum on Asian American Communities

Participation in community work. Students select a cooperating agency or organization and work in one of its programs.

Credits: 2-6.

ASIA 20500 - Contemporary China

Historical events, political, cultural and socio-economic conditions, and foreign relations of the People's Republic of China since 1949. Analysis of the Cultural Revolution; economic growth of the People's Republic; relations with the U.S. and the former Soviet Union; Communist leadership to the present.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 20700 - Asian Women

The position and role of Asian women in historical, political and psychological contexts. Traditional stereotypes; role in Asian history; Asian women in America; relationship to white and Third World women; alternatives to women's liberation.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 20800 - Asians and American Law and Politics

A comparison of the legal and political background of the East and West. American law and politics as they affect the lives of Asian minorities. Sample cases, familiarization with various legal proceedings and governmental institutions.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 21400 - Chinese Experience in America

The struggle for survival, acceptance, and full participation in American life from Gold Rush days to the present.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 30100-30300 - Honors I- III

Individual reading and research or individual field study project on a topic or area under the guidance of a faculty member to complete a thesis or report on a project at the end of the three-term sequence. Approval of Dean and program director required. Apply in NA 5/225 no later than December 10 in the Fall term or May 1 in the Spring term.

Credits: Variable cr..

ASIA 30700 - Asian American Communities I: Analysis of Asian American Communities

Empirical and theoretical analysis of community processes affecting Asian Americans, using New York's Asian communities (e.g., Chinatown) as models. Power structures, communications networks, role conflicts, and community change.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 31001-31004 - Independent Study

For students with special cultural, literary, or linguistic interests who wish to pursue independent study and research. For juniors and seniors only. Program approval required.

Credits: 1-4.

ASIA 31100 - Chinese Philosophy

Courses in the past three years have included: China and the World (History) Religious, Communal and Ethnic Conflicts in Modern India (History) Images of Asian Women through Film and Literature (Asian Studies) Chinese Family, Marriage and Kinship (Asian Studies) Memory, Identity and Historical Images (Asian Studies) Advanced Readings in Chinese Historical Writings (Asian Studies) Vietnam and the Cold War (Political Science) Asian Economic Development (Economics) Asian Cities (History) Asian-American Relations (History) Student Movements, Education and Chinese Intellectuals (Asian Studies) courses from other departments. Students are encouraged to take appropriate courses in other departments with the permission of their advisors. Some courses that may be of interest are listed below.

Credits: 3. Contact Hours: 3

ASIA 31100-32000 - Selected Topics in Asian Studies

Courses in the past three years have included: China and the World (History) Religious, Communal and Ethnic Conflicts in Modern India (History) Images of Asian Women through Film and Literature (Asian Studies) Chinese Family, Marriage and Kinship (Asian Studies) Memory, Identity and Historical Images (Asian Studies) Advanced Readings in Chinese Historical Writings (Asian Studies) Vietnam and the Cold War (Political Science) Asian Economic Development (Economics) Asian Cities (History) Asian-American Relations (History) Student Movements,

Education and Chinese Intellectuals (Asian Studies) Science and Technology in Chinese History (History).

ASIA 31116 - Japanese Film

Credits: 3. Contact Hours: 3

ASIA 31611 - Contemporary Japan

Credits: 3. Contact Hours: 3

ASIA 31612 - Contemporary Korea

Credits: 3. Contact Hours: 3

ASIA 31825 - Chinese Film

Credits: 3. Contact Hours: 3

ASIA 31826 - Chinese Gender & Nation In Film & Lit

Credits: 3. Contact Hours: 3

ASIA 33100 - Chinese Literature from the Early Period to 1919 (in English)

Historical review of literary development from the ancient to the modern period. Selections of masterpieces in poetry, prose, drama and fiction, in original versions or English translation, for reading and discussion. Reading knowledge of Chinese not required.

Credits: 3. Contact Hours: 3 hr./wk.

ASIA 33200 - Modern Chinese Literature (in English)

Leading authors and masterpieces since the May 4th Movement in 1919. Works from the Mainland, Taiwan, Hong Kong, Singapore and the West selected for reading and review. Reading knowledge of Chinese not required.

Credits: 3. Contact Hours: 3 hr./wk.

ASTR - Physics Course Descriptions

ASTR 10000 - Ideas of Astronomy

Explores the entire realm of the universe, its origins and history, and establishes our time and place and role in it. Our solar system, our galaxy, the expanding universe of many galaxies will be discussed along with more recent discoveries such as quasars, pulsars and black holes.

Credits: 3. Contact Hours: 3 lect., 1 rec. hr./wk., slides, films, planetarium shows

ASTR 30500 - Methods in Astronomy

Designed to fulfill the 30000-level core science requirement, the course covers the fundamental physical laws that underlie the motions of heavenly bodies, including Newtonian mechanics and Einstein's theory of relativity, planetary, stellar and galactic evolution; the methods, techniques and instruments used by modern astronomy, including the Hubble Space Telescope and planetary space probes.

Credits: 3. Contact Hours: 3 lect., 1 rec. hr./wk., slides, films, planetarium shows, field trips

BENG - Bengali Course Descriptions

BENG 19300 - Bengali for Heritage Speakers and Listeners I

A course designed for heritage speakers and heritage listeners of Bengali who speak and/or understand the language to various degrees. This course emphasizes grammar, reading, writing and vocabulary acquisition.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

BENG 19400 - Bengali for Heritage Speakers and Listeners II

A further study of the grammatical structure of Bengali with emphasis on the nuances of the target language and more intensive practice in reading, writing and vocabulary acquisition.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: BENG 19300 or placement examination.

BIO - Biology Course Descriptions

BIO 10000 - Biology: The Strategy of Life

The basic properties of living systems with emphasis on human beings as functioning biological entities.

Credits: 3. Contact Hours: 3 lect., 1 rec., hr./wk

BIO 10004 - Human Biology

(Satisfies CUNY Pathways Life & Physical Sciences Requirement)

A Biology course for non-science majors that emphasizes the function of the human body. Medical issues relating to personal and community health, as well as ethical issues will be discussed. Not open to Science majors. Students cannot receive credit for both BIO 10004 and BIO 10000.

Credits: 3. Contact Hours: 2 lec hr, 2 lab hours every other week Prerequisite: None, but it is recommended that have successfully completed 24 credits.

BIO 10005 - Introduction to Scientific Thinking

Introduction to Scientific Thinking aims to (1) teach students to read/analyze scientific literature, using the CREATE pedagogical strategy (www.teachcreate.org) to help them learn novel approaches to such analysis, (2) help students develop metacognitive awareness of their learning strategies, as well as the confidence that they can understand complex scientific material that is not presented in textbook format, (3) demystify science through email surveys of paper authors as well as assignments (e.g., grant panels) that put students in the roles of working scientists. This will be accomplished through close analysis of a series of readings from primary and secondary sources, and a combination of homework assignments and in-class activities designed to challenge students to develop and hone both their critical analytical skills and their creative thinking about science, particularly in the area of experimental design.

Credits: 3. Contact Hours: 3 hr./wk.

BIO 10050-10099 - Special Topics in Biology for Freshman & Non-Science Majors

These are experimental courses specifically designed to serve students who have no prior experience in College-level Biology courses and to precede the first course for Biology majors. Some may fulfill General Education requirements.

Credits: 3-4. Contact Hours: 3-4 hr./wk. Prerequisite: Or Coreq.: Completion of remediation, including ESL.

BIO 10100 - Biological Foundations I

Introduction to biology, emphasizing primarily the cell and molecular levels of organization. Topics include characteristics of life, cellular organization and diversity, chemistry of life, bioenergetics, reproduction and early development, and major living groups. The course features in-depth study of selected topics that provide the foundation for upper level study. Students develop critical thinking and technical skills that are essential for mastering the content areas and for being successful in upper level courses. These include: vocabulary skills, critical thinking, collaborative learning, microscopy, collection and handling of scientific data, and elements of scientific investigation. Required for Biology Majors.

Credits: 4. Contact Hours: 3 lect., 3 lab., hr./wk. Prerequisite: Or Coreq.: MATH 19000 or MATH 19500 or MATH 20100 or MATH 20500.

BIO 10200 - Biological Foundations II

Second semester of Introductory Biology, emphasizing organismic biology, evolution, and ecology. Topics include heredity, macro- and microevolution, structure and function of body systems, and ecology. The course features a survey of topics in lecture and in-depth study of selected topics in laboratories and workshops. Students develop critical thinking and technical skills that are essential for mastering the content areas and being successful in further study. These include: vocabulary skills, problem solving, collaborative learning, computer skills, experimental design, collection and analysis of scientific data, and preparing scientific reports. Required for Biology majors. Materials fee: \$10.

Credits: 4. Contact Hours: 3 lect., 3 lab., hr./wk. Prerequisite: A grade of C or better in BIO 10100 or an equivalent course or permission of the instructor.

BIO 20600 - Introduction to Genetics

A thorough introduction to the principles of genetics. Using a combined cell biological and Mendelian genetic approach, the course covers DNA organization, chromosome structure, genes and alleles, and transmission of genetic information in normal and genetically compromised organisms.

Credits: 4. Contact Hours: 3 lect., 1 rec., hr./wk. Prerequisite: BIO 10100 and BIO 10200 or equivalent.

BIO 20700 - Organismic Biology

Emphasizes the physiological adjustments organisms make to specific challenges in their environments. Bioenergetics, osmoregulation and transport are the areas of focus. Laboratories are investigational and intended to develop skills in experimental design, the use of technology in acquiring data, data analysis and presentation, and in scientific writing. The development of problem solving and thinking and analysis in biology is emphasized in all aspects of the course.

Credits: 4. Materials Fee: \$30. Contact Hours: 2 lect., 4 lab., hr./wk. Prerequisite: BIO 10100 and BIO 10200 or equivalent; pre- or coreq.: CHEM 10301, ENGL 21003, and MATH 19500.)

BIO 22800 - Ecology and Evolution

Introduction to the basic principles of ecology and evolutionary biology emphasizing quantitative approaches and hypothesis testing. Computer literacy is attained using spreadsheets and the Internet.

Credits: 4. Materials Fee: \$10. Contact Hours: 2 lect., 4 lab., hr./wk. Prerequisite: BIO 20600, MATH 20200 Corequisite: MATH 20900 OR MATH 17300

BIO 22900 - Cell and Molecular Biology

Fundamental concepts at the cellular and molecular level of living organisms, including structure, metabolism, genetic continuity, and response mechanisms.

Credits: 4. Materials Fee: \$10. Contact Hours: 3 lect., 3 lab., hr./wk. Prerequisite: BIO 20600.

BIO 24700 - Human Anatomy and Physiology II

Basic chemistry, the composition of body fluids, the structures and function of the cell, body tissue types, and the structure and function of the integumentary, skeletal, muscular and circulatory systems. Lectures will be complemented by laboratory exercises using models and animal preparations. This course does not count towards the Biology Major elective requirements.

Credits: 4. Materials Fee: \$20. Contact Hours: 3 lect., 3 lab. hr./wk

BIO 24800 - Human Anatomy and Physiology II

The structure and function of the urinary, respiratory, digestive, endocrine, nervous, and reproductive systems. Lectures will be complemented by laboratory exercises using models and animal preparations. This course does not count towards the Biology Major elective requirements.

Credits: 4. Materials Fee: \$25. Contact Hours: 3 lect., 3 lab. hr./wk

BIO 30100-30300 - Honors I-III

Honors work requires the approval of the Dean, of the Departmental Committee on Honors and Independent Studies and of the mentor. Application must be made in J1320 and also to the Departmental Committee. Entrance standards are BIO 10100, BIO 10200, BIO 20600, and at least two of BIO 20700, BIO 22800, or BIO 22900 for Biology majors with an average of 3.5 in Biology and 3.0 or better overall. Only laboratory or field projects will be accepted for Honors. All students participating are expected to present the results of their work at the Honors and Independent Study symposium in the Spring. A written paper must accompany the presentation. Although mentors are responsible for giving grades, these grades will be reviewed by the Committee before a final grade is awarded.

Credits: 3. Contact Hours: 3 cr./sem. for a total of 9 cr. which must be completed.

BIO 31000 - Independent Study

Individual laboratory, field, or library investigation of a problem. Recommended background: BIO 10100, BIO 10200, BIO 20600, and at least two of BIO 20700, BIO 22800 or BIO 22900, with a 3.0 average in Biology. Apply to the Committee on Honors and Independent Studies. Students may not register for Independent Study without written permission from the Committee every semester. Students must present a written proposal with well defined goals to the committee for approval. No more than three credits of library research may be taken. In order to receive credit, a written paper must be produced and presented to the Committee. Students who work with mentors outside the department must also have a co-sponsor inside the department. Although mentors are primarily responsible for giving grades, these grades will be reviewed by the Committee before a final grade is awarded. Course is repeatable up to four courses; a maximum of nine credits total of Independent Study and Honors can be taken.

Credits: 1-3. Contact Hours: 1-3 cr./sem.

BIO 31100-32000 - Selected Topics in Biology

Discussions, student seminars, literature survey, experimental study focusing attention on specific areas in biology. Course topics will be selected by instructor and announced early in the preceding semester.

Credits: determined by instructor. Contact Hours: Hrs. and cr. (to a maximum of 4 cr.) to be determined by instructor. Prerequisite: Prerequisites to be determined by instructor.

BIO 32100 - Physiological Processes

This course is designed to introduce fundamental concepts of physiology to biomedical engineering students. Areas covered include muscular function, cardiovascular system function, bioelectrical signals, capillary-level transport, organ-level exchange and immune system function. For Biomedical Engineering Students only.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BIO 10100 and MATH 20103.

BIO 33000 - Survey of the Vertebrates

Survey of the major features of the vertebrates, including brief modern classification of the major groups and summary review of their morphological features, evolutionary history, distribution, ecology, and social behavior. Specific additional characteristics such as mimicry, ectothermy/endothemy, cannibalism, migration, predation, defense and use of venom will be discussed. Special attention is given to conservation, destruction of the environment and human impact on vertebrate life.

Credits: 3. Contact Hours: 3 hr./wk.

BIO 34000 - Biology of Invertebrates

The structure and function of various invertebrates selected to illustrate morphological, physiological and ecological adaptations.

Credits: 4. Contact Hours: 4 lab. hr./wk. Prerequisite: BIO 10200. 2 lect.,

BIO 34500 - Botany

Survey of the structure, physiology, diversity and ecology of photosynthetic plants and fungi.

Credits: 4. Contact Hours: 2 lect., 4 lab. hr./wk. Prerequisite: BIO 10200 and CHEM 10301.

BIO 34900 - Field Botany

Identification and ecological relationships of local plants.

Credits: 4. Contact Hours: 2 lect., and at least 4 hr. of fieldwork/wk. Prerequisite: BIO 10200 and BIO 34500.

BIO 35000 - Advanced Microbiology

Characteristics and systematics of prokaryotes and unicellular eukaryotes. Nutrition growth, physiological ecology, and comparative metabolism of bacteria. Methods used to study microbes. Introduction to viruses, microbial genetics, and mechanisms of microbial pathogenesis. Applied microbiology, microbial ecology, and microbes in symbioses.

Credits: 4. Materials Fee: \$25. Contact Hours: 2 lect., 4 lab., hr./wk. Prerequisite: BIO 22900.

BIO 35400 - Introduction to Neurobiology

Introduction to the physiology and organization of the nervous system. Topics include essentials of cellular and molecular neurobiology, electrophysiology, synaptic transmission, sensory and motor systems, development, neural basis of learning, memory, and cognition.

Credits: 3. Contact Hours: 3 lect.; hr./wk. Prerequisite: BIO 20700 or BIO 22900.

BIO 35500 - Introduction to Analysis of Scientific Literature Using CREATE

This course has two goals: teach students to read primary literature (journal articles) and humanize science/scientists. We use a newly devised method, C.R.E.A.T.E. (Consider, Read, Elucidate the hypotheses, Analyze the data, and Think of the next Experiment) and supporting materials to give students tools needed for reading and analysis of complex material, interpretation of tables, graphs, charts, etc, and critical analysis of data. Students are challenged to devise their own follow-up experiments for each paper read. Because we read papers in series, and communicate directly with some of the authors, students also get a "behind the scenes" view of how projects evolve in labs and about the people behind the published papers. If you take this course, you can expect to significantly improve your scientific reading/analysis skills, and get a more realistic perspective on "how science is done."

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: BIO 20600 or BIO 22900.

BIO 37500 - Developmental Biology

An in-depth analysis of the cellular and molecular mechanisms regulating development of animals and plants. Topics include: the production and storage of genetic information; sperm egg interactions; nuclear and cytoplasmic determinants; morphogenetic movements, inductive interactions and the development of primary organ rudiments; organogenesis; growth, differentiation and morphogenesis, mechanisms of aging, cancer, the immune system and regeneration; development of birth abnormalities; role of experimentation in the analysis of major developmental mechanisms in animals.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: BIO 22900.

BIO 37900 - Developmental Neurobiology

This course covers the principles underlying the development of a functional nervous system. Topics covered include early neural determination and differentiation, process outgrowth, target

recognition, and synapse formation. Students will be expected to read and discuss primary literature.

Credits: 3. Contact Hours: lect., 3 hr/wk. Prerequisite: BIO 22900.

BIO 38000 - Eukaryotic Genetics

Classical, molecular, and population genetics of humans and model eukaryotic organisms (corn, yeast, fruit flies, etc.). Includes experimental and analytical techniques; human genetic disorders; forensic and diagnostic applications. Recommended for all life science students, especially those with career goals in the health and/or legal professions.

Credits: 4. Contact Hours: 2 lect., 4 lab. hr./wk. Prerequisite: BIO 22900 and BIO 22800.

BIO 40100 - Cardiovascular, Renal, and Respiratory Physiology

An in-depth exploration of the integrated functioning of the cardiovascular, renal and pulmonary systems. Emphasis is primarily on human dynamic, non-pathological responses to a range of conditions including exercise and extreme environments. Structural and physiological aspects are covered. Clinical case studies highlight the interdependence of the systems. This course is appropriate for students considering health-related careers or advanced study in biomedical science. Not open to students who have taken BIO 33300.

Credits: 4. Contact Hours: 3 lect., 3 lab.hr. /wk. Prerequisite: BIO 20700 or permission of instructor.

BIO 40500 - Development and Evolution

Principles of development as they relate to evolutionary changes in morphology of organisms. Discussion and analysis of classic papers in the literature.

Credits: 3. Contact Hours: 3 lect., hr./wk. Prerequisite: BIO 22800 or equivalent.

BIO 41000 - Cell Development and Cellular Senescence

Current topics related to the molecular biology of cell development including cell death or apoptosis and cellular aging. A series of lectures which cover pertinent topics, such as oxidative stress, genetic and stochastic factors in aging. Students are required to present orally two primary journal articles and to write a final paper in which a review of the current literature and provision of experimental designs are required to answer a chosen question.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: BIO 22900.

BIO 41200-41299 - Seminars on Selected Topics in Biology

Seminar course on current topics in biology with extensive group discussion and written assignments. Required readings will consist of a considerable amount of primary literature. Course topics will be selected by instructor and announced early in the preceding semester.

Credits: 3 or 4. Contact Hours: 3 or 4 hr./wk.

BIO 42000 - Virology

Introductory survey of diverse genera of animal viruses and bacteriophages and methods used in the classification, detection, and quantification of viruses. The course emphasizes an understanding of the mechanisms of DNA/RNA replication, expression and macromolecular assembly into functional, infectious units (virions) in different viruses. Selected examples are presented in detail, including oncogenic RNA/DNA viruses and HIV/AIDS.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: BIO 22900 and BIO 35000, or permission of instructor.

BIO 42500 - Cancer Biology

Introduction to the fundamental principles of the cellular and molecular biology underlying cancer. Lectures will include principles of cell division and growth, and role of growth factors, oncogenes, tumor suppressor genes, and angiogenesis on the development of cancer. Discussions will

include cancer epidemiology, health disparities, cancer prevention, and cancer treatment.

Credits: 3. Contact Hours: 3 lect., 3 hr./wk. Prerequisite: BIO 22900.

BIO 43000 - Genetics of Prokaryotes

The lectures will cover basic microbial genetics, including the biology of bacteria and their phages, structure and function of nucleic acids, gene transmission in microbial systems and the mechanisms of genetic recombination, transposition, and gene regulation. The laboratory experiments will teach mastery in techniques of mutagenesis, selection and screening, gene mapping, and use of transposons in the construction of genetically useful strains.

Credits: 4. Contact Hours: 3 lect., 2 lab. hr./wk. Prerequisite: BIO 22900 and BIO 35000, or permission of the instructor.

BIO 44300 - Insect Ecology

Introduction to the diversity and biology of major insect groups, focusing on the role of insects and other arthropods in natural ecosystems and their role in human affairs.

Credits: 4. Contact Hours: 6 hr./wk. Prerequisite: BIO 22800 or permission of instructor.

BIO 44900 - Biology of Birds

The goals of this course are to introduce students to the immense variation among birds, compare and contrast the biology of birds with that of mammals and other vertebrates, and provide perspective and understanding of Earth's ecology and biodiversity. The course consists of a combination of a standard lecture format, laboratory activities, and demonstrations. Field trips will be scheduled as necessary to reinforce scientific concepts.

Credits: 4. Contact Hours: 4 combined lect., & lab., hr./wk Prerequisite: Or Coreq.: BIO 20700 or BIO 22800.

BIO 45000 - Symbiosis

Symbiosis is a major phenomenon for all levels of living organisms and has been a major phenomenon in evolution and the adaptation of various groups. The course aims to explain scientific methodology and approaches used in scientific inquiry on symbiotic interactions.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: Or Coreq: BIO 22900.

BIO 45100 - Movement and Muscle: The Neuroscience of Motor Control

The function and organization of motor systems. Topics include biomechanics, muscle organization and physiology, the neural activation of muscle, spinal and brainstem reflexes, locomotion, the control of arm and eye movements, motor planning, and motor learning. Not open to students who have taken BIO 40000 or BIO 31311.

Credits: 3. Contact Hours: 3 hr/wk. Prerequisite: BIO 20700 or BIO 35400 or permission of instructor.

BIO 45300 - Conservation Biology

Principles of conservation biology, including habitat fragmentation, exploitation of natural resources, species extinction and the consequences of inbreeding in small populations.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BIO 22800 or equivalent.

BIO 45400 - Sensory Perception

Different types of sensory systems with their functional modalities will be presented. The biological bases for how these functions are generated and modified will then be described. As vision is the principal means of perception, we will focus in this course most on visual processing. Scientific data will be integrated into the lectures, such that students develop critical skills in analyzing data and proposing hypotheses.

Credits: 3. Contact Hours: 2 lect., hr./wk. Prerequisite: BIO 20700 or BIO 22900.

BIO 45500 - Advanced Ecology

Introduction to the analytical techniques necessary to quantify modern ecological theory. Emphasis on application of mathematical tools and computers to models of population growth, interspecific interactions and ecosystem function.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BIO 22800 and MATH 20900 OR MATH 17300 OR 20200.

BIO 45800 - Biogeography

Introduction to biogeography, the study of spatial patterns of biological diversity. The course addresses the study of geographic variation in nature at all levels from genes to communities to ecosystems, with both ecological and evolutionary perspectives. It includes analyses of real data regarding biogeographic problems relevant to conservation biology.

Credits: 3. Contact Hours: 3 lect., hr./wk. Prerequisite: BIO 22800 or permission of instructor.

BIO 45900 - Biological Oceanography

A survey course in biological oceanography that includes discussion of the physical and chemical properties of the ocean, processes controlling primary and secondary production, biodiversity, and special environments such as polar ecosystems and upwelling systems. Lecture only.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 10401, BIO 22800 or permission of the instructor.

BIO 46000 - Animal Behavior

The biological bases of behavior, with emphasis on such topics as the development, evolution, genetics and ecology of behavior; sensory physiology; social behavior and communication.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BIO 10200.

BIO 46100 - Laboratory in Animal Behavior

Experiments and observations to demonstrate various types of behavior and behavioral capacities at different phyletic levels. Introduction to techniques of behavioral research through experiments and an individual research project.

Credits: 2. Contact Hours: 3 lab. hr./wk. Corequisite: BIO 46000.

BIO 46400 - Laboratory in Neurobiology

Laboratory course in which techniques used in cellular and systems neurobiology are taught in the context of solving biological problems. Techniques to be covered include basic histological, molecular biological, electrophysiological, and behavioral techniques used in modern neurobiology.

Credits: 3. Contact Hours: 6 lab. hr./wk. Prerequisite: BIO 35400.

BIO 46600 - Plant Physiology

The growth, development, metabolism, nutrition and water relations of vascular plants and algae.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BIO 20700 or BIO 22900.

BIO 46800 - Comparative Animal Physiology

This course examines the physiological processes involved on energy acquisition (e.g., nutrition, digestion) and expenditure (e.g., thermoregulation, locomotion) as well as water balance (e.g., osmotic stress, kidney function) in a wide variety of organisms inhabiting diverse environments. Laboratory exercises include problem solving recitations, experimentation and interpretation of data.

Credits: 4. Contact Hours: 2 lect., 4 lab. hr./wk. Prerequisite: BIO 20700.

BIO 48100 - Introduction to Epigenetics

The course will use primary research articles to introduce biology majors to epigenetic mechanisms that regulate gene expression, how epigenetic modifications are propagated, and the phenotypic consequences of normal vs. abnormal epigenetic regulation in disease, development and evolution.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BIO 20600.

BIO 48300 - Laboratory in Biotechnology

This course is designed to give students an introduction to modern molecular biological techniques in the context of solving biological questions. The techniques that will be taught include DNA isolation, restriction enzyme mapping, subcloning of DNA fragments into plasmids, polymerase chain reaction, protein purification, cell culture, and other techniques of gene manipulation. Emphasis will be on application of recombinant DNA technology. Materials fee: \$30.

Credits: 5. Materials Fee: \$30. Contact Hours: 2 lect., 6 lab. hr./wk. Prerequisite: BIO 22900 and permission of instructor.

BIO 48500 - Evolution

Historical development and current understanding of the principles of evolution.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BIO 22800 or permission of instructor.

BLST - Black Studies Course Descriptions

BLST 10100 - African Heritage and the Afro-American Experience

Introduction to Black "roots" from ancient Africa to contemporary America as an orientation to the nature of Black Studies emphasizing its relationships to world history, Europe, Asia, the Americas, slavery, Reconstruction, colonization, racism, and their politico-economic and cultural impact upon African descendants worldwide.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 10200 - African Heritage and the Caribbean-Brazilian Experience

Analysis of historical conditions which shaped the lives of African peoples in the Caribbean and Brazil emphasizing cultural continuities, human organization and similarities in global Black experience among Africans on the continent and in the Western hemisphere, vis-a-vis European politico-economic control and cultural impact.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 12300 - African Politics

The emergence of the modern state structures from colonial Africa. A comparative analysis of colonialism, nationalism and political development of selected African countries.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 12400 - National Building and Development in Africa

A survey of patterns of leadership, ideologies, and political organization in contemporary Africa. The "revolutionary" pattern will be contrasted to the "conservative" pattern in an effort to provide a contextual understanding of the relationship between political attitudes and social problems.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 12800 - The United Nations and New Nation States

The major legal and constitutional problems in international organizations arising in the work of the United Nations with particular reference to decolonization, apartheid, transfer of "appropriate"

technology to the developing world, trusteeship questions, peacekeeping functions, human rights, and domestic jurisdiction.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 13200 - The Afro-American Child in His Urban Setting

The sociological, psychological and educational needs of Black children in New York City public and private schools. (Education majors must consult their advisor.)

Credits: 3. Contact Hours: 3 hr./wk.

BLST 13400 - The Harlem Community

The origins and ethnic development of the Harlem community: demographic trends, institutions, culture, resources, and the role of Harlem as a training ground for Black leadership. Field learning experiences include visits to historic sites and community landmarks.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 13500 - Economic Development of the Black Community

The impact of technology and industrialization on the Black ghetto; the economics of transportation; perpetuation or disintegration of the ghetto; public welfare; municipal services; effects of migration, limited autonomy, and hostile external political and fiscal policies upon continuous underdevelopment.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 14500 - Capitalism and Colonialism in Contemporary America

White America is described as capitalist and colonialist. Efforts will be made to comprehend the relative importance of the two phenomena for strategies of liberation depending upon the understanding of who and what is the American and America.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 14700 - The Civil Rights Movement

The struggle for civil rights related to differences in organizational structures, ideologies and tactics. An attempt is made to evaluate each organization in its situation and in contrast to its social environment.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 14900 - Religion and Survival

An historical analysis of the role of religion and the church in sustaining the survival of Black people within white America.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 15700 - Racism and the American Legal System

Contemporary legal institutions, their intrinsic race and class biases, the peculiar development and entanglement of the institution of slavery and American jurisprudence, and the effect of the racist application of the American legal system on every facet of the Black experience.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 16100 - Caribbean and Brazilian Heritage

A survey of economic and sociocultural factors. History of the Caribbean and Brazil, with special emphasis on the experience of African peoples dispersed in these areas, their role in the affairs of the Third World, varied colonial experiences, covering the pre-Columbian period through the present.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 16300 - Race and Politics in the Caribbean

The relationship between race and class; political power dependency in various Caribbean areas. The colonial and neocolonial experiences of key islands, and movements toward autonomy and independence.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 16600 - Caribbean Immigration

An analysis of the economic and political factors leading to the 19th and 20th century population movements into, within, and from the Caribbean region, stressing migration to the United States, the Caribbean communities in New York, Panama, Central America, London, Paris, Montreal, New Haven, Caracas and Toronto. Immigration issues worldwide will be studied comparatively.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 17100 - Roots: Seminar on the Black World Experience

The study of a people involuntarily and forcibly transported from Africa to the Americas. The organizing concepts include African world history, culture and religion, family and genealogy, capitalism and slavery, humanism and communalism, socialization and values, cosmology and philosophical thought.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 17600 - The Black Revolution

A survey of the forces shaping the current unrest in the world-wide Black community. Movements that project the changed attitude toward being Black for Blacks and non-Blacks. Highlights both the positive and negative reactions resulting from the new self-pride on the part of Black people.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 18900 - Sociopolitical Impact of Race and Racism

The historical development and contemporary impact of the concepts of race and racism, focusing upon the early attempts at human classification, notions of polygenesis, the biological and social concepts of race, the origins of racism, slavery, sexism, institutional racism, and contemporary polarization.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 19000 - Malcolm X: His Life, Leadership and Legacy

Charismatic, mesmerizing, energetic life. Rise from criminal to international fame. Leadership greatly influenced poor African-American masses, stunned Black conservatives and shocked white America. Black Muslims controversy vis-a-vis civil rights forced him to fight independently. Left legacy of beloved martyr slain in Black struggle.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 20000-20400 - Practicum

Field work experience in various areas of community service and pre-professional work. Hours arranged. One day per week in field and two hour seminar bimonthly. Students are limited to two courses.

Credits: 3 cr. each..

BLST 21000 - African Area Studies

Credits: 3. Contact Hours: 3 hr./wk.

BLST 21000-21300 - African World Area Studies

A semester or summer-long course designed to expose selected groups of students to major areas populated by persons of African descent through in-area observation, study, laboratory, and cooperative volunteer work experiences with students and other citizens of the area visited.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 21100 - Afro-American Studies

Credits: 3. Contact Hours: 3 hr./wk.

BLST 21200 - Caribbean Studies

Credits: 3. Contact Hours: 3 hr./wk.

BLST 21300 - Brazilian and Afro-Latin American Area Studies

Credits: 3. Contact Hours: 3 hr./wk.

BLST 30100-39400 - Honors

Approval of the Program Director required. no Apply no later than December 10 in the Fall term and May 1 in the Spring term.

Credits: Variable cr. Contact Hours: Variable cr., but usually 4 cr./sem.

BLST 31000 - Independent Reading in Black Studies

Approval of Program Director is mandatory. Program thoroughly planned and structured. The student will be required to produce evidence of the readings available and relevant to his/her interests. The readings must be compiled into a comprehensive report. Limited to upper-class students with adequate background in Black Studies.

Credits: 1-4.

BLST 31110 - Black Masculinities

Credits: 3. Contact Hours: 3

BLST 31608 - Af-Latinos-Hist-Cul

Credits: 3. Contact Hours: 3

BLST 31713 - Blk Art In Aids Age

Credits: 3. Contact Hours: 3

BLST 32300 - Islam In The Afr Amer Expernce

This class will examine how Islam has shaped and has been shaped by Black political and cultural discourses on race, class, and gender to produce a diverse and dynamic African-American Muslim tradition. We will also look at how African-American Muslims have attempted to negotiate their multiple identities as Black, American, and Muslim.

Credits: 3. Contact Hours: 3

BLST 33000 - Afro-American Heritage: 1619 to 1865

A survey of the sociocultural experiences of African peoples in the North American diaspora defining the historical, economic and political origins of the contemporary position of the Afro-American.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 33100 - Afro-American Heritage: 1865-Present

A survey of the Black experience in America, this course will focus upon the major issues, trends, personalities, and literature of the period, the contradictions of Emancipation, and will examine Reconstruction, migration, and exodus, Black Renaissance, the Civil Rights Movement, Black power and nationalism.

Credits: 3. Contact Hours: 3 hr./wk.

BLST 33125 - Womn Africn Diasopra

Credits: 3. Contact Hours: 3

BLST 33300 - The Black Woman

The various contemporary situations and problems peculiar to Afro-American women in the community and in American society. Entails a study of such institutions as marriage, family, childrearing practices, religion, politics and business. Attention also given to how she is projected in literature and theater. A comparative study of African and Caribbean women will be presented.

Credits: 3. Contact Hours: 3 hr./wk.

BME - Biomedical Engineering Course Descriptions

BME 10100 - Introduction to Biomedical Engineering

An overview of the field of biomedical engineering designed to acquaint the students with its interdisciplinary nature; research areas presented by the biomedical engineering faculty.

Credits: 1. Contact Hours: 1 hr./wk. Prerequisite: Or coreq.: MATH 19500 (min. C grade). Offered: Spring/Fall.

BME 20500 - Bioelectrical Circuits with Laboratory

Basic concepts and electrical components. Basic circuit laws. Series and Parallel DC Circuits analysis. DC Circuit theorems. PSpice DC Circuit Analysis. Capacitors and inductors. Transient analysis. Sinusoids and phasors. Sinusoidal steady state analysis. PSpice AC Circuit Analysis. Operational amplifiers. Frequency response.

Credits: 4. Contact Hours: 2 lecture, 2 lab hr./wk. Prerequisite: Or coreq: PHYS 20800 (min. C grade); MATH 39100 (min. C grade). Offered: Spring Only.

BME 22000 - Biostatistics and Research Methods

Development of tools necessary in biomedical engineering, including gathering information from online and library sources, reading and understanding research articles, understanding experimental design (prospective vs. case-controlled study, correlation vs. causality etc.), graphing 1D and 2D data, computing basic statistics (mean, variance, histogram), evaluating hypothesis tests (t-test, ANOVA), estimating measurement error and propagating errors, computing linear regression coefficients, writing technical reports and giving oral presentations. All visualization and numerical methods will use MATLAB, which will be introduced from the beginning. All methods will be discussed in the context of real-world biomedical problems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Pre- or coreq: MATH 20300, BME 10100. Offered: Fall Only.

BME 30500 - Dynamical Systems and Modeling

This course addresses the development and analysis of mathematical models for time varying systems. The dynamical systems employed as examples will be of mechanical, electrical and chemical origin and will include those associated with physiological control, dynamics and vibrations, electrical circuits and chemical reactions. Topics include systems of ordinary differential equations, Laplace transforms, transfer functions, frequency response analysis, dynamics of feedback systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BME 20500 or ENGR 20400, and ME 24600; pre- or coreq.: MATH 39200. Offered: Fall Only.

BME 31000 - Experimental Methods in BME

The laboratory course focuses on the principles of experimental design, application of statistics, interpretation of data, and technical writing. Students will perform modular hands-on laboratory experiments in biotransport, biological control, signal analysis, imaging, biomechanics, biomaterials, and cell and tissue engineering.

Credits: 3. Contact Hours: 1 lecture, 3 lab hr./wk. Prerequisite: BME 22000, ME 33000, ENGL 21007; pre- or coreq.: BIO 22900. Offered: Spring Only.

BME 40500 - Biomedical Transducers and Instrumentation

Basic principles of biomedical electronics and measurements including sensors, transducers, amplifiers, filters, data acquisition and analysis, signal-to-noise ratio, artifacts; display of biological data using digital computers; design and analysis of biomedical instrumentation; laboratory applications of digital signal processing and real-time analysis of physiological signals.

Credits: 4. Contact Hours: 3 lecture, 1 lab hr./wk. Prerequisite: BME 30500. Offered: Spring Only.

BME 45000 - Biomedical Engineering Senior Design I

The first course of a two-course sequence in which a year-long group project will be undertaken to design and construct a biomedical engineering device or system. Course topics include project planning and management as well as the regulatory, ethical, and legal aspects of medical device systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BME 31000, BME 50100, BME 50300; pre- or coreq.: BME 50200, BME 50500. Offered: Fall Only.

BME 46000 - Biomedical Engineering Senior Design II

The second course of a two-course sequence in which a year-long group project will be undertaken to design and construct a biomedical engineering device or system. Course topics include project planning and management as well as the regulatory, ethical, and legal aspects of medical device systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BME 45000. Offered: Spring Only.

BME 50100 - Cell and Tissue Mechanics

The application of mechanics to the functioning of the human body at all levels from the cellular to the tissue, organ and whole body. The applications of rigid object mechanics to ergonomics, orthopaedic and sports biomechanics are considered with analysis of the knee, hip, and spine. Introductory continuum mechanics is used to describe the models of hard tissues such as bone and dentin and soft tissues such as skin, muscle, blood vessels, articular cartilage, tendons and ligaments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: {ME 33000 or CHE 31000} and BIO 32100. Offered: Spring Only.

BME 50200 - Cell and Tissue Transport

The course covers fundamental transport principles governing physiological or pathological transport phenomena in living systems and applications of these transport principles in the design of biomedical devices. Topics include transport across cell membrane, cell surface ligand-receptor kinetics, molecular transport within cells, cell adhesion, transvascular transport, and transport in organs.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: {CHE 34100 or ME 35600} and BIO 32100. Offered: Fall Only.

BME 50300 - Cell and Tissue-Biomaterial Interactions

This course is concerned with the reaction and interaction of both inert and bioactive foreign materials placed in the living human body. Topics to be discussed include biocompatibility; characterization of non-living biomaterials; reaction of biological molecules with biomaterial surfaces; host response to implants; effects of degradation on implant materials; bioactive surfaces; resorbable implant materials; standardization and regulation of implant materials; in vitro and in vivo biomaterial testing methods; orthopaedic and other specific applications of biomaterials; and introduction to tissue engineering.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: {ME 33000 or CHE 31000} and BIO 32100. Offered: Spring Only.

BME 50400 - Cell and Tissue Engineering

The course covers basic engineering principles/technologies applied in Tissue Engineering. History, current research advances and challenges, as well as existing obstacles in Tissue Engineering are also covered. The topics include quantitative cell and tissue biology, cell and tissue characterization, tissue engineering methods and design, and clinical implementation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BIO 22900 and BME 31000. Offered: Spring only.

BME 50500 - Image and Signal Processing in Biomedicine

This course introduces basic medical imaging and biomedical signal processing methods. It will present medical imaging modalities such as computed tomography (CT), magnetic resonance imaging (MRI), and

positron emission tomography (PET). Students will gain understanding in the basic physics of image acquisition and the algorithms required for image generation. In biomedical signal processing the emphasis is on bio-potentials such as electroencephalograms (EEG) and electrocardiograms (ECG). Basic image enhancement and image analysis will be presented in the context of x-ray imaging and microscopy. The course will include linear systems, random processes, and estimation theory. Students will gain hands-on experience in image and signal processing through Matlab programming in class and in assignments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: BME 40500 or (EE 25900 and EE 30600 and EE 33000). Offered: Fall Only.

BME 51000 - Microfluidic Devices in Microtechnology

This lecture/laboratory course focuses on the fundamentals of modern microfluidic devices with applications to biomedical measurements. Students will review fundamental properties of microfluidic systems including the effects of viscous flow, heat transfer, and electromagnetic phenomena on biological systems. Multiple laboratory modules will expose students to photolithographic and surface treatment techniques required for device development. An end of term project will require students to analyze designs of upcoming biomedical inventions and present their critiques via written report and oral presentation.

Credits: 3. Contact Hours: 3 hrs./wk. Prerequisite: BME 31000 and CHE 34100. Offered: Fall Only.

BME 52000 - Practical Tools for Medical Device Design

This course provides training in the systematic design, fabrication, testing, and documentation process required for commercial development of medical devices. Two devices related to cancer treatment, one diagnostic and other therapeutic, will be used as semester-long case studies to illustrate the development process to students. The course will be based on an apprentice model, and project kits will be provided to the students that will help them in performing course work. Topics covered include introduction to product development life cycle, FDA regulated design documentation activities, concept generation and evaluation, computer-aided device design, design review process, design for manufacturing, bio-safe material selection, manufacturing processes available for medical device fabrication, testing methods, and preparation of documents for regulatory submission.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Or Coreq: BME 40500.

BME 59000 - Biomedical Engineering Independent Study

An independent research and/or design project performed under the direction of a faculty mentor. At the conclusion of the project a written project report must be submitted to the faculty mentor.

Credits: Variable cr.. Prerequisite: Formal (written) commitment of a faculty mentor.

BME 59100 - Special Projects in Biomedical Engineering

An independent project that enables students to perform BME technical and/or professional service to the College and/or neighboring community. Students will assist faculty conducting studies related to BME education and/or training. Faculty sponsor is required. A written project report must be submitted to the sponsor at the project's conclusion.

Contact Hours: 1 Prerequisite: Written permission of instructor.

CE - Civil Engineering Course Descriptions

CE 20900 - Structural and Site Plans

Graphical methods of conveying ideas and information related to civil engineering projects. Functional planning. Structural plans and details in steel and concrete. Topographic mapping. Earthwork projects.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: CSC 10200; pre- or coreq.: MATH 20300.

CE 23100 - Statics

Laws of motion and equilibrium. Elements of vector algebra. Equilibrium of rigid bodies. Constraints, and reactions. Equilibrium of machines and hinged frames. Internal forces in trusses and beams. Shear and bending moment diagrams. Analysis of cable systems. Friction. Centroid and centers of gravity. Moments of inertia. Work and virtual work. Stability of equilibrium.

Credits: 3. Contact Hours: 5 hr./wk. 3 lecture, 2 recitation Prerequisite: PHYS 20700 (min. C grade), CSC 10200; MATH 20200 (min. C grade).

CE 26400 - Civil Engineering Data Analysis

Role of statistics and probability in civil engineering. Measurability and variability. Data collection. Descriptive analysis. Presentation of data in the context of civil engineering. Numerical descriptive statistics. Probability distributions and their application to civil engineering. Introduction to inferential statistics. Applications of civil engineering quality control. Linear correlation and regression analysis.

Credits: 3. Contact Hours: 2 class, 3 lab hr./wk. Prerequisite: CSC 10200; pre- or coreq.: MATH 20300, ENGL 21007.

CE 31600 - Civil Engineering Decision and Systems Analysis

Civil Engineering systems analysis. Modeling and optimization of large scale CE systems, including structural, hydraulic, environmental and transportation systems, and construction projects. Economic evaluation of engineering projects. Decisions under uncertainty. Design as multi-dimensional resource allocation. Scheduling models. Applications to management and planning. Computer applications.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 26400, CE 33500, MATH 39200.

CE 32600 - Transportation Planning

Introduction to transportation planning concepts and methods. Travel demand forecasting. Transportation economics. Quantitative techniques in transportation planning: discrete choice models, regression methods and optimization techniques. Societal impacts including environmental, land use, safety and quality of life issues. Project evaluation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 26400; Pre- or coreq: CE 33500.

CE 32700 - Transportation Systems Engineering

Principles and practice of transportation engineering. Introduction to traffic engineering concepts including traffic flow theory, multimodal level of service analysis, and traffic control. Fundamentals of geometric and pavement design. Influence of modern technologies on transportation systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 20900, CE 26400, CE 33200.

CE 33200 - Mechanics of Deformable Bodies

Stresses and strains in elastic and inelastic materials subjected to axial, torsional, and flexural loads and combinations of loads for statically determinate and indeterminate configurations. Deformations and deflections due to loads and temperature. Combined stresses. Mohr circles and principal stresses. Introduction to energy methods. Castigliano's theorem. Stability of columns and critical loads. Testing of engineering materials. Stress-strain characteristics, including creep, shrinkage and hysteresis effects. Effects of temperature and impact loading on material properties.

Credits: 4. Contact Hours: 3 class, 2 lab hr./wk. Prerequisite: CE 26400, CE 20900, CE 33200.

CE 33500 - Computational Methods in Civil Engineering

Algorithmic formulation of the solution to civil engineering problems. Flowcharts. Solutions to algebraic and differential equations common to civil engineering. Matrix problems. Differentiation and integration. Optimization problems. Students will primarily use microcomputers and a programming language, spreadsheets and "macros" and symbolic calculations software.

Credits: 3. Contact Hours: 2 class, 3 lab hr./wk. Prerequisite: CSC 10200, CE 26400, CE 33200, MATH 39100 (min. C grade); pre- or coreq.: MATH 39200.

CE 34000 - Structural Analysis

Loading systems. Structural determinacy, indeterminacy and stability. Analysis of two and three dimensional trusses and frames. Influence lines. Structural deflections. Methods of solving statically indeterminate structures. Introduction to structural safety and redundancy. Computer applications.

Credits: 3. Contact Hours: 2 class, 3 design hr./wk. Prerequisite: CE 20900, CE 33200; pre- or coreq.: CE 33500, MATH 39200.

CE 34500 - Soil Mechanics

Introduction to geotechnical engineering. Index properties and classification of soils. Compaction. Mohr circles and failure theories of soils. Permeability, seepage and effective stresses. Consolidation. Drained and undrained shear strength. Stresses due to surface loads. Bearing capacity of footings. Lateral earth pressure. Introduction to slope stability. Testing of soils.

Credits: 3. Contact Hours: 2 class, 3 lab hr./wk. Prerequisite: CE 26400, CE 33200, CE 35000 (min. C grade).

CE 35000 - Fluid Mechanics

Study of behavior of viscous and non-viscous fluids at rest and in motion through development and application of the principles of fluid statics, continuity, energy, momentum, similitude, and dimensional analysis. Applications include flow in open and closed conduits, the boundary layer, dynamics of drag and measurement of velocity and discharge.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 23100 (min. C grade), CSC 10200; pre- or coreq.: MATH 39100.

CE 36500 - Hydraulic Engineering

Conservation of mass, energy, and momentum in hydraulic systems. Pipe networks and reservoir systems. Pumps and turbines. Uniform and non-uniform flow principles. Hydraulic jump. Introduction to hydrology, hydrograph, peak discharges, and runoff computation and design. Computer applications in hydraulics and hydrology.

Credits: 3. Contact Hours: 2 class, 3 lab hr./wk. Prerequisite: For CE students: CE 35000 (min. C grade). For ESE students: choice of CE 35000 (min. C grade), ME 35600, or CHE 34100.

CE 37200 - Environmental Impact Assessment

The National Environmental Policy Act (NEPA) and the impact assessment of engineering projects on human and environmental health. Structure of the natural environment and pollutants typically released by engineering projects to the atmosphere, soil, and surface and ground water. Federal regulations. Modeling of the transport and transformation of pollutants in the environment using material balances, equilibrium chemistry and specialized models.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: For CE Students: CE 26400, CHEM 10401 (minimum grade of C), and CE 35000 (minimum grade of C). For ESE Students: CE 26400, CHEM 10401 (minimum grade of C), and choice of CE 35000, ME 35600, or CHE 34100.

CE 40100 - Review of Engineering Fundamentals

Review of core requirements including: engineering math, chemistry, computational methods, economics and ethics. Review of civil engineering fundamentals including statics, dynamics, strength of materials and fluid mechanics. General engineering fundamentals

including: Material science, thermodynamics and electrical circuits. Testing of student competence in all these topics. The course will be offered on a Pass/Fail basis.

Credits: 1. Contact Hours: 4.5 hr./wk for 10 weeks. Prerequisite: Upper junior or senior standing.

CE 40500 - Civil Engineering Management

Introduction to civil engineering management. Development of a project team for effective delivery; project delivery roles. Roles, rights and obligations of civil engineers. Ethical and professional responsibilities of civil engineers. Project life cycle analysis. Project costs and financing. Project administration; change orders, claims and dispute resolution. Group project.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 34000, CE 31600.

CE 43500 - Dynamics of Civil Engineering Systems

Kinematics and kinetics of particles. Work-energy and impulse momentum principles. Systems of particles. Kinematics of rigid bodies. Plane motion of rigid bodies. Introduction to vibration of structures: Free and forced vibration, undamped and damped motion. Response to harmonic and arbitrary loading. Earthquake response spectra. Equivalent lateral load analysis and design using Uniform Building Code criteria.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 33200, CE 33500, MATH 39200.

CE 44000 - Finite Element Analysis of Structures

Review of basic concepts of structural analysis. Energy methods. Stiffness & flexibility methods. Fundamentals of Finite Element Method. Uniaxial and beam elements. Analysis of trusses and frames. Plane stress and plane strain elements. Computer applications.

Credits: 3. Contact Hours: 2 class, 3 design hr./wk. Prerequisite: CE 33500, CE 34000, MATH 39200.

CE 44100 - Reinforced Concrete

Principles of reinforced concrete design. Proportioning concrete mixes. Safety factors as influenced by uncertainties in the design and construction processes and as they relate to public safety. Design of singly and doubly reinforced beams, T-beams, and one-way slabs. Cracking, deflection and serviceability criteria. Design of columns subjected to combined axial load and bending.

Credits: 3. Contact Hours: 2 class, 3 design hr./wk. Prerequisite: CE 26400, CE 34000.

CE 44200 - Structural Design

Analysis and design of beams, girders, tension and compression members, and other components of structural frames. Rational basis of safety factors and specifications and their public safety ramifications. Load and Resistance Factor Design.

Credits: 3. Contact Hours: 2 class, 3 design hr./wk. Prerequisite: CE 26400, CE 34000.

CE 45100 - Environmental Water Resources

Water and water pollution in the natural world. The hydrologic cycle. Atmospheric, surface and subsurface water. Hydrographs, unit hydrographs and flow routing. Mechanisms of contaminant transport. Sources and remediation of water pollution. Pollution in surface and groundwater. Design problems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 36500.

CE 47400 - Environmental Engineering

Physical, chemical and microbiological characterization of water, wastewater, air pollution and solid waste. Remediation objectives and regulatory constraints. Conventional unit operations and processes for potable water, domestic wastewater and air pollution control and solid waste management. Handling of process sidestreams.

Credits: 3. Contact Hours: 2 lect., 3 lab hr./wk. Prerequisite: CE 36500 and CE 37200.

CE 48200 - Water and Wastewater Treatment Design

Determination of design parameters and preliminary design of conventional water and wastewater treatment operations and processes using bench-scale experiments and commercially available computer software. The topics include aeration, sedimentation (flocculant and hindered), disinfection chemistry and kinetics, activated carbon adsorption for removal of soluble organics, precipitation and ion-exchange for hardness removal of domestic wastewaters.

Credits: 3. Contact Hours: 2 class, 3 design hr./wk. Prerequisite: CE 47400.

CE 50500 - Construction Project Management

Overview of the project management cycle; anatomy of a project from briefing and conception to commissioning and operations; phase out. Project funding and cash flow. Construction planning, project scheduling and site control. The construction management process; interactive roles of promoter, engineer/architect and builder/contractor. Computer applications using Primavera Project Planning software.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 33500.

CE 50900 - Senior Design Project

Major culminating design experience emphasizing multi- and interdisciplinary collaboration, and incorporating engineering standards and realistic constraints that include the following considerations: economic, financial, environmental, sustainability, constructability, ethical, health and safety, social and political.

Credits: 3. Contact Hours: 4 hr./wk.; Prerequisite: Senior standing; pre-/coreq.: CE 32600, CE 32700, CE 47400 and CE 44100.

CE 51000 - Independent Study

The student will pursue a program of independent study under the direction of a full-time faculty member of the department with the approval of the undergraduate advisor. The program may consist of an extensive design project, an experimental investigation, or an analytical study. A final engineering report describing the work done and the outcomes must be submitted to the Department at the end of the study.

Credits: 3. Prerequisite: Departmental approval.

CE 52000 - Traffic Engineering

Traffic flow theory, including fundamental diagram, microscopic models, and macroscopic models. Analysis of traffic data, including capacity and performance assessment. Network models and simulation. Advanced technology applications for data collection, traffic control, and real-time system management.

Credits: 3. Contact Hours: 3 hr./wk.

CE 52500 - Geometric Design of Facilities

Functional design of traffic facilities including plans and profiles, intersection and other interchange areas, parking, etc. Computer aided design methods and procedures using Eagle Point and PDS interfacing AUTOCAD.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 32700.

CE 52600 - Rail System Design

Design of light and heavy rail facilities for passenger and freight operations. Track structure. Alternative technologies for construction, guidance and communications. Maintenance of way.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 32700.

CE 53000 - Advanced Strength of Materials

Introduction to elements of elasticity including basic ideas of stress, strain, and constitutive relations. Theories of failure and fracture. Analysis of unsymmetrical bending. Shear center and shear flow. Torsion. Twisting of thin-walled sections. Buckling criteria.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 33200, CE 33500, MATH 39200.

CE 54000 - Highway Engineering

The design of highway alignment and route location. Basic elements of highway design, including pavement type, earthwork and drainage. Importance and consequences of maintenance and engineering economics; life-cycle cost analysis.

Credits: 3. Contact Hours: 3 hr./wk.

CE 54100 - Highway and Airport Construction

Overview of highway and airport engineering and construction; highways vs. airports; urban vs. rural highways. Construction planning, organization and cost estimating; construction scheduling using computer packages, e.g., Primavera; construction tracking. Construction operations: mobilization, removal, disposal, placement; management of equipment, material, labor, money; cash flow accounting. Construction specifications: quality assurance/quality control (QA/QC); investigation of environmental impacts and mitigation measures. Site investigation and project preparation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 32700 Corequisite: CE 32600

CE 54500 - Urban Transportation

Historical development of urban surface transportation systems. Stakeholders, user and operating characteristics, and infrastructure elements for passenger motor vehicle, transit, bicycle, pedestrian, and freight modes. Safety, environmental, and financial considerations. Regulations and technology applications

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 32600.

CE 54700 - Urban Freight and City Logistics

Core concepts, challenges and methods of urban freight and city logistics. Fundamentals of urban spatial structure, drivers of urban changes. Freight distribution methods and stakeholders. Externalities of freight operations. Urban freight data sources and data collection strategies. Policies and mitigation strategies, and analytical methodologies supporting decision-making. Illustrative case studies.

Credits: 3. Contact Hours: 3 hr./wk.

CE 54800 - Transit Systems: Planning and Operations

Basic techniques of service area analysis, route development, scheduling, revenue estimation, and service improvements for fixed route bus and rail transit. Integration of fixed route transit with paratransit, matching mode with service area, relationship of transportation department with other departments, budgeting, and policy setting also will be discussed.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 32600

CE 55000 - Advanced Reinforced Concrete

Mechanical properties of reinforced concrete materials including shrinkage, and creep. Ultimate load theory and ultimate strength design. Moment-curvature and load-deflection relationships. Columns subjected to biaxial bending. Combined shear and torsion. Design of flat plates and two-way slabs. Yield line theory.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 33500, CE 44100.

CE 56600 - Engineering Hydrology

Elements of hydrometeorology including climate tele-connections. Analyzing precipitation and using statistical methods. Design storm determination. Basin characteristics, runoffs and losses. Stream flow data, extension of data, overland flow, and design floods. Routing and unit hydrograph method. Sediments, their transport and deposition. Application of hydrologic design, Estimating evaporation, Groundwater flow modeling.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 36500.

CE 57100 - Water Quality Analysis

Acid-base titration curves and acid-base indicators, alkalinity and the carbonate system, buffer intensity and design, optical methods of analysis, the spectrophotometer and Beer's law, colorimetric analysis of phosphate, colorimetric analysis of ammonia, chelation analysis of iron, calcium carbonate equilibria, solubility product determination, Chemical Oxygen Demand, determination of forms of aqueous chlorine, reactions of aqueous chlorine with ammonia, adsorption on activated carbon, kinetics of ferrous iron oxidation.

Credits: 3. Contact Hours: 2 class, 2 lab hr./wk. Prerequisite: CE 47400.

CE 58300 - Air Pollution and Control

The effects of air pollution on humans and on the environment. The Clean Air Act and its Amendments. Mobile and industrial sources of air pollution and emission inventories of pollutants across the US and in NY. Pollution prevention vs. pollution control. Air pollution control from industrial, mobile and area sources, to meet needed removal efficiency, with an emphasis on control of gaseous and particulate air pollution from industrial sources.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 47400, MATH 39100.

CE 58400 - Solid Waste Management

Physical, chemical and biological characterization of municipal solid waste streams. Generation, transport (collection and distribution), handling and disposal of municipal solid waste streams. Technologies used in source and field separation of solid wastes. Disposal of source separated and commingled solid wastes. Terminal disposal of solid wastes - planning, design and operation of landfills and thermal conversion facilities. Generation and treatment of landfill leachates. Recycling of municipal solid wastes. Characterization and disposal of hazardous wastes. Required field trip.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 47400.

CE 59000 - Foundation Engineering

Soil exploration and sampling. Engineering properties of soils. Bearing capacity and settlement of foundations. Beams on elastic foundation. Design of footings and mats. Bearing capacity and settlement of piles and pile groups. Analysis of pile-raft foundations. Design of retaining structures. Slope stability.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CE 33500, CE 34500.

CE 59800 - Topics in Civil Engineering

Topics chosen for their particular or current interest to undergraduate students. Various courses designated CE 59800 and CE 59900 will be offered whenever there is sufficient student demand as evidenced by pre-registration forms or petitions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Departmental approval.

CE 59900 - Topics in Civil Engineering Design

Topics chosen for their particular or current interest to undergraduate students. Various courses designated CE 59800 and CE 59900 will be offered whenever there is sufficient student demand as evidenced by pre-registration forms or petitions.

Credits: 3. Contact Hours: 2 class, 3 design hr./wk. Prerequisite: Departmental approval.

CHE - Chemical Engineering Course Descriptions

CHE 22800 - Introduction to Chemical Engineering Principles and Practices

Introduction to the techniques of chemical engineering. Basic calculations. Conservation of mass and the use of material balances. Major equipment types: functionality and linear models. Linear material

balances for recycle processes. First law of thermodynamics and the use of energy balances. Reaction stoichiometry and energetics. A laboratory component brings above concepts to a process system; a computational laboratory component emphasizes modeling of system dynamics for steady, transient, pure component, mixture, and reactive systems.

Credits: 5. Contact Hours: 3 lect., 4 lab hr./wk. Prerequisite: CHEM 10401; pre- or coreq.: MATH 20300.

CHE 22900 - Chemical Engineering Thermodynamics I

Basic concepts and definitions. Energy and the first law. Entropy and the second law. Pure component thermodynamics and the fundamental property relation. Thermodynamics of processes. Availability. Physical Equilibrium. Introduction to microscopic thermodynamics. The third law.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 10401, PHYS 20700, MATH 39100.

CHE 31000 - Introduction to Materials Science

Basic concepts in the behavior of solid materials. Atomic bonding; crystal structure; crystal defects; alloys; insulators; metals. Mechanisms of corrosion; selection of materials of construction.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 22900; pre- or coreq.: CHE 34100.

CHE 33000 - Chemical Engineering Thermodynamics II

Partial molar quantities. Thermodynamics of solutions. Activities and fugacities. Modeling of thermodynamic parameters. Chemical reaction equilibrium. The free energy minimization procedure for complex chemical reactions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 22900, MATH 39100.; Pre/Coreq: CHE 22800 & PHYS 20800.

CHE 34100 - Transport Phenomena I

Introduction to the continuum theories of the transport of momentum, energy, and matter. Equations of continuity, motion, and energy for steady and unsteady state. Fluid mechanics, Navier-Stokes equations, boundary-layer theory, integral methods. Turbulent flow.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 22900, MATH 39100.

CHE 34200 - Transport Phenomena II

Applications of the equations of change to heat and mass transport. Analytical and numerical methods in the analysis of heat conduction. Diffusion in binary and multicomponent mixtures. Heat and mass transfer in laminar and turbulent flow. Radiant heat transfer. Interphase transfer.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 34100, MATH 39200.

CHE 34500 - Separations Operations

Principles of single-stage and multi-stage contacting equipment. Phase equilibrium and phase diagrams. Analytical and graphical solutions to steady and unsteady state problems applied to liquid extraction, distillation, gas absorption, stripping, and other stage operations for binary and multicomponent systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 22800; pre- or coreq.: CHE 33000; CHE 34200.

CHE 34600 - Transport Operations

Flow through pipes, packed and fluidized beds, and filtration equipment. Design of flow systems with non-Newtonian fluids and compressible flows. Design of continuous contacting equipment for heat and mass transfer; heat exchangers, packed towers. Laboratory component emphasizes the performance or experiments in the topics listed above, analysis of the experimental data including its statistical reliability and comparison against standard models.

Credits: 4. Contact Hours: 3 lect., 3 lab hr./wk. Prerequisite: CHE 34100; pre- or coreq.: CHE 34200.

CHE 43200 - Chemical Reaction Engineering

Reaction kinetics, order of reaction, theory of absolute reaction rates. Reactor analysis and design, homogeneous batch, flow, and semibatch reactors. Catalysis, reactions of heterogeneous systems, heat- and mass-transfer effects. Examples from chemical and petrochemical industries.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 34200, CHE 33000.

CHE 45200 - Powder Science and Technology

Characterization of particles and particle assemblies; packing of granular solids; powder mechanics and the design of hoppers; inter-particle forces and tribology in particulate systems. Bulk powder processing: mixing, separation, agglomeration, comminution, conveying and storing.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 34200, CHE 34600.

CHE 46200 - Unit Operations and Process Control Laboratory II

Diffusional processes; absorption, distillation, drying, advanced heat transfer; process control. Reports emphasize proper presentation and interpretation of laboratory data.

Credits: 2. Contact Hours: 5 lab hr./wk. Prerequisite: CHE 34500, CHE 34600

CHE 46700 - Polymer Science and Engineering

The chemistry and physics of polymeric materials. The kinetics and control of polymerization reactions. Analysis of the mechanical and flow behavior of polymeric solids and melts. Thermodynamics of polymer solutions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 33000 and CHE 26300.

CHE 47900 - Process Control

Process dynamics and modeling. Measurement instrumentation, final control elements, and controllers. Linearization, Laplace transforms, and transfer functions. Frequency response. Stability analysis. Design of single-input, single-output controllers. Dynamic simulation. Interaction and multivariable control. Plant-wide control.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 34500, CHE 34600; pre- or coreq.: CHE 43200.

CHE 49500 - Techniques of Chemical Engineering Design

Cost estimation and profitability analysis. Douglas' hierarchical decision approach to conceptual design. Economic evaluation of process alternatives. Flowsheet simulation using ASPEN. Process operability analysis of the impact of control strategy, hazard and safety considerations, environmental constraints, and startup and operations on plant design.

Credits: 3. Contact Hours: 4 design hr./wk. Prerequisite: CHE 22800, CHE 33000, CHE 34500, CHE 34600; pre- or coreq.: CHE 43200, CHE 47900.

CHE 49600 - Chemical Engineering Design Project

Design of a chemical plant as the capstone design project. Students select process routes for the manufacture of a designated product and carry the design from the conceptual stage through a developmental design and an operability analysis. CAD. Professional ethics.

Credits: 3. Contact Hours: 4 design hr./wk. Prerequisite: CHE 43200, CHE 47900, CHE 49500.

CHE 49803 - Honors Research in Chemical Engineering I

Topics chosen for their particular or current interest to undergraduate students who wish to prepare for graduate studies. Each student works with a single professor.

Credits: 3. Prerequisite: Approval of the department.

CHE 49808 - Nanomaterials

Basic concepts and definitions of nanomaterials. Synthesis of nanoparticles and carbon nanotubes. Properties of nanomaterials based on quantum-confinement and surface-to-volume ratio. Scanning and electron probe technology for nanomaterials characterization. Application of nanomaterials. Societal impact of nanotechnology.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 10301, PHYS 20800.

CHE 49903 - Honors Research in Chemical Engineering II

A continuation of CHE 49803.

Credits: 3. Prerequisite: Approval of the department.

CHE 51200 - Pharmaceutical Applications of Chemical Engineering

Topics in controlled drug delivery: design of devices, commercial successes and failures, mechanisms of release devices as well as relevant background in mass transfer, structure and design of materials, electrical devices, and pharmacokinetics are also addressed.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 34100.

CHE 58000 - Bioprocess Engineering

Introduction to the production of chemicals by microorganisms. Basics of biochemistry and cell structure with emphasis on prokaryotic microbes. Enzymes and their biotechnological uses. Introduction to recombinant DNA technology and genomics. Operation, design and scale-up of bioreactors. Selection, design and scale-up of separation and purification equipment. Safety considerations.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 34500, CHE 34600, CHEM 26100; Pre- or coreq.: CHE 49500

CHE 59000 - Nanotechnology

Introduction to nanotechnology and its applications in the development and synthesis of soft materials.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 33000, CHE 34600, CHEM 33200.

CHE 59812 - Energy Systems Engineering for Global Sustainability

This course is intended to provide students with the background and tools to analyze energy choices for the future. World energy supplies, demand, and trends. The politics of energy. The scientific basis for anthropogenic global warming and its impact on climate and planetary ecosystems. Characterization and analysis of conventional sources of energy and fuels production including combined-cycle systems from both thermodynamic and environmental points of view. Alternate sources of power including nuclear, wind farms, solar (both photovoltaic and thermal), and biomass. Energy consumption by the transportation, manufacturing, and space heating and cooling segments of the economy. Societal barriers such as denial, lock-in, and NIMBY.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHE 22900 or ENGR 23000 or CHEM 33000.

CHEM - Chemistry Course Descriptions

Students may register for CHEM 10301 if eligible for Calculus on the basis of mathematics placement test scores or completion of MATH 19500. All others are required to take CHEM 10100 (Introduction to Chemistry) prior to 10301.

CHEM 10000 - Chemistry and Society

The fundamental principles of chemistry and their application to social issues. (Not Open to Science majors).

Credits: 3. Contact Hours: 3 hr./wk.

CHEM 10100 - Introduction to Chemistry

(For students with limited background in mathematics or the physical sciences.) Problem-solving in chemistry: introduction to chemical and physical concepts.

Credits: 1. Contact Hours: 3 hr./wk. Prerequisite: C grade in MATH 19500; Corequisite: MATH 19500.

CHEM 10300 - General Chemistry I

(For students majoring in science or engineering.)

Credits: 3. Contact Hours: 4 hr./wk.

CHEM 10301 - General Chemistry I

This is the first semester of a two-semester general chemistry course-sequence. An in-depth introduction to the fundamental laws and techniques of chemistry for majors in science and engineering. Topics include: measurement; stoichiometry; the gaseous state; thermochemistry; atomic structure and chemical bonding; redox reactions; solids, liquids and intermolecular forces. Materials fee: \$30.

Credits: 4. Contact Hours: 3 lect., 2 lab, 2 workshop hr./wk. Prerequisite: Grade of C or better in MATH 19500 or placement by the department

CHEM 10400 - General Chemistry II

(For students majoring in science or engineering.)

Credits: 3. Contact Hours: 4 hr./wk

CHEM 10401 - General Chemistry II

This is the second semester of a two-semester general chemistry course-sequence. An in-depth introduction to the fundamental laws and techniques of chemistry for majors in science and engineering. Topics include: chemical kinetics; chemical equilibrium; acids and bases; free energy, entropy and the second law of thermodynamics; electrochemistry; advanced bonding concepts; metals and coordination chemistry; and nuclear chemistry. Materials fee: \$30.

Credits: 4. Contact Hours: 3 lect., 3 lab., 1 workshop hr./wk. Prerequisite: Grade of C or higher in CHEM 10301 or placement by the department.

CHEM 11000 - Exploring Chemistry

Credits: 3. Contact Hours: 3

CHEM 21000 - Applied Chemistry for Biomedical Engineers

Introduces students to organic chemistry and biochemistry principles relevant to the study of the human body. Topics covered include: hydrocarbons; functional groups; and structure and function of biomolecules (lipids, carbohydrates, proteins, and nucleic acids), along with their interactions; and introduction to molecular genetics.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 10401 (min. C grade).

CHEM 24300 - Quantitative Analysis

Volumetric, spectrophotometric and electrometric analyses. Materials fee: \$30.

Credits: 4. Contact Hours: 3 lect., 4 lab., hr./wk. Prerequisite: Grade of C or higher in CHEM 10401 or placement by the department.

CHEM 26100 - Organic Chemistry I

An introduction to the chemistry of carbon compounds, current interpretation of the reactions and properties of these compounds.

Credits: 3. Contact Hours: 3 lect., 1 rec., hr./wk. Prerequisite: Grade of C or higher in CHEM 10401 or placement by the department.

CHEM 26200 - Organic Chemistry Laboratory I

Materials fee: \$30.

Credits: 2. Contact Hours: 3 lect., 1 rec., 4 hr./wk. Prerequisite: Grade of C or higher in CHEM 26100 or placement by the department. Corequisite: CHEM 26300.

CHEM 26300 - Organic Chemistry II

A continuation of CHEM 26100.

Credits: 3. Contact Hours: 3 lect., 1 rec. hr./wk. Prerequisite: Grade of C or better in CHEM 26100 or placement by the department.

CHEM 27200 - Organic Chemistry Laboratory I

(For Chemistry majors). Exercises stressing the techniques involved in the preparation, isolation, purification, and analysis of carbon compounds. Materials fee: \$30.

Credits: 3. Contact Hours: 6 hr./wk. Prerequisite: Grade of C or higher in CHEM 26100 or placement by the department. Corequisite: CHEM 26300.

CHEM 30100-30400 - Honors

Students are provided the opportunity to do individual laboratory research under the direction of a member of the faculty which culminates in a term paper. A GPA of 3.0 in chemistry courses is required. Approval of Department Undergraduate Research Supervisor required prior to registration.

Credits: 3. Contact Hours: 3 cr./sem.

CHEM 31001-31004 - Independent Study

Students are provided the opportunity to do individual library, special project or laboratory research under the direction of a member of the faculty which culminates in a term paper. A GPA of 2.5 in chemistry courses is required. Approval of Department Undergraduate Research Supervisor required prior to registration.

Credits: 1-4. Contact Hours: 1-4 cr./sem.

CHEM 31100-32000 - Selected Topics in Chemistry

Special topics not covered in the usual department offerings. Topics will vary from semester to semester depending on student and instructor interest.

Credits: Determined by instructor. Contact Hours: Credits and hours to be determined by instructor and department with a maximum of 4 cr. per course.

CHEM 31606 - Gen Chem For Engrns

Credits: 3. Contact Hours: 3

CHEM 32002 - Biochemistry I

This is the first semester of a two-semester Biochemistry course sequence. The course covers the cellular biochemistry of amino acids, proteins, carbohydrates, lipids and nucleic acids, in depth.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Grade of C or better in CHEM 26100 and CHEM 26300 or placement by the department.

CHEM 32004 - Biochemistry Laboratory I

Chromatography, electrophoresis, spectroscopy, and other quantitative laboratory techniques will be applied to the isolation and analysis of amino acids, proteins, enzymes, carbohydrates, lipids, and nucleic acids. Materials fee: \$30

Credits: 2. Contact Hours: 4 hr./wk. Prerequisite: Grade of C or better in CHEM 26300 or placement by the department.

CHEM 33000 - Physical Chemistry I

Ideal and real gases, kinetic molecular theory, thermodynamics and phase equilibria, solutions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Grade of C or higher in CHEM 10401, MATH 20300, and PHYS 20700 or placement by the department. Corequisite: PHYS 20800 (recommended as a prereq.).

Students who feel that they would benefit from workshops should also take CHEM 33001.

CHEM 33001 - Physical Chemistry I Workshop

(Optional workshop).

Credits: 0. Contact Hours: 2 hr./wk. Corequisite: CHEM 33000.

CHEM 33100 - Physical Chemistry Laboratory I

Vapor pressures; phase diagram; combustion calorimetry; gas viscosities; electrochemical determination of thermodynamic quantities and other experiments based on topics covered in CHEM 33000. Materials fee: \$30.

Credits: 2. Contact Hours: 5 hr./wk. Prerequisite: CHEM 24300; pre-or coreq: CHEM 33000. Offered: Spring Semester only..

CHEM 33200 - Physical Chemistry II

Spectroscopy, quantum mechanics, and statistical thermodynamics. Students who feel that they would benefit from workshops should also take CHEM 33201.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 33000 or (CHE 22900 and CHE 33000). MATH 39100 is highly recommended.

CHEM 33201 - Physical Chemistry II Workshop

(Optional workshop)

Credits: 0. Contact Hours: 2 hr./wk. Corequisite: CHEM 33200.

CHEM 33500 - Physical Biochemistry

(For students taking the biochemistry option) Thermodynamics, kinetics, transport, spectroscopy, solids, surface and electrochemistry as applied to biological systems.

Credits: 5. Contact Hours: 8 hours

CHEM 37400 - Organic Chemistry Laboratory II

A continuation of CHEM 27200 stressing qualitative organic analysis. Materials fee: \$30.

Credits: 3. Contact Hours: 6 hr./wk. Prerequisite: CHEM 27200 or (the discretion of the chair) and CHEM 26300.

CHEM 38200 - Chemistry-Physics-Engineering Seminar I

Required for certain undergraduate students; emphasis on topics in physical, organic and inorganic chemistry.

Credits: 1. Offered: Fall semester only..

CHEM 38300 - Chemistry-Physics-Engineering Seminar II

Required for certain undergraduate students; emphasis on topics in physical, organic and inorganic chemistry.

Credits: 1. Offered: Spring semester only..

CHEM 40300 - Chemical Information Sources

An introduction to the retrieval of chemical information. Topics covered: primary, secondary and tertiary literature, including the major abstract journals, data sources, compendia, patents, current awareness, and computer readable sources.

Credits: 1. Contact Hours: 1 hr./wk. Prerequisite: CHEM 10401 and CHEM 26100. Offered: Spring semester only..

CHEM 40500 - Safety in Chemistry

Laboratory and plant safety and toxicology; safety regulations.

Credits: 1. Contact Hours: 1 hr./wk. Prerequisite: CHEM 10401 and CHEM 26100. Offered: Spring semester only..

CHEM 40600 - Environmental Chemistry

Chemical cycles, aquatic chemistry and microbial biochemistry, phase interactions, water pollution and treatment, atmospheric chemistry and pollution, geochemistry, soil chemistry, energy resources, hazardous

wastes, toxicological chemistry, and analytical methods. Intended to broaden the students' understanding of chemical processes taking place in our environment. The relationship between atmospheric, soil and water chemistry will be underlined. This course draws upon general, analytical and organic chemistry experience.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 24300 and CHEM 26100.

CHEM 40601 - Environmental Chemistry Laboratory

Introduction to environmental analysis. Samples of water, air, soil, food, etc. will be obtained and analyzed both qualitatively and quantitatively for pollutants. The effects of these pollutants on the environment will be discussed and linked to urban problems. Analytical techniques will include titrations, separations (GC, HPLC, GC/MS), and polarography. Materials fee: \$30.

Credits: 2. Contact Hours: 4 hr./wk. Prerequisite: CHEM 40600.

CHEM 40700 - Environmental Organic Chemistry

An examination of processes that affect the behavior and fate of anthropogenic organic contaminants in aquatic environments. Students learn to predict chemical properties that are influencing the transfers between hydrophobic organic chemicals, air, water, sediments and biota. This knowledge will be based on a fundamental understanding of intermolecular interactions and thermodynamic principles. Mechanisms of important thermochemical, photochemical, and biochemical transformation reactions are also investigated, leading to the development of techniques (such as structure-reactivity relationships) for assessing environmental fate or human exposure potential.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 26100.

CHEM 42500 - Inorganic Chemistry

Concepts of inorganic chemistry including bonding theory, structure of complexes, symmetry, and reaction mechanisms.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 26100, CHEM 26300, CHEM 33000; pre- or coreq: CHEM 33200 or CHEM 33500 recommended.

CHEM 43400 - Physical Chemistry and Chemical Instrumentation Laboratory II

This course will introduce students to experimental methods in physical chemistry, instrumental analysis and the principles and applications of chemical instrumentation. The course will acquaint the student with the behavior of real chemical systems, the theory of the chemical phenomenon under observation and the design and methodology of measurement systems to detect the chemical phenomenon.

Credits: 3. Contact Hours: 1 lect., 5 lab. hr./wk. Prerequisite: CHEM 33100; pre or coreq: CHEM 33200. Offered: Fall semester only..

CHEM 43500 - Physical Biochemistry

(For students taking the biochemistry concentration) Thermodynamics, kinetics, transport, spectroscopy, solids, surface and electrochemistry as applied to biological systems.

Credits: 5. Contact Hours: 3 lect., 1 rec., 4 lab. hr./wk. Prerequisite: CHEM 24300, CHEM 26300, CHEM 33000, CHEM 32002. Offered: Spring semester only..

CHEM 45902 - Intr Biochemistry

This is the first semester of a two-semester Biochemistry course sequence. The course covers the cellular biochemistry of amino acids, proteins, enzymes, carbohydrates, lipids, and nucleic acids, in depth.

Credits: 3. Contact Hours: 3 hours

CHEM 45904 - Biochemistry Lab

The laboratory exercises include chromatography, electrophoresis, spectroscopy, and other quantitative laboratory techniques that are applied to the isolation and analysis of amino acids, proteins, carbohydrates, lipids, and nucleic acids.

Credits: 2. Contact Hours: 4 hours

CHEM 48005 - Biochemistry II

Molecular basis of enzyme action, membranes (transport and transduction), protein structure, signal transduction, virology, bioinformatics, genomics, proteomics, molecular basis of replication, transcription and translation of genetic information, and immunology.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 45902. Offered: Spring semester only..

CHEM 58208 - RNA Biochemistry and Molecular Biology

Chemistry, structure and function of the ribonucleic acids (RNA), and the increasingly important role this ancient biopolymer is recognized to play in Biochemistry and other life sciences, including medicine. Theoretical and methodological concepts will be explored in lectures and in class discussion of classic and contemporary RNA research papers.

Credits: 3. Contact Hours: 3 hours /week Prerequisite: A minimum grade of C in CHEM 32002 and CHEM 48005, or equivalents.

CHIN - Chinese Course Descriptions

CHIN 12300 - Introductory Chinese (Mandarin) I

An introduction to modern vernacular Chinese based on the speech of Beijing. Essentials of sound patterns, grammar and vocabulary. Practice in speaking, reading and dictation in class and at the Language Media Center.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

CHIN 12400 - Introductory Chinese (Mandarin) II

A continuation of CHIN 12300 including further practice in modern vernacular Chinese based on the speech of Beijing. Essentials of sound patterns, grammar and vocabulary. Practice in speaking, reading and dictation in class and at the Language Media Center.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: CHIN 12300 or permission of the instructor.

CHIN 22600 - Intensive Intermediate Chinese

An intermediate course that will build on the skills acquired in basic CHIN 12300 and CHIN 12400 with increased emphasis on reading and writing from modern sources in addition to aural/oral proficiency.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: CHIN 12400 or placement exam.

CHIN 30500 - Conversational Chinese

Presents rotating, semester-long topics that provide practice in speaking and listening skills in Chinese. Involves intensive practice of the spoken language, especially aural comprehension, oral production, correct pronunciation, and idiomatic speech. Students will build up vocabulary and sentence patterns in communicative contexts and develop their ability to carry out conversations in Chinese on a range of topics. Reading and writing (using simplified characters) will be brought out in conjunction with speaking and listening skills.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHIN 22600 or placement by examination.

CL - Comparative Literature Course Descriptions

CL 28000 - Introduction to Comparative Literature

Study of major themes, genres, and periods. Basic introduction to ways of comparing various literatures and to the relations between literature

and other art forms. Readings from world literature (in translation, as necessary) and from secondary sources.

Credits: 3. Contact Hours: 3 hr./wk.

CL 31100-32000 - Selected Topics in Comparative Literature

A changing series of innovative and experimental cases on topics not generally covered in regular courses. Students should consult the list of course offerings each semester to determine which selected topic will be offered.

Credits: 3. Contact Hours: 3 hr./wk.

CL 35100 - Introduction to Comparative Literature II

This course is a continuation of CL 35000, Introduction to Comparative Literature. It begins in the early modern period with English and French drama and then the eighteenth-century enlightened novel. The course will examine nineteenth-century romantic literature with themes of the new cult of feeling, authenticity, and the problem of conscience in an age of ideology. The course concludes with twentieth-century modernism. Students will study a variety of primary texts from across the world with secondary assignments when appropriate and relate them to other art forms and historical developments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CL 35000, enrollment in Hertog Scholars Program.

CL 41100-42000 - Seminars in Comparative Literature

Intensive study of a particular period, theme, genre, or literary movement, or of a particular problem in the theory and methods of comparative literature.

Credits: 3. Contact Hours: 2 hr./wk. Prerequisite: CL 35000 or approval of the instructor.

CLSS - Classical Culture Course Descriptions

No knowledge of Greek or Latin is required for these courses.

CLSS 12100 - Greek and Latin Roots in the English Language

A practical analysis of Greek and Latin stems, prefixes and suffixes and their functions in various types of English vocabulary.

Credits: 3. Contact Hours: 3 hr./wk.

CLSS 32100 - Classical Mythology

Greek and Roman myths, their connections with religion, the ancient sources, and the survival and reinterpretation of classical myth in subsequent literature and film up to the present day.

Credits: 3. Contact Hours: 3 hr./wk.

CLSS 32300 - Greek and Roman Comedy and Satire in Translation

Selections from Aristophanes, Menander, Plautus, Terence, Horace, Juvenal, Martial, and Lucian. The comic and satiric spirit; the classical forms and their modern counterparts.

Credits: 3. Contact Hours: 3 hr./wk.

CLSS 33100 - Latin Literature in Translation

The principal literary works of ancient Rome, studied both in their historical settings and as contributions to the development of modern literature.

Credits: 3. Contact Hours: 3 hr./wk.

CLSS 34100 - Science in Antiquity

The origins of Greek scientific thought; its substantive achievements in Mathematics, Astronomy, Physical and Biological Sciences, Technology, and Medicine; its social and cultural relations; its impact upon subsequent ages.

Credits: 3. Contact Hours: 3 hr./wk.

CLSS 40100 - Modern Problems in Perspective

Problems of the individual and society as they appear in the general cultural tradition, particularly in the literature of the ancient Greek, Hebrew, and Roman civilizations. Problems selected according to the interests of faculty members and students.

Credits: 3. Contact Hours: 3 hr./wk.

CLSS 40103 - Women in Antiquity

From prostitutes to priestesses and even prophets, women played a variety of roles in the cultures of antiquity. In this course, we will study their lives and men's perceptions of them through both literary and visual remains. An exploration of the role of women in the development of Christianity and the ways in which Christianity affected expectations and opportunities for both sexes will also be explored.

Credits: 3. Contact Hours: 3 hr./wk.

CSC - Computer Science Course Descriptions

CSC 10000 - Introduction to Programming and Computer Science

A breadth-first introduction to computer programming and computer science. Elementary programming in a modern object-oriented language such as C++ or Java; introduction to algorithms; brief overview of operating systems, computer networks, and databases; introduction to artificial intelligence.

Credits: 3. Contact Hours: 4 hr./wk.

CSC 10200 - Introduction for Computing

The structure and operation of a computer, concepts, and properties of algorithms and a programming language. Introduction to programming in a modern programming language, such as C/C++. The emphasis is on applications of interest to scientists and engineers.

Credits: 3. Contact Hours: 2 class, 2 rec. hr./wk. Prerequisite: MATH 19500 (min C grade) or pre/coreq.: MATH 20100 (min C grade).

CSC 10300 - Introduction to Computing for Majors

The structure and operation of a computer; concepts and properties of an algorithm and a programming language. Introduction to procedural programming in a modern programming language, such as C/C++, control structures, functions, recursion, arrays, pointers, strings, structures, and file I/O.

Credits: 3. Contact Hours: 2 class, 2 rec. hr./wk. Prerequisite: MATH 19500 (min. C grade). or Prereq/Co-req Math 20100 (min. C grade)

CSC 10400 - Discrete Mathematical Structures

Introduction to the mathematics fundamental to all phases of computer science, from the formulation of problems to the understanding of their underlying structure, to the comparative analysis of the complexity of algorithms that can be used to solve these problems. The course introduces combinatorics, first-order logic, induction, set theory, relations and functions, graphs, and trees.

Credits: 4. Contact Hours: 3 class, 2 rec. hr./wk. Prerequisite: MATH 20100 (min. C grade).

CSC 11300 - Programming Language

This course is to develop understanding and fluency of a current programming language; topics include basic programming concepts, data representation, functions, control structures, error handling and exceptions, testing and debugging, type safety, classes and principles of object-oriented programming. A series of laboratory-oriented programming projects is an essential component of the course.

Credits: 1. Contact Hours: 1hr./wk. Prerequisite: CSC 10300 or departmental permission.

CSC 21000 - Computers and Assembly Language Programming

Computer structure, machine representation of data, addressing and indexing, computation and control instructions, assembly language and assemblers; procedures (subroutines) and data segments, linkages and subroutine calling conventions, loaders; practical use of an assembly language for computer implementation of illustrative examples.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 10300.

CSC 21100 - Fundamentals of Computer Systems

Fundamentals of computer organization and digital logic. Boolean algebra, number systems and codes, combinational logic design principles, basic gates and components, flipflops and latches, counters and state machines. Assembly language and assemblers; procedures and data segments, linkages and subroutine calling conventions, loaders; practical use of an assembly language.

Credits: 3. Contact Hours: 2 lect., 2 lab. hr./wk. Prerequisite: CSC 10300.

Computer Engineering students who have completed CSC 21000 and EE 21000 are considered to have met the requirements of equivalency to CSC 21100. CSC 21100: Fundamentals of Computer Systems

CSC 21200 - Data Structures

Extension of the knowledge of algorithm design and programming gained in CSC 10300 with continued emphasis on the logic underlying the transition from specification to program. Particular attention is paid to issues arising in the implementation of larger programs: introduction of data structures and data abstraction; the basics of object-oriented programming. Introduction of recursion as a design tool. Introduction of complexity analysis.

Credits: 3. Contact Hours: 2 class, 2 rec. hr./wk. Prerequisite: CSC 10300 and CSC 10400.

CSC 21700 - Probability and Statistics for Computer Science

Overview of applicable discrete and stochastic foundations: combinatorics, probability, and Monte Carlo methods. Descriptive statistics for data analysis. Random variables, mathematical expectation. Study of the constant density and random number generator, normal, exponential, as well as Bernoulli, Binomial and Poisson distributions. Limit theorems and sample statistics. Foundations of discrete event simulation, computational examples.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 10300, CSC 10400, and MATH 20100 (min. C grade).

CSC 22000 - Algorithms

Measuring algorithmic complexity (O-Notation); searching and sorting algorithms and their complexity; tree and graph algorithms and their complexity; classes of algorithms, such as divide-and-conquer, backtracking, greedy, probabilistic, etc. Computational complexity; the classes P and NP.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 21200.

CSC 22100 - Software Design Laboratory

Object-oriented programming in a software engineering context. Design patterns. Event-driven programming. Building an application with a graphical user interface: specifications; design; programming; accessing a database with a java program; unit and user testing. Projects done in teams; oral and written presentations.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 21200 and ENGL 21007, or ENGL 21001 or ENGL 21002 or ENGL 21003.

CSC 30100 - Numerical Issues in Scientific Programming

Numerical issues: roundoff error, truncation error, overflow and underflow errors. Numerical integration; solution of simultaneous equations; curve fitting. A thorough introduction to scientific programming, using a modern version of the Fortran or Matlab language. Written reports and oral presentation of projects.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 21700, CSC 22000, MATH 20300 (min. C grade) and MATH 34600 (min. C grade).

CSC 30400 - Introduction to Theoretical Computer Science

Finite state automata, pushdown automata, Turing Machines, and the languages they can recognize. Church's Thesis. Compatibility. The classes P and NP; NP-complete problems and intractable problems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 22000.

CSC 31700 - Introduction to the Internet

This course is intended to provide students with the background necessary for understanding the Internet. Discussed are the underlying technology, applications, and social implications of the World Wide Web. Cannot be used to fulfill CSC technical elective requirement.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 10200 or CSC 10300 and at least junior standing.

CSC 31800 - Internet Programming

This course provides advanced CSC/engineering majors with an understanding of web-based application development.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 22100 or EE 25900.

CSC 32200 - Software Engineering

The software development life cycle from feasibility study to turnover to client. Documentation of design, program, and training materials. Rapid prototyping languages. Software development management: team roles and organization, the version control problem, maintenance issues. Use of CASE tools emphasized and illustrated in projects. Written reports and oral presentation of projects.

Credits: 4. Contact Hours: 3 class, 2 lab hr./wk. Prerequisite: CSC 22000 and CSC 22100.

CSC 33200 - Operating Systems

Overview of computer organization. Interrupts. Operating systems objectives and functions. Hardware protection mechanisms, dual mode operation. System calls. The evolution of operating systems. Process representation and control. Uniprocessor scheduling. Process synchronization: critical section problem, synchronization mechanisms, algorithms, language constructs, classical synchronization problems: issues of safety, liveness, and fairness. Deadlocks. Memory management and virtual memory. File management. I/O management and disk scheduling. In laboratory sessions students will study and implement programming projects that illustrate the concepts introduced in the lectures.

Credits: 4. Contact Hours: 3 lect. hr., 2 lab hrs./wk. Prerequisite: CSC 22000 and (CSC 21700 or EE 31100).

CSC 33500 - Programming Language Paradigms

Aspects of the design and implementation of declarative and imperative programming languages, presented via a sequence of interpreters. Topics include abstraction, objects and inheritance, parameter passing, type-checking and continuations. Substantial programming assignments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 22000 and CSC 22100.

CSC 33600 - Introduction to Database Systems

An introduction to database architecture. Levels of abstraction in a database system; physical database organization: abstract data models; relational databases and their query languages. Database design assignments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 22000 and CSC 22100.

CSC 34200 - Computer Organization

This course provides computer science and computer engineering students with an in-depth look at computer architecture and the

hardware/software interface. The major topics are: computer abstractions and technology; the role of performance and measuring performance; SPEC. computer arithmetic; machine language: a comparative analysis of instruction sets of current processors using debuggers, simulators and by the partial reverse engineering of executables. The processor: datapath and control; RISC versus CISC; design, implementation (using VHDL), and verification (in simulation) of a simplified RISC processor using CAD tools. Enhancing performance with pipelining. Memory hierarchy, cache, virtual memory, performance issues. interfacing processors and peripherals; PCI chipset. Overview of multiprocessors, grid computing.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 21100 or (CSC 21000 and EE 21000). Corequisite: CSC 34300.

CSC 34300 - Computer Systems Design Laboratory

Introduction to FPLD technology, logic synthesis, and rapid prototyping of digital systems using commercial CAD tools. Topics: Programmable Logic Technology. Sequential Design and Hierarchy. Synthesis of Digital Hardware using VHDL. State Machine Design, CPU Controller. A Simple Processor Design. Video Graphics Adapter (VGA) video display generation. Design PS/2 Keyboard interface. Design of PS/2 Mouse interface. Synthesis of a RISC processor as covered in CSC 34200. Students are required to prepare written reports and demonstrate their design.

Credits: 1. Contact Hours: 3 hr./wk. Corequisite: CSC 34200.

CSC 37500 - Social Issues in Computing

A systematic and comprehensive overview of the social implications of computers. Public policy questions and the responsibility of computer professionals will be stressed. Topics include computers in the economy, in politics and government, in social institutions and in contemporary culture.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: At least sophomore standing.

CSC 41200 - Computer Networks

Layer approach to understanding networks using the ISO model: physical layer, data link layer, network layer, and, as time permits, the transport, session, presentation, and application layers.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 33200.

CSC 42000 - Compiler Construction

Formal description of programming languages and techniques used in their compilation. Study of syntax, semantics, ambiguities, procedures replication, iteration, and recursion in these languages. Syntactic decomposition and the theory of compilers that are syntax-directed or recursively controlled.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 30400.

CSC 42200 - Computability

Shepherdson-Sturgis machines. Elements of recursive function theory. The equivalence of the class of computable and recursive functions. Church's thesis; other models of computation: Post machines, Turing machines, semi-Thue systems, etc. Unsolvable problems and introduction to their classification. Subrecursive formalism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 22000, CSC 30400, and (CSC 21700 or EE 31100).

CSC 42800 - Formal Languages and Automata

Classes of languages; their description in terms of grammars and their recognition by automata. The Chomsky hierarchy; regular, context-free, context-sensitive and recursively enumerable languages. Application to parsing and compiler construction.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 30400.

CSC 43000 - Distributed Computing

Basic model of distributed computing. Asynchronous and synchronous message passing. Algorithms for distributed termination detection and their correctness proofs. The correctness requirements of safety, liveness, and fairness in distributed computations. Synchronization algorithms. Communicating Sequential Processes. Higher level language constructs for synchronization algorithms. Verification methods. Several seemingly correct but actually incorrect algorithms will be shown for the above problems to appreciate the subtle correctness problems in distributed algorithms.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 33200.

CSC 43500 - Concurrency in Operating Systems

Mutual exclusion-software and hardware approaches. The correctness requirements of safety, liveness, and fairness. Semaphores, monitors and other concurrent programming constructs. Classical synchronization problems. Axiomatic verification of concurrent algorithms. Models of distributed computation. Distributed termination detection. Time clocks, and ordering of events. Distributed Mutual Exclusion. Deadlocks in distributed systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 33200.

CSC 43800 - Real-Time Computing Systems

Operating systems and architectural concepts of real-time systems. Review of I/O programming and basic machine language programming. Interrupt processes. Coding of specific device drivers using absolute addressing status registers, command signals, buffering. Timing considerations and applications. Concurrent processes, wait-send phenomena, and the use of semaphores.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 34200 and CSC 34300.

CSC 44000 - Computational Methods in Numerical Analysis

Introduction to numerical algorithms for scientific computation. Basic concepts of numerical error. Interpolation, quadrature, solution of linear systems of equations, non-linear equations, ordinary differential equations. Some discussion of partial differential equations and numerical methods of solving them. Computer implementation aspects.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 30100.

CSC 44200 - Systems Simulation

Simulation of dynamic stochastic systems using models involving numerical and logical processes. Modeling concepts, description in terms of entities, attributes, and activities, time flow mechanisms, queues, event-oriented vs. particle-oriented models. Generation of stochastic variates, collection and evaluation of statistics. Simulation languages. Computer projects using a general purpose language (e.g. Fortran or Matlab) and at least one simulation language (e.g. GPSS) will be assigned.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 30100.

CSC 44600 - Mathematical Optimization Techniques

Maximization and minimization of functions of several variables, with and without constraints. Convex sets and functions, linear and dynamic programming, network flows.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 30100.

CSC 44800 - Artificial Intelligence

State-space and problem-induction representations of problems. Heuristic methods. Mechanical theorem proving. Application of these techniques to artificial intelligence problems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 30400.

CSC 45000 - Combinatorics and Graph Theory

An introduction to combinatorial analysis and graph theory. Sample topics: principle of inclusion and exclusion, recurrence relations, zero-one matrices, partitions, Polya's Theorem, directed graphs,

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 22000 and (CSC 21700 or EE 31100).

CSC 45400 - Topics in Computer Architecture

Current developments in computer architecture chosen from: superscalar parallel/pipelined architectures: speculative execution; branch prediction; register renaming techniques. Students develop software for superscalar processors, both real and simulated.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 34200 and CSC 34300.

CSC 47000 - Image Processing

An intensive introduction to digital image processing. Image enhancement, digital filtering theory. Fourier transforms, image reconstruction, resampling, antialiasing, geometric transformations, scanline algorithms, warping, and morphing. Emphasis is on computational techniques. Substantial programming assignments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 22100

CSC 47100 - Computer Vision

An intensive introduction to algorithms that recover information from images, motion sequences, multiple views, and 3D volumes. Topics include edge and region recovery, perspective, texture, object recognition, and 3D shape from shading/stereo/motion. Substantial programming assignments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 30100 and CSC 32200.

CSC 47200 - Computer Graphics

An intensive study of computer graphics. Graphics hardware, OpenGL API, raster scan conversion, clipping, geometric transformations, 3D viewing, visible surface determination, illumination, shading, splines, ray tracing and animation. Substantial programming assignments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 22100.

CSC 47300 - Web Site Design

The design and implementation of web sites and web applications. Current web technologies will be reviewed as well as principles of user experience design. Students will learn to write a web application in a web framework. There will be an emphasis on testing, working in a small team and software engineering best practices. The design and implementation of web sites from a Human-Computer Interaction viewpoint, with emphasis on user testing. Navigation design. Accessibility by persons with limitations in vision or motor ability is stressed and must be addressed in the final project.

Credits: 3. Contact Hours: 3 lab hr./wk. Prerequisite: CSC 22100.

CSC 47800 - Topics in Multimedia and Image Processing

Topics of current interest in image processing, computer vision, computer graphics, and multimedia.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 47000.

CSC 47900 - Digital Libraries

An introduction to the principles and practice of digital libraries. Algorithms are drawn from computer vision, pattern recognition, image processing, and document processing. Topics include low-level image processing, texture, color constancy, shape from X, supervised and unsupervised training, and implementation issues regarding content based multimedia database. Programming assignments will be implemented in C++ or Java.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 32200 and MATH 34600 (min. C grade).

CSC 48000 - Computer Security

An introduction to the principles and practices of computer security in various computing environments. Conventional encryption systems and classical cryptography. Confidentiality using conventional encryption. Public key cryptography and protocols for authentication and digital signatures. Recent cryptanalytic attacks on conventional and public key systems. Intruders, worms, viruses and trusted systems. Firewalls and internetwork security. A survey of applications and problems arising in contemporary computer security.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 22000, CSC 30400, and (CSC 21700 or EE 31100).

CSC 48600 - Introduction to Computational Complexity

An introduction to the performance and limitations of computer algorithms through a study of selected algorithms. Topics include primality testing and integer factorization, algorithms for integer programming and knapsack problems, reductions and NP-completeness, randomized algorithms, and experimental algorithms arising from new technologies such as molecular, neural, and quantum computing.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CSC 21700 and CSC 30400.

CSC 51001-51004 - Independent Study

Independent study and research under the supervision of a mentor.

Credits: 1-4. Contact Hours: Hours vary Prerequisite: Departmental approval.

CSC 59001 - Co-op Study I

The first of a two semester co-op experience overseen jointly by department faculty and the supervising employee of the participating company. Course is only offered in the Spring.

Credits: 3. Contact Hours: 3 Prerequisite: Junior or Senior Standing and Permission of the Department

CSC 59002 - Co-op Study II

The first of a two semester co-op experience overseen jointly by department faculty and the supervising employee of the participating company. Combined with Co-op Study I in the first semester or co-op Study III in the second semester to reflect the workload of co-op.

Credits: 3. Contact Hours: 3 Prerequisite: Junior or Senior Standing and Permission of the Department. Corequisite: Pre- or co-requisite CSC 59001

CSC 59003 - Co-op Study III

The second of a two-semester co-op experience overseen jointly by department faculty and the supervising employee of the participating company. Course is only offered in the Summer.

Credits: 3. Contact Hours: 3 Prerequisite: CSC 59001

CSC 59800 - Senior Project

Senior projects under the supervision of a mentor.

Credits: 3. Contact Hours: Hours vary Prerequisite: Departmental approval.

CSC 59866 - Senior Project I

This is a two semester capstone course. The student is required to complete a significant project in computer science or engineering under the mentorship of a faculty member. In addition to technical material required for successful completion of a specific project, topics include identification of a problem, background research, social, ethical and economic considerations, intellectual property and patents and proposal writing, including methods of analysis and theoretical modeling. A detailed project proposal is formulated in the first semester, and the

project is completed in the second semester. Each student is required to write an in-depth report, and to make an oral presentation to the faculty. Senior year students only, or permission of the department.

Credits: 3 cr. per semester for two consecutive semesters.. Contact Hours: 3 lect. and 3 design hr./wk.

Ethics component is required.

CSC 59867 - Senior Project II

This is a two semester capstone course. The student is required to complete a significant project in computer science or engineering under the mentorship of a faculty member. In addition to technical material required for successful completion of a specific project, topics include identification of a problem, background research, social, ethical and economic considerations, intellectual property and patents and proposal writing, including methods of analysis and theoretical modeling. A detailed project proposal is formulated in the first semester, and the project is completed in the second semester. Each student is required to write an in-depth report, and to make an oral presentation to the faculty. Senior year students only, or permission of the department.

Credits: 3 cr. per semester for two consecutive semesters.. Contact Hours: 3 lect. and 3 design hr./wk.

Ethics component is required.

CSC 59900 - Selected Topics in Computer Science

Topics of current interest in the field. Independent study and seminars.

Credits: Variable hr./ cr.. Prerequisite: Departmental approval.

CSC 59944 - Neural Computing

Credits: 3. Contact Hours: 3 hours

EAS - Earth and Atmospheric Science Course Descriptions

EAS 10000 - The Dynamic Earth

Basic concepts of geology. The materials, structures, and surface features of the earth, and the processes which have produced them.

Credits: 3. Contact Hours: 3 hr./wk.

EAS 10100 - The Atmosphere

An introduction to the processes and phenomena of our atmosphere for non-science majors. Topics include clouds, sky color, greenhouse effect, storms, climates and Ice Ages.

Credits: 3. Contact Hours: 3 lect. hr./wk.

EAS 10300 - Environmental Geology

An introduction to the geological aspects of environmental issues and sustainability for non-science majors. Presents the basic concepts of geology, followed by discussion of selected environmental issues, such as mineral and energy production; water supplies and pollution; flooding and erosion; earthquake and volcanic hazards.

Credits: 3. Contact Hours: 3 lect., hr./wk.

EAS 10400 - Perspectives of Global Warming

Provides a concise and current view of the factors governing global warming and climate change and its implications for society as a whole. The use of climate models and data analysis build an understanding of the quantitative elements of the climate system and demonstrate how climate change is measured. Topics include: Earth's energy balance, measuring climate change, statistical significance of cycles, natural and anthropogenic sources of climate change, consequences of climate change, and modeling and predicting climate change. This course is recommended for non-EAS majors with an interest in learning the science behind the climate change debate.

Credits: 3. Contact Hours: 3 lect., 1 lab hr/wk.

EAS 10600 - Earth Systems Science

A systematic global view of the features, processes, and underlying scientific concepts of the earth, atmosphere, and oceans, emphasizing environmental applications. Lab fee = \$10.

Credits: 4. Contact Hours: 3 lect., 3 lab. hr./wk.

EAS 21300 - Engineering Geol

Fundamental facts and principles of geology with special reference to their importance in engineering projects; geologic perspective on current environmental issues; remote sensing; techniques for geologic study of project sites in terms of the surface and subsurface environment.

Credits: 3. Contact Hours: 6 hours

EAS 21700 - Systems Analysis of the Earth

Analysis and modeling of the grand cycles and systems in the Earth Sciences, including plate tectonics and climate change, by incorporating the underlying physical, chemical and biological principles. Physical and chemical properties of earth materials are examined. EXCEL and STELLA software are used extensively.

Credits: 4. Contact Hours: 3 lect., 2 lab. hr./wk. Prerequisite: EAS 10600, or ENGR 10610, PHYS 20400 or CHEM 10301, or equivalent.

EAS 22700 - Structural Geology

Geometry of elementary earth structures, especially faults and fractures, their modes of origin, stress analyses, and models. The mechanics of naturally occurring structures and their relationship to human-made structures. Includes earthquake mechanics and development of geological maps.

Credits: 4. Contact Hours: 3 lect., 2 lab. hr./wk. Prerequisite: EAS 10000, EAS 10600, or ENGR 10610.

EAS 30000 - Earth and Environmental Science Seminar

Presentations and discussions by faculty and guest speakers on current topics in the area of earth and environmental science.

Credits: 1. Contact Hours: 1 hr./wk. Prerequisite: EAS 10600 or ENGR 10610, or permission of instructor; can be taken twice for credit.

EAS 301-304** - Honors I-IV**

Research and studies in Earth Systems Science. Approval from the Department required. Apply in MR-106, no later than December 10 in the Fall term or May 1 in the Spring term.

Credits: Variable cr.. Contact Hours: usually 3 cr./sem.

EAS 30800 - ESS Modeling/Databases

Applications of the principles of ESS to the diagnosis and modeling of global and local environmental problems. Introduction to remote sensing techniques, processing, and analyses of global data sets, and computer models of Earth Systems.

Credits: 3. Contact Hours: 3 lect., 1 lab. hr./wk. Prerequisite: EAS 21700, or permission of instructor.

EAS 30900 - Fundamentals of Atmospheric Science

This course is an introductory survey of the field of atmospheric science, with special attention given to atmospheric thermodynamics, dynamics, and weather systems. Atmospheric science is a complex field of study that builds on physics, chemistry and math, hence the prerequisites. This course is intended to provide a solid foundation for students studying earth science and/or environmental remote sensing.

Credits: 3. Contact Hours: hr./wk. Prerequisite: Vector Calculus, CHEM 10401(or equivalent). and PHYS 20700(or equivalent) or instructor's permission

EAS 310 - Independent Study**

Individual laboratory, field or library investigation of a problem in Earth Systems Science.

Credits: 1-4. Contact Hours: 1-4 cr./sem. Prerequisite: Approval of instructor required.

EAS 31003 - Independent Study

Credits: 3. Contact Hours: 3 hours

EAS 311-315** - Selected Topics in Earth Systems Science**

Current topics and problems with emphasis on aspects not treated in regular courses.

Credits: 3-4. Contact Hours: 3-4 lect. or rec. hr./wk. 3-4cr./sem. Prerequisite: Department permission required.

EAS 31300 - Envir. Geochemistry

Shallow earth interactions in ESS emphasizing: groundwater geochemistry; elemental cycles linked to biological activity in the oceans; geochemistry and global climate cycles; x-ray diffraction, potentiometric titrations, and aspects of UV/visible spectroscopy.

Credits: 3. Contact Hours: 3 hours

EAS 32800 - Global Environmental Hazards

Study of important, naturally-occurring, destructive phenomena, such as earthquakes, volcanic eruptions, landslides and coastal flooding. Long-term causes and remediation of these problems. Topics will focus on consequences to urban environments.

Credits: 3. Contact Hours: 3 lect. hr./wk.

EAS 33000 - Geographic Information Systems

Introduction to Geographic Information Systems using ArcGIS. Analysis of spatial data based on location. Hands-on work with downloading databases from the Internet, modification of formats, editing, and data analyses. Visual representation of data will emphasize different data types (point, linear, and spatial) and use of various analytical tools (IDW, spline, nearest neighbor, quadrat analysis, and different pattern types, such as random, clustered uniform, bi-modal, etc). Environmental Applications are stressed in class and include: Earthquake Patterns and Risk Analysis, Vegetation Patterns and Changes over Time, Patterns of Sea Level Change due to Global Warming, remote sensing of fracture patterns, aerosol dispersal over time, pollution plumes in subsurface groundwater.

Credits: 3. Contact Hours: 3 hr./wk.

EAS 33300 - Phase I Environmental Site Assessments

The purpose of this course is to introduce students to good commercial and customary practices in the US for conducting Phase I environmental site assessments (ESA) of commercial or residential properties with respect to hazardous substances and petroleum products. A Phase I ESA is the process for determining the presence of an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into the ground, ground water, surface water of the property, or into structures on the property.

Credits: 3. Contact Hours: 3 hr./wk.

EAS 33400 - Phase II Environmental Site Assessments

The purpose of this course is to introduce students to good commercial and customary practices in the United States of America for conducting Phase II environmental site assessments (ESA). A Phase II ESA is an evaluation process for confirming and quantifying the presence of hazardous substances or petroleum products in environmental media (i.e., soil, rock, groundwater, surface water, air, soil gas, sediment) throughout a contaminated site. A Phase II ESA typically includes a determination through field screening and chemical testing of the geological, hydrogeological, hydrological, and engineered aspects of the site that influence the presence of hazardous substances or petroleum products (e.g., migration pathways, exposure points) and the

existence of receptors and mechanisms of exposure. Students are automatically enrolled in the 40-hour OSHA HAZWOPER (Hazardous Waste Operations and Emergency Response Standard) certification program which applies to employees who are engaged in clean-up operations that are conducted at uncontrolled hazardous waste sites.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EAS 33300 or permission of instructor.

EAS 34500 - Hydrology

Introduction to hydrological data, the hydrologic cycle. Precipitation, streamflow, evaporation, and runoff. Emphasis is on their interactions and processes.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: Two semesters of Calculus and two semester of Physics, or permission of instructor.

EAS 36500 - Coast and Ocean Processes

Principles governing the atmosphere-land-ocean-biosphere interactions in coastal environments. Topics include: coastal dynamics, bathymetric features, sea-level change, wave formation, physicochemical properties of the ocean; coastal biogeochemical processes; remote sensing observations (land-atmosphere-ocean); coastal urbanization; atmospheric pollution and impacts on coastal ecosystems; coastal acidification; eutrophication; coastal hazards; human impacts & management of coastal zones.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: EAS 10600 or BIO 10200, or permission of instructor.

EAS 41300 - Environmental Geochemistry

A traditional geochemistry survey course that emphasizes earth system science considerations. The survey includes groundwater systems, the ocean system, carbon-silicon cycle relative to these systems, stable and radioisotope geochemistry, trace metal distribution theory and applications, and an introduction to igneous and metamorphic petrology.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: EAS 21700, or permission of instructor; pre- or co-req. CHEM 10401.

EAS 41700 - Satellite Meteorology

Satellites have become an increasingly important tool for studying and monitoring the Earth's weather and climate. Topics include orbits of meteorological satellites, instruments they carry, fundamentals of atmospheric radiation and remote sensing, meteorological parameters that can be retrieved from satellites, and applications. Matlab is used to analyze satellite data.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MATH 20300, and PHYS 20800, or permission of instructor.

EAS 42600 - Environmental Remote Sensing and Image Analysis

Remote sensing of the environment is a course devoted to the study of earth system interactions through downloading and manipulating satellite data. The course reviews the historical creation of satellite platforms, current usages of satellite data in the earth sciences, and emphasizes image analytical techniques used to highlight important data sets. Lecture and laboratory work emphasizes the use of Interactive Data Language (IDL) programming to perform image manipulations.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: Undergraduate course in computer science or permission of instructor.

EAS 42700 - Remote Sensing of the Ocean

A comprehensive introduction to space-based remote sensing of ocean processes. Through guest lectures, student-led discussions, interactive activities, skills development, and hands-on team projects, the course reviews the basic concepts, satellite datasets, and algorithms available for studying ocean dynamics, mesoscale phenomena, biogeochemical processes, marine ecosystem resources, human impacts, and coastal hazards.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: EAS 10600, or ENGR 10610, or BIO 10100, or permission of instructor.

EAS 43000 - Sedimentology

Composition, texture, classification, depositional setting, provenance and correlation of sediments and sedimentary rocks; identification of common environments of deposition. Study of global and local formations to explore stratigraphic nomenclature, facies relationships and correlation of sedimentary sequences. Course includes a field trip to local outcrops to observe sedimentary rocks and facies and identify depositional paleoenvironments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EAS 10600.

EAS 43900 - Mineral/Energy Resources

Minerals in Earth Systems Science: principles of mineral stability and mineral associations; identification and recovery of earth resources. Mineral issues in human terms: toxic waste sites, climatology, and slope stability. Course introduces mineral optics and x-ray diffraction.

Credits: 4. Contact Hours: 2 lect., 4 lab. hr./wk. Prerequisite: EAS 21700, or permission of instructor.

EAS 44600 - Groundwater Hydrology

Occurrence of ground water. Basic equations and concepts of groundwater flow. Flow nets. Methods of groundwater investigation.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: MATH 20300 or MATH 20900, and PHYS 20800 or PHYS 20400, and EAS 10600 or ENGR 10610, or permission of instructor.

EAS 44800 - Terrestrial, Aquatic and Atmospheric Systems

Overview of critical Earth systems and their interrelationships; Lecture component places environmental issues in an ecological framework; Hands-on laboratory component introduces concepts and methods used in Earth system analysis with emphasizes in sustainable management of aquatic, terrestrial and atmospheric systems. Data set analysis tasks are assigned and student presentations are given throughout this class.

Credits: 4. Contact Hours: 6 hr./wk. Prerequisite: EAS 10600 or ENGR 10610 or permission of instructor.

EAS 45000 - Environmental Field Methods

This course introduces basic field concepts and applications related to the environmental evaluation of water, soil, and sediment quality. It focuses on various environmental sampling and monitoring techniques, laboratory chemical analyses, and data reporting. Topics will include surface/ground water sampling, soil sampling, sediment sampling, stream gauging, groundwater level monitoring, monitoring well installation, etc. The class consists of lectures, field trips, and labs. Each student will prepare field reports, and carry out a small project of his/her choice.

Credits: 3. Contact Hours: 3 hrs./wk. Prerequisite: CHEM 10401, PHYS 20800, and EAS 44600, or permission of instructor.

EAS 472 - Environmental Project**

Senior-level capstone research project utilizing laboratory, remote sensing, and/or field data, in combination with associated measurement techniques and analysis tools to address a problem in the geosciences selected with a faculty mentor. Upon completion, students are required to write an in-depth scientific report and make an oral presentation of their work to the faculty. Course may be taken over two semesters.

Credits: 4-6. Contact Hours: (minimum 4 credits in total). Prerequisite: EAS 21700 and EAS 22700 Corequisite: EAS 30800, and permission of instructor.

EAS 48800 - Climate Change

This course links processes and interactions of the atmosphere, ocean, and solid earth and their impact on climate and climate change. Topics include the physical principles of climate; climates of the past and

present; Ice Age theories; the Greenhouse Effect; and human impact on climate.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: EAS 10100 or EAS 10600, or ENGR 10610; one semester of college math.

EAS 52800 - Plate Tectonics/Geodynamics

Detailed discussions of the concepts of mantle convection, continental drift, seafloor spreading, and subduction. Applications of these concepts to selected areas around the globe. The relationship of plate tectonics to earth history and to the global distributions of geologic hazards and mineral deposits. Implications of plate tectonics for other parts of the earth system.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: EAS 10600 or ENGR 10610.

EAS 56100 - Geophysics

This course covers the physical principles that govern the behavior and techniques used to infer the earth's internal structure, composition, and mineral resources. It provides earth scientists and engineers with the techniques to determine earth structures, locate environmental pollutants, and prospect for natural resources from remote locations. Topics include: seismology, geodesy, gravity, magnetics, and thermal properties of the earth.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: EAS 10600 or ENGR 10610 and PHYS 20400 or PHYS 20800.

EAS 56500 - Environmental Geophysics

The application of geophysics to environmental and engineering problems. Hands-on work and demonstrations on seismic, electrical, electromagnetic and magnetic instruments and techniques. Survey design and execution. Computer analysis of survey results.

Credits: 3. Contact Hours: 3 lect., hr./wk. Prerequisite: MATH 20100 or MATH 20500.

EAS 56600 - Solid Earth Geochemistry

Deep earth involvement in Earth Systems Science: plutonism and volcanism; isotopic age dating; non-radiogenic isotope systematics; and trace metal characteristics of evolving earth systems. Course introduces petrography and x-ray fluorescence.

Credits: 3. Contact Hours: 3 lect. hr./wk.

ECO - Economics Course Descriptions

ECO 10150 - Principles of Management

Theory and practice of the modern organization, its historic development, and its role in our modern society. The course takes a functional approach, first introducing the role of a manager and the modern managerial environment, then exploring planning, organizing, leading, and control. Particular attention is given to developing the skills necessary to manage, lead, and compete in today's world.

Credits: 3. Contact Hours: 3 hr./wk.

ECO 10250 - Principles of Microeconomics

This introductory course develops the basic tools and methods of microeconomic analysis. The choices of individual decision makers are analyzed in studying how markets operate. The fundamentals of supply and demand, consumer and firm behavior, and market interactions are examined. Applications to current microeconomic issues are discussed in the course, for example, the role of government in markets.

Credits: 3. Contact Hours: 3 hr./wk.

ECO 10300 - Prin Macroeconomics

Price determination in markets and the behavior of consumers and firms. Factors influencing aggregate output, employment and the price level. Role of government and monetary authorities in the economy. Inte

Credits: 3. Contact Hours: 3 hours

ECO 10350 - Principles of Macroeconomics

This introductory course develops the basic tools and methods of macroeconomic analysis. Issues of employment and unemployment, inflation, the level of output and its growth, and other important current policy problems are examined within the framework of models that economists use. The main area of current applications will be the United States economy, but attention will also be given to international economic issues.

Credits: 3. Contact Hours: 3 hr./wk.

ECO 10400 - Introduction to Quantitative Economics

For students enrolled in the School of Engineering. An integrated intensive treatment of micro- and macroeconomics. Modern analytical approach employed to treat topics including theory of consumer demand, theory of firm, market structure, inflation, unemployment, and economic growth. Special emphasis on managerial economics and empirical methods by which economists test hypotheses and estimate parameters. Replaces ECO 10250 and ECO 10350.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MATH 20100 or MATH 20500.

ECO 19150 - Honors Principles

For students enrolled in Honors Program. Replaces ECO 10250 and ECO 10350.

Credits: 3. Contact Hours: 3 hr./wk.

ECO 20150 - Principles of Statistics

Introduction to statistical methods and reasoning. Nature and scope of statistical inquiries, collection, and presentation of data. Descriptive methods, with particular reference to frequency distribution, regression and correlation, index numbers and time series analysis. Elements of probability, sampling methods, sampling error, and principles of estimation and testing.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: ECO 10150, ECO 10250, ECO 10350, and MATH 20100 or MATH 20500.

ECO 20250 - Intermediate Microeconomics

Forces determining product and factor prices and quantities under alternative market structures. Consumer demand, production, and cost; firm and industry.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 10150, ECO 10250, ECO 10350, and MATH 20100 or MATH 20500.

ECO 20350 - Intermediate Macroeconomics

Factors determining income, employment, price levels, and interest rates. Emphasis placed on policy problems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 10150, ECO 10250, ECO 10350, and MATH 20100 or MATH 20500.

ECO 20450 - Principles of Accounting I

Introduction to accounting cycle, fundamental concepts and techniques of accounting for business transactions and preparation of financial statements.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: ECO 10150, ECO 10250, ECO 10350, and MATH 20100 or MATH 20500.

ECO 21150 - Consumer Behavior

What makes consumers tick? We study the main factors, both external and internal to the consumer, that determine consumer behavior and decision-making in the marketplace. We also examine how to research and assess the consumer behaviors that are at work in a given situation. The essential focus of the course is on implications for marketing strategy development, but ethical/regulatory considerations are also discussed.

Credits: 3. Contact Hours: 3 hours

ECO 21250 - Principles of Marketing

Distribution and sale of goods and services from production to final consumption. Includes changing behavior of consumers and relationship to producers' selling behavior; and the economics of merchandising, including product life cycle, location theory, and optimal sales effort.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 10150.

ECO 21350 - International Environment of Business

Causes, dimensions, consequences, and evolution of our current interdependent world economy. Examines the institutional background of the world financial order, international income comparisons, foreign exchange, balance of payments, the multinational enterprise, international trade, and international investment.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: ECO 10150, ECO 10250, ECO 10350, and MATH 20100 or MATH 20500.

ECO 21450 - Business Law

Basic principles of law of business contracts and their applications to business transactions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 10150, ECO 10250, ECO 10350, and MATH 20100 or MATH 20500.

ECO 21850 - Managerial Economics

Use of management science for the efficient administration of economic units, including applications to production, financial, and marketing operations. Attention given to the formulation of models to analyze management problems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 10150, ECO 10250, ECO 10350, and MATH 20100 or MATH 20500.

ECO 22000 - Microeconomics 1

Forces determining product and factor prices and quantities under alternative market structures. Consumer demand, production, and cost; firm and industry.

Credits: 3. Contact Hours: 3 hours

ECO 22100 - Microeconomics 2

Factor markets; introduction to general equilibrium theory, capital theory, and welfare economics.

Credits: 3. Contact Hours: 3 hours

ECO 22250 - Corporate Finance

Economic principles underlying operations of modern business corporations and regulatory controls pertaining thereto. Procurement of capital and conservation of capital resources. Problems of capitalization.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450 and MATH 20100 or MATH 20500.

ECO 22350 - Economics of Investments

Security analysis with emphasis upon meaning, measurements and relationship of risk. Portfolio analysis, alternative approaches to valuation, determination of asset values in open market, internal and external rates of return, objectives of investment decision.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450 and MATH 20100 or MATH 20500.

ECO 22600 - Macroeconomics II

Theoretical analysis of economic growth, fluctuations and technological change. Emphasis placed on policy implications, with particular reference to developed economies.

Credits: 3. Contact Hours: 3 hours

ECO 23150 - Environmental Economics and Sustainability

How the science of economics helps to understand and moderate human effects on the environment; how people make choices when their unlimited wants meet scarce resources particularly public goods; how to ensure that the finite resources of the globe are sustainable. Students will integrate theory with public policy in analyzing proposed solutions in areas such as pollution regulation, emissions cap-and-trade, and tradable permits. Students will evaluate particular theories about the effectiveness of such strategies against empirical findings documented in studies from a variety of disciplines not limited to economics.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 23250 - Energy, Commodities, and the Environment

Overview of the physical processes of extraction of selected commodities such as gold and other metals, fuels such as coal and petroleum, water, food. The markets for these commodities, the institutions that shape these markets, and the economic forces impelling valuation changes. Review of global climate change, evaluation of economic forces, the spectrum of government policies, and the implications for commodities.

Credits: 2. Contact Hours: 2 hr./wk. Corequisite: EAS "Energy, Commodities, & the Environment".

ECO 23350 - Economic History

Traces the important developments that have led to our current economic world. Commercial and Industrial Revolutions, the spread of trade correlation with imperialism. Economic causes and effects of the Great Depression as well as wars. Patterns of trade and development in post-war period. Origins of current economic issues; how current institutions and business practices first arose.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350.

ECO 23450 - Law and Economics

Examines relationship of economic principles to law and the use of economic analysis to study legal problems, to understand the behavioral consequences of legal rules as well as how legal rules can meet social goals of efficiency. Topics include civil and criminal law, contracts and property, antitrust rules, intellectual property, and dispute resolutions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450 and MATH 20100 or MATH 20500.

ECO 25400 - Urban Economics

Economic origins of cities and suburbs; effects of technological change on industrial structure and urban land use patterns; economics of urban transportation, housing, public utilities, and municipal services; roles of government and private enterprise.

Credits: 3. Contact Hours: 3 hours

ECO 26100 - Economics Regulation

Study of appropriate social controls where competition is lacking; role of government in direct regulation of price and output, and related matters.

Credits: 3. Contact Hours: 3 hours

ECO 26400 - Public Finance

Taxes and debts of federal, state and local government; budgets and intergovernmental fiscal relationships; the economic implications of their financial activities.

Credits: 3. Contact Hours: 3 hours

ECO 26500 - Public Expenditure

Introduction to public expenditure theory (cost-benefit analysis); political and economic approaches to government decision making.

Credits: 3. Contact Hours: 3 hours

ECO 29000 - Prin Of Stat

Introduction to statistical methods and reasoning. Nature and scope of statistical inquiries, collection, and presentation of data. Descriptive methods, with particular reference to frequency distribution, regression and correlation, index numbers and time series analysis. Elements of probability, sampling methods, sampling error, and principles of estimation and testing.

Credits: 4. Contact Hours: 4 hours

ECO 31000 - Independent Study

The student will pursue a program under the direction of a member of the Department with approval of the Chair.

Credits: 1-4. Contact Hours: Credit may be from 1-4 credits, determined before registration, by the instructor with the approval of the Department Chair.

ECO 31150 - Developing Management Skills

This experiential course attempts to bridge the theory-practice gap, addressing both time-honored principles of effective management and the latest research in the area. Students are introduced to surveys, exercises, and simulations that help them analyze and evaluate their existing managerial skills. A variety of conceptual tools help students develop and refine these skills.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450 and MATH 20100 or MATH 20500.

ECO 31206 - Leadership

Credits: 3. Contact Hours: 3 hours

ECO 31250 - Human Resource Management

Critical assessment and evaluation of human resources management (HRM) policies and practices. Emphasized skills include: understanding performance appraisal forms; conducting basic job analysis and applying understanding of job requirements to other HRM systems such as selection and compensation; related applications of theories on managing people in organizations. Personnel functions in larger organizations; attitudes toward work; role of government, public interest groups and unions in determining job environment. Development of manpower and management resources; planning manpower needs, management of compensation programs.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 31350 - Operations and Production

Investigation of production systems. Application of analytical techniques to product and process design, optimal plant location, efficient plant design. Planning for production. Systems of inventory and quality control.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 31450 - Business Law II

Basic principles of law governing the formation, operations and dissolution of proprietorships, partnerships and corporations.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 31550 - Marketing Research

This course is focused on providing a background in marketing research not just to those planning to pursue careers as researchers, but to anyone who might commission, manage, or use marketing research as a part of his/her career. Students will gain an understanding of the critical aspects of executing a marketing project, including research design, data acquisition, and data analysis. They will become familiar with both quantitative and qualitative marketing research techniques. They will

gain proficiency in marketing data analysis through hands-on work on a data project.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 31650 - Organizational Behavior

Explores the impact of individual actions, group behavior, and structures in the operation of organizations. Its focus is the application of such knowledge to the better functioning of all types of collective activity. Among the primary themes considered in this course are leadership, improving motivation and productivity, culture, reducing undesirable worker behaviors, ethics, the effect of personality and emotion in the workplace, and job satisfaction.

Credits: 3. Contact Hours: 3 hours

ECO 31750 - Economics Environmental Entrepreneurship

Introduces students to non-profit and corporate value-creative business models working to address global climate change and poverty. Students will be exposed to theoretical knowledge as well as the various finance, strategic planning and research methods currently used in environmental revitalization and economic development projects world-wide. Includes a service-learning component where students provide consultancy on a real-world green urban renewal project for New York-based social value creating ventures.

Credits: 3. Contact Hours: 3 hours

ECO 31850 - Managerial Economics

Credits: 3. Contact Hours: 3 hours

ECO 31950 - Leadership

Leadership in an organizational context. This course serves to encourage students to carefully analyze their responsibilities and commitments in the context of leadership for the common good and for purposeful change. Includes the study of leadership as well as the application of leadership theories, concepts, and skills.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 32150 - International Finance

Macroeconomic theory and policy in open economy. Issues associated with balance of payments disequilibrium, fluctuating currency values, international factor flows and international capital mobility. Extensions of Keynesian model; monetary and fiscal policy for internal and external balance, macro policy coordination.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 32250 - Money and Banking

Organization and operation of U.S. financial system, both public and private; money and capital markets, commercial banking policy; relationship between financial and economic activity, including monetary and fiscal policy.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 32350 - Accounting II

Emphasis on the use of accounting data and analysis of management decisions.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: ECO 20450.

ECO 33150 - Introduction to Econometrics

To introduce students to the fundamentals of econometric models and techniques. Course includes critical evaluation of economic modeling objectives; econometric methods; examples of empirical economic research and exercises in applied econometrics. Emphasizes applications to economics, finance and business.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 33250 - Microeconomic Theory II

Factor markets; introduction to general equilibrium theory, capital theory, and welfare economics.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 33350 - Macroeconomics II

Theoretical analysis of economic growth as well as convergence/divergence, globalization, and macro dynamics. Emphasis on intertemporal maximization problems such as overlapping generations and general-equilibrium growth theories.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450, and MATH 20100 or MATH 20500.

ECO 33450 - International Trade

Development; trade doctrines; gains from trade; theory and practice of protection; balance of payments, capital exports, and theory of transfer; interrelations between domestic economies and international economy.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 33550 - Urban Economics

Economic origins of cities and suburbs; effects of technological change on industrial structure and urban land use patterns; economics of urban transportation, housing, public utilities, and municipal services; roles of government and private enterprise.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 33650 - Public Finance

Taxes and debts of federal, state and local government; budgets and intergovernmental fiscal relationships; the economic implications of their financial activities.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 33750 - Transportation Econ

The main objective of this course is to introduce the students to major theories, methods and policy issues in the field of urban transportation economics. These include demand analysis and forecasting, cost structure of transport firms, pricing and regulation, competition and market structure, public transit analysis, network economics, externalities and congestion pricing, transportation investment analysis and joint transportation and land-use modeling. Emphasis is on the use of analytical techniques for the analysis of real-world urban transportation problems and policy-making.

Credits: 3. Contact Hours: 3 hours

ECO 33850 - Public Economics

Examines the role of government in private economies including public goods and externalities; spending and taxation at national, state, and local levels; analysis of current government policies.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450, and MATH 20100 or MATH 20500.

ECO 35300 - Strategic Management

Focuses on developing coherent and lasting visions for organizations' future survival and prosperity. Examines decision processes that link an organization's internal capabilities with the external opportunities it faces in the environment. Tools of analysis, planning, and keeping an organization aligned with its environment are introduced.

Credits: 3.

ECO 35800 - Business And Society

Impact of the new governmental "social" regulation upon managerial and administrative decision making in private enterprises and public organizations. Legal, ethical and economic aspects of health, safety, environment, consumerism and the like are considered. Attention given to the effects of regulation on costs, innovation, productivity, inflation and economic growth.

Credits: 3. Contact Hours: 3 hours

ECO 40100 - Internship

Work in a city agency or a private organization for a year as research aide, gaining some practical applications of economic analysis to urban policy programs. Students work approximately ten hours per week in the placement and attend a seminar on campus. Student is expected to complete two consecutive semesters.

Credits: 3 cr./sem.. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500, department permission.

ECO 41150 - Strategic Management

Focuses on developing coherent and lasting visions for organizations' future survival and prosperity. Examines decision processes that link an organization's internal capabilities with the external opportunities it faces in the environment. Tools of analysis, planning, and action related to keeping an organization aligned with its environment are introduced.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 41250 - Entrepreneurship

Emphasis on the identification and analysis of competencies required to launch new ventures. Topics include: the study of entrepreneurial behavior, characteristics of successful entrepreneurs, scanning for unique ideas, methods and techniques for analyzing the competitive environment, writing a business plan, and understanding the challenges of managing a startup organization through various stages of growth.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450, and MATH 20100 or MATH 20500.

ECO 41350 - Business and Society

Analysis of a business's social, legal, political, and ethical responsibilities to both external and internal groups that have a stake, or interest, in that business. An emphasis is placed on the need to understand that business situations will continually arise that will truly test one's values and ethics. Application of stakeholder and ethical systems to specific business problems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450, and MATH 20100 or MATH 20500.

ECO 41450 - Information and Technology Management

Critical analysis of the issues facing managers of information technology. The course explores possible information technology management strategies of an organization, and provides conceptual frameworks for the development and evaluation of information technology management strategies. Emphasis on information technology as a process enabler and strategic facilitator in the Internet age.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450, and MATH 20100 or MATH 20500.

ECO 42150 - Advanced Financial Economics

Leading and contemporary developments in financial management, including security analysis, portfolio analysis, capital budgeting, working capital management, and benefit-cost analysis.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450, MATH 20100 or MATH 20500.

ECO 42250 - Options and Futures

Option pricing theory and applications to corporate finance and security valuation. Options on stocks, futures, commodities and currencies. Organization and operation of futures markets. Futures on commodities and fixed income securities. Stock indexes and international securities. Applications of futures for financial management.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, ECO 20450, and MATH 20100 or MATH 20500, ECO 22250 and ECO 22350.

ECO 43150 - Industrial Organization

Structure of the American economy. Public policy in maintaining competition. Antitrust activities of Justice Department and F.T.C., with special emphasis on leading recent cases.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 43250 - Economic Development

Rates of growth and stages of development; strategic factors in theory and practice; domestic and international problems of growth, with principal attention to underdeveloped countries.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 43350 - Labor Economics

Survey of labor, utilization, allocation and compensation of labor. Unionism, government regulation, and other factors affecting labor resources.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 43450 - Public Investment Analysis

Decisions on public spending and implementation of public investments are based on myriad considerations, including economic, planning, engineering, social, environmental, legal, institutional and political. In this course we will examine in-depth mainly economic and political-economy factors, relative to their theoretical, analytical, and empirical underpinnings. Real world examples, mainly of transportation projects will be discussed.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ECO 20150, ECO 20250, ECO 20350, and MATH 20100 or MATH 20500.

ECO 43550 - Econometrics 2

Advanced topics such as time series, maximum likelihood, method of moments, semiparametric and nonparametric estimators, panel techniques and data mining.

Credits: 3. Contact Hours: 3 hours

ECO 49150 - Honors Thesis I

Approval of Chair is required.

Credits: Variable cr..

ECO 49250 - Honors Thesis II

Approval of Chair is required.

Credits: Variable cr..

EDCE - Teaching, Learning & Culture Course Descriptions

EDCE 20000 - Inquiry in Education

A study of the inquiry process and the resulting knowledge as a basis for learning and thought. Students carry out their own investigation and relate inquiry to elementary curriculum and children's learning. Educational technology integrated throughout.

Credits: 3. Contact Hours: Includes 15 hours of fieldwork 5 hr./wk. Prerequisite: ENGL 11000.

EDCE 20600 - Observing Children and Their Development

This course is grounded in the notion that how children think, how their language develops, and how their families, their culture, and their environment influences and shapes them affect how they learn in school. Salient themes explored include the child as a maker of meaning, the nature of intelligence, attachment, gender identification, and the social context of development (i.e., race, culture, and class).

Credits: 3. Contact Hours: Includes 15 hours of fieldwork. 3 hr./wk. Prerequisite: ENGL 11000.

EDCE 20604 - Theories of Development Applied to Early Childhood Practice

An overview of early childhood education theory and practice from historical and sociocultural viewpoints. Major areas of study include child development, observation and recording techniques, developmentally appropriate practices, multicultural and inclusive classrooms, authentic assessment, family-child-teacher interactions, and subject area methods. Fieldwork required.

Credits: 4. Contact Hours: 4 hr./wk.

EDCE 20614 - Early Childhood: Development, Assessment, and Pedagogy in Inclusive Settings

Students construct a working knowledge of developmental theories and approaches to assessment in relation to the needs of young children with disabilities in inclusive settings. Students will learn to develop appropriate inclusive settings based on examination of special needs in early childhood literature, knowledge of individual children, inclusive curricula models, classroom management, and working with families, special education itinerant teachers, and early intervention and support agencies in multicultural settings. Open to all undergraduates.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: EDCE 20604, or its equivalent.

EDCE 22100 - School, Family, Community

Students gain an understanding of and skills for working with all kinds of families. This includes using the local community and cultures as resources and supports for the child and family, bringing the outside world into the school, and viewing the classroom as a community. Emphasis on special needs, inclusion, and English language learners. Field assignments link theory and practice.

Credits: 2. Contact Hours: 2 hr./wk.

EDCE 22200 - The School in American Society: Bilingual Education in the Urban School

Analysis of selected social, political and economic forces that influence the school as an institution, and in turn are influenced by the school, especially in urban settings. Special attention to immigrant, bilingual and language minority groups. (Students may not receive credit for both EDUC 22100 and EDCE 22200.)

Credits: 3. Contact Hours: Includes 15 hours of fieldwork. 3 hr./wk. Prerequisite: ENGL 11000.

EDCE 25600 - Language, Mind, and Society

An introduction to basic concepts in linguistics, including phonology, lexicon, and grammar, with special consideration to the sociolinguistic & psycholinguistic aspects of bilingualism and biliteracy. These latter include: language variation, language contact, and first- and second-language acquisition. The course should provide a framework for language education.

Credits: 3. Contact Hours: 3

EDCE 31904 - Science in Early Childhood Settings

An introduction to science in classrooms with young children. Through interactions with the physical and natural world, teachers will

investigate ways to bring opportunities for inquiry and discovery to early childhood classrooms. Teachers will draw on NAEYC's Program Standards to underscore everyday experiences in the sciences, and to develop and cultivate children's attempts at inquiry, discovery, and record keeping.

Credits: 2. Contact Hours: 2 hr./wk. Corequisite: EDUC 40800, EDUC 41900.

EDCE 32001 - edTPA Seminar

edTPA Seminar

Credits: 0. Contact Hours: 0

EDCE 32200 - How Children Learn Mathematics: Implications for Teaching

Mathematical development of children from pre-school to Grade 6 through their action and exploration. Students plan for and assess differentiated instruction to students within the full range of abilities. Educational technology integrated throughout.

Credits: 3. Contact Hours: Includes 15 hours of fieldwork. 3 hr./wk. Prerequisite: MATH 18500.

EDCE 32204 - How Children Learn Math

A constructivist foundation for teaching mathematics in Early Childhood based on Piaget, Vygotsky and current ECE theorists including Kamii. Development of mathematical concepts and skills in Early Childhood and through curricular materials. Field assignments link curriculum and theory with ECE classroom practice.

Credits: 4. Contact Hours: 4 hr./wk.

EDCE 32300 - Emergent to Fluent Literacy

Emergent to fluent literacy acquisition for students with diverse cultural and linguistic backgrounds and students with special needs; assessment of semantic, phonic and phonemic awareness; strategies for children having difficulties in acquisition of speaking, listening, reading and writing competencies; organizing shared, guided and independent reading and writing instruction; use of technology.

Credits: 3. Contact Hours: 3 hr./wk., plus 20 hours fieldwork in diverse and inclusive settings

EDCE 32304 - Language Development and Emergent Literacy I

Developmental and constructivist frameworks of early language development and emergent literacy. Children's language development, the development of other communication skills, and the relationship of these to the process of reading. Children's literature examined from sociocultural and multilingual perspectives. Field assignments provide experiences that link theory and practice. Open only to students formally accepted into the Early Childhood Education Program.

Credits: 4. Contact Hours: 4 hr./wk.

EDCE 32310 - Inclusive Practices for the General Education Classroom (Grades 1 - 6)

This course prepares candidates to teach in inclusive classroom settings. Topics of study include: special education law, disability categories, differentiation, strategies for instruction and assessment (emphasis on literacy), co-teaching models, and classroom management. Drawing upon an understanding of disability as natural human variation, candidates develop a case study of a struggling reader and writer in the classroom context.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EDCE 32300. Includes 15 hours of fieldwork.

EDCE 35301-35303 - Teaching Language Arts and Reading in a Bilingual Program (Spanish/Haitian/Chinese)

Methods and materials for teaching language arts and reading in a bilingual program, with emphasis on techniques for teaching, in their own languages, children who speak language other than English.

Credits: 3. Contact Hours: 3 hr./wk.

EDCE 35600 - Language, Mind and Society

An introduction to basic concepts in linguistics, including phonology, lexicon, and grammar, with special consideration to the sociolinguistic and psycholinguistic aspects of bilingualism and biliteracy. These latter include: language variation, language contact, and first- and second-language acquisition. The course should provide a framework for language education.

Credits: 3. Contact Hours: 3 hr./wk.

EDCE 40200 - Language Development and Early Literacy II

Developmental processes of emergent-to-fluent reading, writing, speaking, and communicating. Multiple teaching/curricular/ assessment approaches to beginning reading and writing for children of different cultures, linguistic backgrounds, abilities/ disabilities, and developmental level. Field assignments link theory and practice. Open only to students formally accepted into the Early Childhood Education Program.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: EDCE 32304 Corequisite: EDCE 40300.

EDCE 40300 - Social Studies in Early Childhood Settings

The social studies are developed as the core of an integrated ECE curriculum involving literacy, math, science, and play. Students will explore theories, methods, and materials to help the child understand his/her immediate environments and relationships to them. Emphasis on family, classroom, school and neighborhood. Field assignments link theory and practice. Open only to students formally accepted into the Early Childhood Education Program.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: EDCE 32304 Corequisite: EDCE 40200.

EDCE 40500 - Facilitating Children's Artistic Development

Students explore the use of a range of art materials and activities for young children at various developmental stages and methods for supporting their total development. The natural sequences and stages of children's drawings and their link to emergent literacy and other developmental areas are explored. Field assignments link theory and practice. Open only to students formally accepted into the Early Childhood Education Program.

Credits: 2. Contact Hours: 2 hr./wk.

EDCE 40600 - Facilitating Children's Musical Development

A study of young children's interest and response to rhythms, dramatic play, and spontaneous imaginative experiences that the teacher can guide and incorporate into a program of developmental activities. Field assignments link theory and practice. Open only to students formally accepted into the Early Childhood Education Program.

Credits: 2. Contact Hours: 2 hr./wk.

EDCE 40800 - Student Teaching and Integrative Seminar in Early Childhood Education

Supervised student teaching in two of the three ECE levels: Pre-K, Kindergarten, and grades 1 & 2, with a minimum of 300 hours. Weekly seminar. Students must apply and be formally accepted into student teaching.

Credits: 6.

EDCE 41500 - Seminar in Childhood Education

An opportunity for candidates to reflect with others about their student teaching experiences and a forum for discussion of relevant issues in education. Topics of discussion and/or assignments include: integrating theory and practice, facilitating classroom community through structures and routines, planning coherent and integrated curriculum, analyzing the physical education and health curriculum, implementing differentiated instruction in the general education and or inclusive

classroom, integrating instruction and assessment to inform teaching and support student learning, and fostering respectful and effective home-school relations. Candidates will be asked to consider the social/political/cultural landscape of public education and its impact on the classroom. Candidates will compile a portfolio that documents their growth as a teacher.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: 100 hours of fieldwork, EDCE 32200, EDCE 32300, EDCE 32310; Pre- or Coreq.: EDCE 42000, EDCE 42100, EDCE 42300, EDCE 41800, EDUC 41900.

EDCE 41600 - Seminar in Bilingual Childhood Education

Application of the principles of teaching to all aspects of the curriculum. Understandings and skills to plan a coherent and integrated curriculum. Assessment systems that inform teaching and support student learning. Developing classroom structures, routines, teaching strategies and skills that build community and maintain discipline with a range of learners. Special emphasis is given to match instructional approaches to the needs and interests of diverse learners as well as to build a respectful and productive classroom environment and effective home-school relations.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: 100 hours of fieldwork, EDCE 32300, EDCE 32310, EDCE 32200 Corequisite: EDCE 45800, EDUC 41900.

EDCE 41800 - Student Teaching in Childhood Education

Student teaching is full-time five days a week for fifteen weeks. Students will have one main placement in grades 1--6. The student teaching experience is designed to provide prospective childhood teachers with opportunities to teach and critically analyze teaching practices in urban classrooms. Students will: develop and improve teaching practices and organizational skills; plan instruction to meet the academic, cognitive and emotional needs of all students, including the special needs child and the English language learner; practice formal and informal assessment techniques; examine special features of classroom management in the inclusive classroom; develop awareness of the many ways in which the classroom, home and community environment are supportive of the learner. 300 hours.

Credits: 4. Contact Hours: 20 hr./wk. Corequisite: EDCE 41500, EDCE 41900

EDCE 41900 - Professional Development Seminar

Workshops required for certification held on the CCNY campus including: Child Abuse Identification and Violence Prevention.

Credits: 0.

EDCE 42000 - Science in a Program of Childhood Education

An introduction to learning science at the elementary level. Emphasis on firsthand experiential learning of science through the design, conduct, and communication of science investigations that portray underlying elements of science inquiry. Students relate learning experiences to state and national standards in science.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Department permission required.

EDCE 42100 - Integrating the Curriculum through the Social Studies

This course is designed to provide prospective teachers with skills and understandings about how to integrate the curriculum through social studies. Prospective teachers will learn how to help children inquire about the world around them utilizing all available materials and resources (including technology) to plan extended studies that integrate the disciplines. Special attention will be given to learning how to utilize students' diverse ethno-cultural backgrounds as a learning resource; how to create a productive and respectful community of learners in the classroom; how to embed the New York State Learning Standards in curricular work, utilizing a range of disciplines; and how to use research, geography, and technology skills to enhance students' learning.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Department permission required.

EDCE 42300 - Literacy: Fluent to Experienced

The nature of literacy acquisition and development, and the relationship between the language of children and the language of textual discourse. Focus on assessment, motivation, instructional strategies, classroom environment, and evaluation of instruction.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Department permission required.

EDCE 45400 - Teaching English as a Second Language

Methods and materials useful in teaching English to non-native speakers in elementary schools; applicability of modern structural studies of the language to such teaching; appropriateness of various techniques and aids for different age levels.

Credits: 3. Contact Hours: 3 hr./wk.

EDCE 45500 - Classroom Based Inquiry in Bilingual Education

Students will spend 60 hours for a total of 15 weeks in a school working in one bilingual classroom. Students will be expected to teach and plan literacy/language lessons, activities and units for these students.

Credits: 3. Contact Hours: 3 hr./wk.

EDCE 45600 - Teaching Content (Math, Science, and Social Studies) Using Both English and a Native Language

This fifteen-hour weekend seminar is designed to develop an interdisciplinary approach to teaching Math, Science, and Social Studies using both English and a native language (e.g., Chinese, Haitian, and Spanish). Prospective bilingual teachers will be provided with knowledge, interdisciplinary content skills, and specific language-related skills on how to use available materials and resources (i.e., standard glossaries and curriculum guides) when planning and integrating content-area learning experiences and/or interdisciplinary thematic units, using both English and one of the native languages specified above.

Credits: 3. Contact Hours: 3 hr./wk.

EDCE 45800 - Student Teaching in Bilingual Childhood Education

The student teaching experience is designed to provide prospective childhood teachers with opportunities to teach and critically analyze teaching practices in monolingual and bilingual classrooms. Students will: develop and improve teaching practices and organizational skills; practice the use of two languages to meet the academic, cognitive and emotional needs of all students; practice formal and informal assessment techniques; examine special features of classroom management in the bilingual classroom; develop awareness of the many ways in which the classroom, home and community environment are supportive of the learner. 300 hours

Credits: 4. Contact Hours: 6 hr./wk. Corequisite: EDCE 41600, EDUC 41900.

EDSE - Secondary Education Course Descriptions

EDSE 20500 - Intro Computing Tech

Credits: 3. Contact Hours: 5 hours

EDSE 32300 - Curriculum Development in Art

This course introduces students to curriculum development and assessment strategies in visual art education. Students will learn to analyze and design their own visual art curricula materials and accompanying assessment tools. This course includes 30 hours of observation in an arts education setting.

Credits: 4. Contact Hours: 3 hours

EDSE 32500 - Special Issues for Secondary School Teachers: Literacy and ESL

This hybrid undergraduate level course is a core requirement of all secondary education candidates, providing you opportunities to consider essential issues in literacy development and second language acquisition, and to deliberate about tensions within each area. The course is designed to provide a general introduction to these areas, focusing on issues of particular concern to middle and secondary school teachers, from which you will begin to consider how to differentiate your instruction for a diverse population of students. In turn, the course design is intended to help you create the kinds of classrooms our students deserve, using methods to deliver instruction that are aligned to the needs of these learners.

Credits: 2. Contact Hours: Includes 10 hours fieldwork 2hr./wk

EDSE 41200 - Teaching Reading and Writing in Secondary School Subjects

For prospective teachers in secondary school subject areas. Explore the roles of reading and writing in supporting learning across the curriculum. Current research and theory will be discussed and methods of incorporating literacy activities will be developed. (Not required for Biology, Chemistry, Earth Science, or Physics).

Credits: 3. Contact Hours: Includes 10 hours fieldwork. 3 hr./wk.

EDSE 41300 - Methods of Teaching Writing and Reading in Spanish in Secondary Schools

This course explores theories and methods of teaching writing and its connections to reading, speaking and listening as part of the Spanish classroom and across the curriculum in the secondary school. Candidates will develop an awareness of themselves as writers as they explore authentic purposes for writing and develop their craft in basic genres (personal and academic writing in Spanish). Includes 15 hours of fieldwork.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100, SPAN 32200 and SPAN 37300.

EDSE 41400 - Teaching Reading and Writing in the ELA Classroom

This course introduces undergraduate English Language Arts teacher candidates to research on best practices for teaching reading and writing, including collaborative work, the workshop model, reading fiction and informational texts, and composing narrative and expository texts. Includes 10 hours of fieldwork.

Credits: 3. Contact Hours: 3 hr./wk.

EDSE 44100 - Methods of Teaching English in Secondary Schools

Since English classrooms emphasize the complex interactions between reading, writing, listening, and speaking, this course, required for all English Education students, explores the pedagogical theories, teaching practices, and curriculum trends confronting English teachers today. The course work facilitates the move from student to teacher with increased ease, interest, knowledge, and professionalism. Includes 30 hours of fieldwork. Advance approval required.

Credits: 4. Contact Hours: 3 hr./wk.

EDSE 44200 - Methods of Teaching Secondary School Social Studies

Principles and methods of teaching social studies in secondary schools. Students will see these principles and methods in use in as part of their 10 hours of fieldwork experience. Topics include: lesson planning, classroom management, co-operative learning, questioning, remediation, enrichment, motivation, assigning homework, testing and assessment, reading in social studies, writing and note taking in social studies, problem solving, an overview of the secondary school curriculum in social studies, the use of technology in the secondary school curriculum, teaching methodology for students with special needs, methodology used for students learning English as a second language, literacy in the social science area classroom. Includes 30 hours of fieldwork.

Credits: 4. Contact Hours: 3 hr./wk.

EDSE 44300 - Methods of Teaching Secondary School Science

Principles and methods of teaching science in secondary schools. Topics include: lesson planning, classroom management, co-operative learning, questioning, remediation, enrichment, motivation, assigning homework, testing and assessment, problem solving, an overview of the secondary school curriculum in science, the use of technology in the secondary school curriculum, teaching methodology for students with special needs, methodology used for students learning English as a second language, literacy in the science-area classroom. Includes 30 hours of fieldwork.

Credits: 4. Contact Hours: 3 hr./wk.

EDSE 44301 - Adolescent Learning of Science Education

This course extends fieldwork experiences and to connects them to current research into the theories and practices of student learning. Students will conduct a lesson. This will be videotaped and critiqued during the seminar, providing an opportunity for the students to address adolescent learning theory in the context of actual classroom practice. Includes 10 hours of fieldwork.

Credits: 1. Contact Hours: 1 hr/wk. Corequisite: EDSE 44300.

EDSE 44400 - Methods of Teaching Art

This course focuses on teaching art in multiple settings with attention to learning goals, studio and discussion techniques, and assessment tools. Discussions about the nature of learning in the arts prepare students to develop arts lesson plans and effective teaching strategies. Includes 30 hours of fieldwork.

Credits: 4. Contact Hours: 3 hr./wk.

EDSE 44500 - Methods of Teaching in Secondary Schools: Spanish

In this course, candidates will explore the pedagogical theories, teaching practices and curricular trends of Spanish as a foreign and as a heritage language. Topics include assessment and evaluation of students, co-operative learning, lesson-planning, and the use of technology in the classroom. Emphasis will be placed in the teaching of reading and writing as it relates to the different levels of Spanish development and proficiency of the students. Differentiated planning and teaching will be part of the course.

Credits: 4. Contact Hours: Includes 30 hours of fieldwork 3 hr/wk.

EDSE 44600 - Methods of Teaching Secondary School Mathematics

Principles and methods of teaching mathematics in secondary schools. Students will see these principles and methods in use in as part of their 30 hours of fieldwork experience. Topics include: lesson planning, classroom management, co-operative learning, questioning, remediation, enrichment, motivation, assigning homework, testing and assessment, reading in mathematics, writing and note taking in mathematics, problem solving, an overview of the secondary-school curriculum in mathematics, the use of technology in the secondary-school curriculum, teaching methodology for students with special needs, methodology used for students learning English as a second language, literacy in the mathematics-area classroom.

Credits: 4. Contact Hours: Includes 30 hours of fieldwork. 3 hr./wk.

EDSE 44700 - Methods of Teaching Music

Principles and practices of teaching music in elementary and secondary schools with special reference to learning standards, objectives, techniques, and assessment. Analysis of music curriculum; curriculum planning.

Credits: 3. Contact Hours: 3 hr./wk. plus 10 hours field work

EDSE 45101 - Development of the Secondary School: Philosophy, Urban Issues and Curriculum Development in Secondary School English

History, philosophy and role of education. Evolution of high school curricula; instructional planning and multiple research-validated-instructional strategies for teaching within the full range of abilities. Adapting curricula for students with special needs/second-language-learning students. Literacy development by native-English speakers and English-language learners. Using technology in the curriculum.

Credits: 4. Contact Hours: Includes 30 hours of fieldwork. 3 hr./wk.

EDSE 45102 - Development of the Secondary School: Philosophy, Urban Issues and Curriculum Development in Secondary School Social Studies

The history, philosophy and role of education; the evolution of the social studies curriculum; instructional planning and multiple research-validated-instructional strategies for teaching within the full range of abilities; adapting the curriculum for students with special needs and second-language-learning students; literacy development by native-English speakers, as well as English-language learners; the use of technology in the curriculum.

Credits: 4. Contact Hours: Includes 30 hours of fieldwork. 3 hr./wk.

EDSE 45103 - Development of the Secondary School: Philosophy, Urban Issues and Curriculum Development in Secondary School Science

The history, philosophy and role of education; the evolution of the science curriculum; instructional planning and multiple research-validated-instructional strategies for teaching within the full range of abilities; adapting the curriculum for students with special needs and second-language-learning students; literacy development by native-English speakers, as well as English-language learners; the use of technology in the curriculum. Includes 30 hours of fieldwork.

Credits: 4. Contact Hours: 3 hr./wk.

EDSE 45104 - Development of the Secondary School: Philosophy, Urban Issues and Curriculum Development in Secondary School Mathematics

The history, philosophy and role of education; the evolution of the mathematics curriculum; instructional planning and multiple research-validated-instructional strategies for teaching within the full range of abilities; adapting the curriculum for students with special needs and second-language-learning students; literacy development by native-English speakers, as well as English-language learners; the use of technology in the curriculum.

Credits: 4. Contact Hours: Includes 30 hours of fieldwork. 3 hr./wk.

EDSE 45105 - Curriculum Development in Secondary School Spanish

An exploration of the variables, values, and assumptions that influence the practice of middle and high school foreign language curriculum design. Topics include the alignment of standards and instructional goals; contextualized instruction and assessment; and how to design and implement a curriculum that addresses the three modes of communication, cultural competence, and literacy development. The culminating project of this class is a self-designed unit plan informed by the semester's inquiry.

Credits: 4. Contact Hours: Includes 30 hours of fieldwork. 3hr./wk.

EDSE 46300 - Student Teaching in Middle and Secondary Education

Students will be assigned, under supervision, to a middle and/or secondary school as student teachers for a minimum of 300 hours. These hours are subject to regulations currently in force in the school system. Open only to matriculants. Advance approval by the program director required.

Credits: 4. Corequisite: EDSE 46301 and EDUC 41900.

EDSE 46301 - Seminar on Student Teaching in Secondary Schools

This course provides an opportunity for Undergraduate Secondary Education candidates to reflect about their student teaching experiences and a forum to discuss relevant issues in education. Topics include: Literacy; Planning for Instruction, Differentiated Instruction; Classroom Management; Grading and Assessment (including assessment of teaching); and Home-School-Community Connections. Candidates will compile a portfolio that documents their growth as a teacher. May be repeated one time with faculty approval.

Credits: 2. Contact Hours: 2 hr/wk. Corequisite: EDSE 46300, EDUC 41900.

EDSE 46400 - Student Teaching in Arts Education (P-12)

Students will be assigned as student teachers, under supervision, to grades P-6 and 7-12 schools for a minimum of 300 hours. Open only to matriculates. Advance approval required.

Credits: 4.

EDSE 46500 - Student Teaching in the High School (Spanish 7-12)

Students must be in their assigned schools for a two hour block of time five days per week for seventeen consecutive weeks.

Credits: 4. Contact Hours: 10 hr./wk.

EDSE 46600 - Seminar on the Teaching of Spanish and Literacy in Secondary Schools

Designed to explore the secondary schools' teaching of Spanish to native speakers and foreign language learners, with emphasis on developing oral, and literacy skills among secondary schools students. Curricula, literature and related language learning technologies, programs, methods, tests and diverse assessment and evaluation instruments will be studied.

Credits: 2. Contact Hours: 2 hr./wk.

EDUC - Teaching, Learning & Culture Course Descriptions

EDUC 20500 - Adolescent Learning and Development

How theories and research on learning and development manifest themselves in urban settings for teachers of adolescents. Teacher-centered and student-centered, human and technology-based approaches promoting independent, self-regulated adolescent learners. Cultural implications and classroom applications: learning, intelligence, motivation, affect, parenting styles, and development (cognitive, social moral), classroom communication and management strategies. Fieldwork activities in exemplary junior high and high school classrooms structured to meet State standard and to help prepare students to pass the ATS-W/EAS examination.

Credits: 3. Contact Hours: 3 hr./wk.; plus 15 hours fieldwork

EDUC 20600 - Obsrv Chldrn & Devl

This course is grounded in the notion that how children think, how their language develops, and how their families, their culture, and their environment influences and shapes them affect how they learn in school. Salient themes explored include the child as a maker of meaning, the nature of intelligence, attachment, gender identification, and the social context of development (i.e., race, culture, and class).

Credits: 3. Contact Hours: 3 hours

EDUC 22100 - Urban Schools in a Diverse American Society

The social context of schooling. An inquiry into the philosophy, history, sociology, quality, immigration, and the education of children from non-dominant cultures. Digital technology will be used as much as possible in data gathering. (Students may not receive credit for both EDUC 22100 and EDCE 22200.)

Credits: 3. Contact Hours: Includes 15 hours of fieldwork. 3 hr./wk.

EDUC 22200 - Schl Amer Soc Blng

Analysis of selected social, political and economic forces that influence the school as an institution, and in turn are influenced by the school, especially in urban settings. Special attention to immigrant, bilingual and language minority groups. (Students may not receive credit for both EDUC 22100 and EDUC 22200.)

Credits: 3. Contact Hours: 3 hours

EDUC 31000-31004 - Independent Study in Education

May be elected under three different options. Approval of faculty sponsor and appropriate department chair must be obtained during the preceding term.

Option A: Research: a scholarly and systematic investigation (empirical, historical or descriptive) culminating in a written report.

Option B: Service: intensive participation in a school or community project, provided the individual's roll, responsibility or contribution can be identified.

Option C: Reading: a scholarly and systematic review of literature in an area, culminating in a written report.

Credits: 1-4.

EDUC 41900 - Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics

This course has seven workshops that cover the following topics: Child Abuse Identification; School Violence Prevention; Dignity for All Students Act (DASA); NYCDoE's Teacher Application procedures and Career Development with our NYCDoE recruiter; Setting up your NYSED TEACH account; Resume Writing & Interviewing Skills with the Assistant Director of the CCNY Career and Professional Development Office; Presentation by the United Federation of Teacher's (UFT) Director of Appointments and Licensing.

Credits: 0. Contact Hours: 30 hr./sem. Corequisite: EDCE 41500, EDCE 41800.

EE - Electrical Engineering Course Descriptions

EE 20500 - Linear Systems Analysis I

Laplace transform, s-domain circuit analysis, network functions, frequency response. Fourier series and Fourier transform. Parseval theorem.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGR 20400 and ENGR 10300; Pre/Co-requisite: Math 39100(min. C grade).

EE 21000 - Switching Systems

Analysis and synthesis of combinatorial circuits. Karnaugh maps. Analysis and design of sequential circuits. Digital computer and industrial applications.

Credits: 3. Contact Hours: 3 hr./wk. Corequisite: MATH 20200 (min. C grade).

EE 22100 - Electrical Engineering Laboratory I

Experiments and design problems based on material drawn from the electrical engineering (ENGR 20400, EE 21000, EE 24100, EE 34200). Test and measurement instruments, Virtual instruments and computer instrumentation, Electric and electronic circuits. Transient and frequency response, Logic circuits, Logic circuits, Discrete circuits. Operational amplifiers.

Credits: 1. Contact Hours: 3 lab hr./wk. Prerequisite: ENGR 20400, EE 21000; pre-or coreq: ENGR 10300.

EE 24100 - Electronics I

Electronic devices and their use in analog circuits.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 20800 (min. C grade); pre- or coreq.: EE 20500 and EE 21000.

EE 25900 - Programming for Electrical Engineering

Part I. C++ and UNIX: UNIX preliminaries, C++ program format, data types, file I/O classes, overload operators, inheritance. Part II. Electrical engineering applications: projects on numerical solutions of linear equation systems, numerical differentiation/integration, least square approximations, etc.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: CSC 10200, ENGR 10300; pre- or coreq.: MATH 39100 (min. C grade), MATH 39200 (min. C grade).

EE 30600 - Linear Systems Analysis II

Discrete-time signals. Discrete-time systems. Linear, shift-invariant discrete-time systems. Convolution. The Z-transform. Transfer functions. The Fourier transform. Fourier analysis of discrete-time systems. Sampling in the time and frequency domains.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 20500.

EE 31100 - Probability and Statistics

Sample space and probability theory. Density and distribution functions of single and multiple discrete and continuous random variables. Functions of random variables. Expectation, variance and transforms. Independence, covariance and correlation. Central limit theorem, weak/strong law of large numbers. Introduction to random processes. Confidence intervals, hypothesis testing, simple linear regression techniques, chi-square minimization methods.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MATH 20300 (min. C grade).

EE 31200 - Communication Theory

Amplitude modulation, frequency modulation, noise in amplitude modulation systems, noise in frequency modulation systems, analog to digital conversion, digital modulation techniques.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 20500 and EE 31100.

EE 32200 - Electrical Engineering Laboratory II

Experiments and design problems based on material drawn from the electrical engineering (ENGR 20400, EE 21000, EE 24100, EE 34200). Test and measurement instruments, Virtual instruments and computer instrumentation, Electric and electronic circuits. Transient and frequency response, Logic circuits, Logic circuits, Discrete circuits. Operational amplifiers.

Credits: 1. Contact Hours: 3 lab hr./wk. Prerequisite: EE 22100, EE 24100.

EE 32300 - Electrical Engineering Laboratory III

Experiments and design problems based on material drawn from the electrical engineering (ENGR 20400, EE 21000, EE 24100, EE 34200). Test and measurement instruments, Virtual instruments and computer instrumentation, Electric and electronic circuits. Transient and frequency response, Logic circuits, Logic circuits, Discrete circuits. Operational amplifiers.

Credits: 1. Contact Hours: 3 lab hr./wk. Prerequisite: EE 32200, EE 34200.

EE 33000 - Electromagnetics

Complex vectors. Maxwell's Equations. Boundary conditions. Wave equations. Uniform plane waves. Polarization. Propagation in lossless and lossy media. Poynting vector. Reflection and transmission of waves at normal and oblique incidence. Transmission lines (propagation, Smith chart, transients). Topics in waves. Electrostatic magnetic fields. Electrostatic forces and energies.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 20800 (min. C grade), MATH 39100 and MATH 39200 (min. C grade).

EE 33300 - Introduction to Antennas, Microwaves and Fiber Optics

Fundamental understanding in theory and applications of microwaves, waveguides, and antenna for wired and wireless communication and power transfer. Understanding of applications drawn from technologies: optical fibers, satellite communication, biomedical sensing safety, microwave ovens, and RFID. Topics include: Review of EM waves propagation in free space and transmission lines. Fundamental concepts, structures, and advantages of various transmission media and technologies. Structures of conducting and dielectric waveguides. Cavity resonators. Radiation fields of dipoles. Antenna patterns and parameters. Linear antenna. Antenna arrays. Receiving antenna, and various antenna designs and applications.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 33000.

EE 33900 - Semiconductor Materials and Devices

The crystal structure of solids. Introduction to quantum mechanics and quantum theory of solids. Charge carriers in semiconductors. Carrier transport phenomena. Carrier generation and recombination. Mathematical analysis of diffusion phenomena. Ambipolar transport. Surface effects. Basic structure of the pn junction.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 33000, PHYS 32300.

EE 34200 - Electronics II

Electronic devices and circuits. Feedback amplifiers, oscillators. Comparators and Schmitt triggers. Differential amplifiers and operational amplifiers.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 24100.

EE 34400 - Digital Computer Systems

Digital system description. Algorithmic processor design. Organization of a simple digital computer. Control unit design, microprogramming. Elements of programming. General CPU, memory, and input/output organization. Microcomputer organization.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 21000, pre or coreq.: EE 25900.

EE 35700 - Electric Power Engineering

Analysis of magnetic circuits. Equivalent circuits and operations of power transformers, autotransformers, three-phase transformers. Basic principles of electromechanical energy conversion, single and double excitation. Elementary power systems and per-unit calculations. Power transmission, distribution, three-phase induction machines.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 20500, EE 33000.

EE 37100 - Linear Feedback Systems

Analysis of feedback systems including block diagrams, signal flow graphs, time domain specifications, Routh's stability criterion, root locus, Bode and Nyquist diagrams, and state feedback.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 20500, MATH 39100, and MATH 39200 (min. C grade).

EE 42100 - Local Area Network Laboratory

Introduction to computer networks: local area network, wide-area network and interconnected network; packet switching and circuit switching. Design and simulation of various networks. Measurements and control of performance parameters such as throughput, delay and call blocking rate. Networks and services for simulations include datagram and virtual circuit (WAN), Ethernet and Token Bus (LAN).

Credits: 1. Contact Hours: 3 lab hr./wk. Prerequisite: EE 22100. Corequisite: EE 46000.

EE 42200 - Analog Communication Laboratory

Analog communication systems, including frequency translation, AM signal generation and reaction, double and single sideband modulation,

FM signal bandwidth, narrow and wide angle modulation, FM signal generation and reception, frequency division multiplexing, and noise in FM.

Credits: 1. Contact Hours: 3 lab hr./wk. Prerequisite: EE 22100. Corequisite: EE 31200.

EE 42500 - Computer Engineering Laboratory

Introduction to the operation and applications of microcomputers and design experiments in computer interface engineering utilizing a microprocessor-based computer. Design projects include computer input-output device selection, program interrupt, on-line control, direct memory access, and circular input-output buffer.

Credits: 1. Contact Hours: 3 lab hr./wk. Prerequisite: EE 32200, Pre-/Coreq.: EE 34400 (or CSC 21000 and CSC 34200).

EE 42600 - Control Laboratory

Experiments dealing with the operation and performance of feedback control systems. Study some aspects of feedback control systems, such as stability, transient analysis, and system performance. Build different controllers such as constant gain controllers, controllers with velocity feedback, and PID controllers. Compare these controllers in terms of transient analysis and system performance.

Credits: 1. Contact Hours: 3 lab hr./wk. Prerequisite: EE 22100. Corequisite: EE 37100.

EE 42800 - Photonics Engineering Laboratory

Hands-on approach to optical systems and photonics applications including: 1) refraction, diffraction, and imaging; 2) computer-aided photonics system design; 3) holography; 4) introduction to fiber-optics; 5) spectroscopy. Students are required to complete at least three out of the five units.

Credits: 1. Contact Hours: 3 lab hr./wk. Prerequisite: EE 33000.

EE 43800 - Management Concepts for Engineers

The principles and techniques of team management in a high-technology environment. Concepts in developing leadership and entrepreneurial skills as well as communication skills in a business context. A term paper will be required.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: At least upper junior status.

EE 44100 - Electronic Devices and Semiconductor Materials

Fundamental properties of semiconductors. Simple device fabrication, physical principles of the "p-n" junctions, metal-semiconductor junctions, the Schotky-barrier diode, the bipolar transistor (BJT), the field effect transistor, the MOS transistor, CMOS technology.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 33900.

EE 45100 - Communication Electronics

Components of end-to-end communications systems. Noise in circuits and systems. Behavior of wideband and tuned amplifiers; limits on small signal operation. Gain controlled amplifiers, limiters, frequency multipliers, oscillators, coupling networks. Nonlinear elements, distortion, amplitude, frequency, and phase modulators, transmitters and low-noise receivers.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 31200 and EE 34200.

EE 45200 - Fiber Optic Communications

This course is intended to provide the basic materials for an introductory senior or first-year graduate course in the theory and application of optical fiber communication technology with emphasis on both digital and analog point-to-point very-high-bit-rate long haul optical transmission systems. Topics covered include: an overview of the fundamental components of advantages of optical fibers relative to other transmission media; basic laws and definitions of optics that are relevant to optical fibers; degradation of light signals arising from attenuation and distortion mechanisms; main devices encountered in a

fiber optic system, light sources, light detectors. Analog and digital modulation formats at the transmitter: theory and design of receivers, noise and detection for optical fiber links; performance analysis and design of both digital and analog point-to-point very high bit-rate long-haul optical transmission systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 31200, EE 33300, EE 44100.

EE 45300 - Digital Signal Processing

Introduction to basic digital signal processing concepts; the finite Fourier transform, cyclic convolution, digital filters, Z-transform. Design of algorithms computing the finite Fourier transform and cyclic convolution. Cooley-Tukey and Winograd algorithms.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 30600.

EE 45400 - Physical Electronics

Theory of metals, crystal structure, classification of lattices, x-ray diffraction, periodic potentials and energy bands, statistical physics and charge carrier concentration profiles, multiband effective mass theory, electron-photon interactions, electron-phonon interactions, electronic and optical effects in nanostructures, optoelectronic device applications.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 33900.

EE 45500 - Elements of Power Systems

Analysis of transmission lines, transformers, and electric machines as the elements of power systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 35700.

EE 45600 - Elements of Control Theory

Design of classical and state space controllers for continuous time and sampled data systems. Lead, lag, and lag-lead compensation. State feedback, separation theorem, reduced order estimators. Lead compensation using w-plane. Discrete equivalent state space models. Deadbeat response.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 37100.

EE 45700 - Digital Integrated Circuits

Design of logic circuits: CMOS, Pseudo-nMOS, and high-performance circuits, such as dynamic pre-charge circuits and clocked CMOS, etc. Design of flip-flops and memories at the transistor level. Design of arithmetic circuits, I/O circuits, registers and control circuits, as well as analysis of digital circuit characteristics.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 24100.

EE 45800 - Introduction to Lasers

Resonant optical cavities. Amplification by an atomic system. Conditions for oscillation. Homogeneous and inhomogeneous systems. General characteristics of lasers. Generation of short pulses: Q-switching and mode locking. Semiconductor lasers. Rare earth lasers. Gas lasers. Fiber lasers. Laser applications.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 33300, EE 33900.

EE 45900 - Microprocessors

Introduction to stored program computers and microcomputers. Reviews of number systems, binary arithmetic, register transfer language, and micro-operations. Digital computer and microcomputer functional elements, input-output devices, system organization and control. Accumulator-based processors, general register processors. Linear pipelining and cache memory.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 34400.

EE 46000 - Computer Communication Systems

Queuing theory, packet, message and circuit switching networks, assignment of link capacities and flows, routing algorithms, flow control

and error control, multiple access schemes and OSI/ISO network protocols.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 31200.

EE 46200 - Photonic Engineering

Study of basic optics and computer-aided design for optics. Application of study to solve engineering problems and design photonic devices. Topics will be selected from: ray tracing; lens design; interferometry; analysis of optical systems; spectroscopic techniques; Fourier optics; fibers, waveguides, integrated optics; video disk; optical detectors.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 33300.

EE 46300 - Wireless Communications

Introduction to wireless/mobile communications systems. Cellular systems concept: frequency reuse, co-channel and adjacent channel interference, capacity improvement. Wireless channel characteristics: long-term fading, short-term fading. Diversity techniques: DPSK, QPSK, 4QPSK, QAM, GMSK. Multiple access techniques for wireless communications: FDMA, TDMA, CDMA. Personal communications services. Current standards of PCS and cellular systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: EE 31200.

EE 46400 - VLSI Design

Introduction to CMOS circuits, CMOS processing technology and physical characterization of gates, clocking strategies, I/O structures, and structured design concepts. The student will design, simulate, and lay out mask description of digital CMOS VLSI circuits. The design will be simulated using SPICE and RSIM. Circuit layout is created using MAGIC software package. The circuit will be fabricated by the foundry service supported by NSF/DARPA and tested. A final report detailing all the work is required.

Credits: 3. Contact Hours: 2 class, 3 lab hr./wk. Prerequisite: Pre-or coreq: EE 45700.

EE 47100 - Introduction to Digital Image Processing

Introduction to fundamental technologies for digital image and video representation, analysis, processing and compression (MPEG, JPEG etc). Topics include digital image/video perception, sampling, optimal quantization, transform, filtering, multi-spectral processing, restoration, feature extraction, morphological transform, image compression (lossy and lossless), video compression (lossy and lossless), and latest applications.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGR 10300 & EE 30600 or CSC 47000

EE 51000 - Independent Study

The student pursues a program of independent study under the direction of a faculty mentor. Open only to students who have shown exceptional ability (minimum GPA 3.5). Students desiring to register in this course should apply by Dec. 1 for the spring term and by May 1 for the fall term. A final report is required.

Credits: 1 or 3. Contact Hours: 3 hr./wk. Prerequisite: Departmental approval.

EE 59866 - Seminar Design 1 for Electrical Engineering

This is a two-semester capstone design course. The student is required to design and implement a solution to an engineering project. Topics include introduction to engineering design, identification of a problem, background research, social, environmental, ethical and economic considerations, intellectual property and patents and proposal writing, including methods of engineering analysis and theoretical modeling. A detailed concept and design proposal is completed during the first semester and the implementation phase may also begin. A functional physical prototype or computer model is completed and tested in the second semester. Each student is required to write an in depth engineering report and to make an oral presentation to the faculty.

Credits: 3. Contact Hours: 3 class, 3 design hr./wk. Prerequisite: EE 25900, EE 30600, EE 31200, EE 32200, EE 33900, EE 34400, and EE 42500.

EE 59867 - Seminar Design 2 for Electrical Engineering

This is a two-semester capstone design course. The student is required to design and implement a solution to an engineering project. Topics include introduction to engineering design, identification of a problem, background research, social, environmental, ethical and economic considerations, intellectual property and patents and proposal writing, including methods of engineering analysis and theoretical modeling. A detailed concept and design proposal is completed during the first semester and the implementation phase may also begin. A functional physical prototype or computer model is completed and tested in the second semester. Each student is required to write an in depth engineering report and to make an oral presentation to the faculty.

Credits: 3. Contact Hours: 3 class, 3 design hr./wk. Prerequisite: EE 59866.

EE 59868 - Senior Design 1 for Computer Engineering

This is a two-semester capstone design course. The student is required to design and implement a solution to an engineering project. Topics include introduction to engineering design, identification of a problem, background research, social, environmental, ethical and economic considerations, intellectual property and patents and proposal writing, including methods of engineering analysis and theoretical modeling. A detailed concept and design proposal is completed during the first semester and the implementation phase may also begin. A functional physical prototype or computer model is completed and tested in the second semester. Each student is required to write an in depth engineering report and to make an oral presentation to the faculty.

Credits: 3. Contact Hours: 3 class hr., 3 design hr./wk. Prerequisite: EE 32200 Corequisite: EE 42500.

EE 59869 - Senior Design 2 for Computer Engineering

This is a two-semester capstone design course. The student is required to design and implement a solution to an engineering project. Topics include introduction to engineering design, identification of a problem, background research, social, environmental, ethical and economic considerations, intellectual property and patents and proposal writing, including methods of engineering analysis and theoretical modeling. A detailed concept and design proposal is completed during the first semester and the implementation phase may also begin. A functional physical prototype or computer model is completed and tested in the second semester. Each student is required to write an in depth engineering report and to make an oral presentation to the faculty.

Credits: 3. Contact Hours: 3 class hr., 3 design hr./wk. Prerequisite: EE 59868.

ENGL - English Course Descriptions

ENGL 11000 - Freshman Composition

The longer paper, and practice in essay forms. This course may be used under the F policy to repeat the Writing course in FIQWS.

Credits: 3. Contact Hours: 3 hr./wk., plus conf.

Engl 15500 - American Literature

This one-semester survey introduces students to important writers, themes, and forms of American literary expression from the age of exploration to the present. Both close textual analysis and attention to historical context will be emphasized. By reading diverse texts from the colonial to the postmodern period, students will learn how tensions within the dominant culture and between the dominant culture and marginalized populations have shaped American identity and literature.

Credits: 3. Offered: 3 hr./wk..

ENGL 21000 - Introduction to Academic Writing

Practice in the styles and forms of expository writing required in specific disciplines. Readings that acquaint students with standards of good writing in their field.

Credits: 3. Contact Hours: 3 hr./wk., plus conf. Prerequisite: ENGL 11000, or exemption from it on the basis of the placement test.

ENGL 21001 - Writing for Humanities and the Arts

Credits: 3.

ENGL 21002 - Writing for the Social Sciences

Credits: 3.

ENGL 21003 - Writing for the Sciences

Credits: 3.

ENGL 21007 - Writing for Engineering

Credits: 3.

ENGL 22000 - Introductory Workshop in Creative Writing

For students who wish to explore the various areas of creative writing. May be taken twice for credit.

Credits: 3. Contact Hours: 3 hr./wk.

ENGL 22100 - Intermediate Creative Writing: Reading as Writers

This intermediate creative writing workshop focuses on the continued improvement of student writing through reading and discussing models in literature. These may include poems, short stories, essays, and plays. The emphasis of the course is on reading texts as writers, and discussion of craft, based on the work of a few published authors considered in depth. It operates with the belief that writers must read deeply and extensively in order to hone their work.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 22000.

ENGL 23000 - Writing Workshop in Prose

Emphasis on development of a prose style appropriate to a given disciplinary or work-world context. May be repeated for credit when focus varies.

Credits: 3. Contact Hours: 3 hr./wk., plus conf. Prerequisite: ENGL 21000.

ENGL 25000 - Introduction to Literary Study

A practical introduction to significant works of English, American, and Anglophone literature from the late Middle Ages to the present, with special attention to literary terms, concerns, and forms, and an emphasis on close reading and on the relation of text and context.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 25100-25400 - Historical Survey of British Literature

A series of courses surveying the history of British literature from the Middle Ages to the present. Students can one or all of the courses, either in or out of sequence.

Credits: 3. Prerequisite: WHUM 10101 OR WHUM 10200

ENGL 26000-26900 - Studies in Genre

A series of courses for beginning majors, introducing them to basic themes and principles of literary modes, forms, and genres, including multigenre and experimental formats. Courses include "Studies in Short Fiction"; "Studies in Confessional Poetry"; and "Studies in Contemporary Drama."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS or ENGL 11000. Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors. Corequisite: WHUM 101, WHUM 102, or WHUM 103.

ENGL 27000-27010 - Literatures of Diversity

A series of courses for beginning majors, introducing them to themes and issues surrounding discussion of writings from non-canonical or underrepresented groups. Topics include: "Immigrant Literature," "Queer Identity," and "Imagining Native Americans."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: WHUM 101, WHUM 102, or WHUM 103. Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 28000 - Introduction to Comparative Literature

Introduction to ways of comparing various literatures, with readings from literature around the world.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: WHUM 101, WHUM 102, or WHUM 103. Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 31001-31004 - Independent Study

Independent study and research under the supervision of a mentor.

Credits: 1-4.

ENGL 31003 - Independent Study: Publishing Internship

This course is the final requirement towards the Publishing Certificate and is available to those students who have completed four courses in the Program with a 3.0 average or better. Publishers offering internships include: Random House, Inc., John Wiley and Sons, Inc., Time Warner Books, W.W. Norton, Inc., Simon and Schuster, Inc., and HarperCollins. Students work in the department of their choice. An essay reviewing and analyzing the relationship between the students' academic and work experience is required.

Credits: 3. Contact Hours: 150 hrs. Prerequisite: Permission of the Director is required.

ENGL 31100-32000 - Selected Topics in Language and Literature

A changing series of innovative and experimental courses on topics not generally covered in regular courses. Students should consult the Department's course offerings booklet each semester to determine which selected topics courses will be offered.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 31134 - The Essay

"The essay" is potentially one of the most interdisciplinary, creative, and non-commercial of the literary genres. More than any other form, the essay requires that its practitioners articulate prior knowledge and personal experience, as well as incorporate research. Essay writers also hover between self-disclosure and objective argument, and must often bend language between storytelling and expository purposes. Students will also study experimental essays that challenge traditional thesis-plus-evidence essay structures interrogating the very notions of authority, linearity, and the stability of language itself.

Credits: 4. Contact Hours: 4hr/wk

ENGL 31809 - Home and Away: Literature of Immigration

Throughout the decades, whether in the U.S. or abroad - the literatures of immigration have provided a source of innovative writing, as well as an important voice in the debates concerning immigration policy. Through the use of various texts - literature, film, media, and legal documents - this course will explore the notion of identity, especially as it relates to the concepts of "home" and "homeland." Students will complement literary readings with comparative study of immigration policies of countries including the U.S., Canada and the United Kingdom.

Credits: 4. Contact Hours: 4hr/wk

ENGL 32000 - Workshop in Fiction

More advanced than ENGL 22100, for students who wish to concentrate on the writing of fiction. Reading and analyzing contemporary short stories, and writing stories that will be discussed in class with other students and in regular conferences. May be taken three times for credit.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 22100

ENGL 32100 - Workshop in Poetry

More advanced than ENGL 22100, for students who wish to concentrate on the writing of poetry. Regular conferences. May be taken twice for credit.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 22100.

ENGL 32200 - Workshop in Drama

More advanced than ENGL 22100, for students who wish to concentrate on the writing of drama. Work in both the one-act and full-length play forms. Student work will be the basis for class readings and discussions. Regular conferences. May be taken twice for credit.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 22100.

ENGL 32400 - Reading and Writing Children's Literature

This course investigates the essential aspects of writing for children, including: appropriate vocabulary, voice, audience, theme, style and technique. Both fiction and poetry are examined. Skills of editing, revision, and presentation are presented.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 22000

ENGL 32501 - Introduction to Publishing I

A dynamic overview of who does what and why in book publishing, providing broad knowledge of book acquisitions, editing, design and production, sales, marketing, advertising, corporate management, and the financial and legal professional areas of the industry.

Credits: 3. Contact Hours: 3 hr./wk.

ENGL 32502 - Publishing Practicum

A simulation of the complete book publishing process from contract negotiations to bound book. Designed to complement the fall-semester Introduction to *Publishing* by providing opportunities for students to put their previous learning to practical use.

Credits: 3. Contact Hours: 3 hr./wk Prerequisite: ENGL 32501.

ENGL 32514 - Introduction to Publishing

A dynamic overview of who does what and why in book publishing, providing broad knowledge of book acquisitions, editing, design and production, sales, marketing, advertising, corporate management and the financial and legal professional areas of the industry. This course is offered as a HYBRID and students must be prepared to use online resources and participate in weekly online discussions.

Credits: 4. Contact Hours: 4hr/wk

ENGL 32600 - Books for Young Readers

A practical look at the specialized world of publishing for children and young adults, with an emphasis on the creative passion involved in producing books for American young people. Licensing, merchandising, sales and marketing to all age groups and every category in publishing will be discussed. Substantial reading of children's titles and discussions of the development of publishing programs, with special focus on multicultural programs.

Credits: 3. Contact Hours: 3 hr./wk.

ENGL 32700 - The Editorial Process

An in-depth look at the process specific to the editorial profession, including book acquisition, manuscript editing (copyediting, line editing, proofreading); selling a manuscript at the editorial meeting;

author/agent/editor relations; book contracts and subsidiary rights; seeing a writer's project from concept to manuscript to bound book; the book review process; and the editor's relationship with the marketing, sales, and advertising departments. This course will include class visits by authors and industry professionals, who will explore their individual relationship to the process of book making. Students will acquire the basic skills and knowledge necessary to successfully enter a professional editorial position.

Credits: 3. Contact Hours: 3 hr./wk.

ENGL 32800 - Fundamentals of Copyediting and Proofreading

Intensive, practical instruction in basic copyediting and proofreading. Working with a variety of texts (including fiction, nonfiction, cookbooks, reference works), students will learn how to assess a manuscript and employ universal copyediting/ proofreading symbols in type-marking manuscripts. Students will also learn design coding; drafting a style sheet; querying; preparing a manuscript for author review and typesetting; composition quality standards; and how to perform the tasks at each stage of the bookmaking process.

Credits: 3. Contact Hours: 3 hr./wk Prerequisite: or coreq.: ENGL 32501.

ENGL 32900 - Independent Study: Publishing Internship

Students work a minimum of 150 hours in the department of their choice. An essay reviewing and analyzing the relationship between the student's academic and work experience is required. Publishers offering past internships include: Random House, Inc., John Wiley & Sons, Inc., Time Warner Books, W.W. Norton, Inc., Harcourt, Inc., Simon & Schuster, Inc., and Harper Collins.

Credits: 3. Contact Hours: 150 hrs. Prerequisite: Permission of the director.

ENGL 33000 - Crit Rdnng & Writ 1

A year long course providing a practical introduction to fundamental concepts and methods of literary analysis. The course begins with short texts and moves progressively to longer forms. Readings include poems, plays, novels and stories written in English (as well as examples of less strictly literary forms).

Credits: 3. Contact Hours: 3 hours

ENGL 34200 - Advanced Grammar

This course describes, reviews, and clarifies principles of English grammar and usage, particularly for Learning Center tutors and those who plan to teach English.

Credits: 3. Contact Hours: 3 hr./wk.

ENGL 35000 - Hist Approach-Lit 1

A year long course in English literature from the Middle Ages to the present.

Credits: 3. Contact Hours: 3 hours

ENGL 35100 - Hist Approach Lit 2

A year long course in English literature from the Middle Ages to the present.

Credits: 3. Contact Hours: 3 hours

ENGL 35200 - Representative British Writers of the Middle Ages

An introduction to the literature of the Middle Ages in England. Readings include narrative poetry and prose, religious writings, drama, and lyrics.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35201 - Old English

The language and literature of the Anglo-Saxons.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35202 - Chaucer: The Canterbury Tales

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35300 - Representative Writers of the Renaissance

An introduction to Renaissance literature. Readings include a variety of genres: poems, plays, epic, literary criticism, and fiction.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35301 - Shakespeare I

Early and middle comedies, major histories, early tragedies, poems, and sonnets.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35302 - Shakespeare II

The major tragedies, the problem plays, the late comedies, and romances.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite ENGL 25000 or another 200-level ENGL class.

ENGL 35303 - Shakespeare in Film

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite ENGL 25000 or another 200-level ENGL class.

ENGL 35304 - Seventeenth-Century English Poetry

Donne, Herbert, Jonson, the early Milton.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite ENGL 25000 or another 200-level ENGL class.

ENGL 35400 - Selected Topics in Medieval and Early Modern Literature

This series of courses provides students with the chance to study medieval or early modern literature in greater depth. Possible topics include: "Shakespeare on Film"; "Petrarchan Poetry; "Courtly Love."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 25000 or another ENGL elective at the 200 level. Corequisite: Another English elective at the 200-level.

ENGL 35500 - Representative British Writers of the Restoration and Eighteenth Century

An introduction to English Romantic poetry and prose. Readings include poetry, fiction, autobiography, philosophy, literary criticism, letters and personal journals from men and women of the period.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35501 - Milton

Paradise Lost and other major works.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35502 - The Eighteenth-Century English Novel

From the beginnings to Austen.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35600 - Representative British Writers of the Romantic Period

An introduction to English Romantic poetry and prose. Readings include poetry, fiction, autobiography, philosophy, literary criticism, letters, and personal journals from men and women of the period.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35700 - Representative British Writers of the Victorian Period

An introduction to Victorian literature through representative works in a variety of genres.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35701 - Nineteenth-Century British Novel

From Austen to Hardy.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35800 - Representative British Writers of the Modernist Period

An introduction to representative modern writers of England and Ireland.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite ENGL 25000 or another 200-level ENGL class.

ENGL 35802 - The Twentieth-Century British Novel

An introduction to representative British novelists from the twentieth century, including Woolf, Joyce, Orwell, Ford, and Conrad.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 35900 - Selected Topics in Eighteenth- and Nineteenth-Century British Literature

This series of courses provides students with the chance to study eighteenth- and nineteenth-century British literature in greater depth. Possible topics include: "The Eighteenth-century Novel"; "British Drama after Shakespeare," and "Victorian Theater."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 36000 - Representative Writers of the United States: Early American Literature

Literature of the Colonial and Revolutionary periods, including devotional literature, captivity narratives, slave narratives, political rhetoric, and the gothic and sentimental novel.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 36100 - Representative Writers of the United States: The Nineteenth Century

Embraces the antebellum period and the late nineteenth century: likely topics include Transcendentalism, literary nationalism, the literature of emancipation, and the cult of domesticity as well as post-Civil War developments in regionalism, realism, and naturalism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 36200 - Representative Writers of the United States: The Twentieth Century

Modern and contemporary American literature from the rise of modernism to postmodernist developments in the late twentieth century.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 36201 - Twentieth-Century American Poetry

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 36300 - Latino Literature in the U.S.

A one semester elective course on selected literature, from of a variety of genres, by contemporary Latino writers.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 36400 - Selected Topics in American Literature

This series of courses provides students with the chance to study American literature in greater depth. Possible topics include: "1930s Chicago," "The Civil War," "The Post-War Novel."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 25000. Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors. Corequisite: Another English elective at the 200-level.

ENGL 36500 - Selected Topics in Twentieth-century and Contemporary Literature

This series of courses provides students with the chance to study twentieth-century and contemporary literature in greater depth. Possible topics include: "Modern Drama," "Diaspora Literatures," "Bloomsbury."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 36600 - Selected Topics in Anglophone Literature

This series of courses provides students with the chance to study Anglophone literature in greater depth. Possible topics include: "Asian-American Literature," "Native Speakers," "Imagining India."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 36700 - Selected Topics in Literature of the Americas

This series of courses provides students with the chance to study the literature of the Americas in greater depth. Possible topics include: "Contemporary US Latino/a Literature," "Early Colonial Encounters," "Latina Writers."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 36800 - Selected Topics in Life Writing

This series of courses provides students with the chance to explore the genres of Life Writing in greater depth. Possible topics include: "The Memoir," "Biography," "Confessional Verse."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 36900 - Selected Topics in Language, Writing, and Rhetoric

This series of courses provides students with the chance to explore language, writing, and rhetoric in greater depth. Possible topics include: "Histories of Literacy," "Alternative Literacies," "Literacy and Education."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 37001 - African American Literature in America

A historical survey.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 37004 - African American Fiction

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 37006 - Comparative Africana Fiction

Africa, the United States, the Caribbean

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 37100 - Selected Topics in African-American Literature

This series of courses provides students with the chance to study African-American literature in greater depth. Possible topics include: "Jazz Fiction," "Detective Fiction," and "20th-century African Drama."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 37200 - Selected Topics in Literary Theory

This series of courses provides students with the chance to study a variety of theoretical approaches to literature. Possible topics include: "Literary Theory from Aristotle to Foucault," "Feminisms," "Queer Theory."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 37300 - Selected Topics in Literature and Psychology

This series of courses provides students with the chance for interdisciplinary study in literature and psychology. Topics include: "Repression and the Bildungsroman Tradition," "Shakespeare and Oedipus," "The Novel and Emotions."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 37400 - Selected Topics in Law and Literature

This series of courses provides students with the chance to explore the relationship between law and literature. Possible topics include: "Justice on Stage," "Crimes and Punishments," and "Juries of Her Peers: Women on Trial."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 37501 - Women Writers of the Middle Ages and the Renaissance

An historic and thematic examination of significant works by women of the Middle Ages and Renaissance, with consideration of related historical, social, and religious issues.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 37502 - Nineteenth-Century Women Writers

Austen, Eliot, the Brontes, and minor figures.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 37503 - Twentieth-Century Women Writers

Woolf, Bowen, Wharton, Glasgow, Moore, Lessing, Murdoch, Mansfield, Stein, Porter, McCullers, Welty, Plath, and others.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 37504 - Selected Topics in Gender and Sexuality

This series of courses provides students with the chance to study literary representations of gender and sexuality. Possible topics include: "Fairy Tales and Sexuality," "Rape and the Rise of the Novel," "Medieval Sexualities."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 37600 - Selected Topics in Literature and Performance

This series of courses provides students with the chance to study literature and performance in greater depth. Possible topics include: "Histories of English Theater," "Victorian Actresses," "Cross-dressing on the Early Modern Stage."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 37700 - Selected Topics in Literature and History

This series of courses provides students with the chance to explore the interrelationship of literature and history in greater depth. Possible topics include: "The Court of Elizabeth I," "The Early Modern Slave Trade," "Civil Rights Literature."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 37800 - Selected Topics in Literature and Politics

This series of courses provides students with the chance to study the interrelationships of literature and politics. Possible topics include: "Kinship and Kingship in Medieval Literature," "Revolution and Romanticism," "The Stage and Social Protest."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 37900 - Selected Topics in Literature and Science

This series of courses provides students with the chance to explore the interrelationships of literature and science. Possible topics include: "Darwin and Dickens," "Disease and the Early Modern Imagination," "The Female Malady."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 38003 - The Bible as Literature I

The Old Testament.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 38004 - The Bible as Literature II

The New Testament.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 38104 - Modern Drama I

Nineteenth century to 1914. Ibsen, Chekhov, Strindberg, Shaw, Synge.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 38105 - Modern Drama II

Since 1914.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 38200 - Selected Topics in Literature and Philosophy

This series of courses provides students with the chance to take up the interdisciplinary study of literature and philosophy. Possible topics include "The Hero as Nietzsche's Superman," "Language Games and Experimental Poetry," and "The Existential Novel."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or co-requisite: ENGL 25000 or another 200-level ENGL class. Corequisite: Another English elective at the 200-level.

ENGL 39000 - Genres

Studies of the forms and historical development of various literary genres.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 39001 - Satire

Credits: 3. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 39005 - Literary Criticism

Credits: 3. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 39006 - Science Fiction

Credits: 3. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 39100 - Themes

Consideration of various themes, ideas, literary patterns, and concepts in literature.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 39102 - The Vampire

An exploration of certain ideas of evil in Western literature.

Credits: 3. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 39105 - The Literature of Im/Migration

An introduction to the main themes of literature of Im/Migration, with the focus in particular on American literature. Readings will include novels, short stories, poetry, and memoirs as well as screening of film excerpts.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 39200 - Literature and Other Disciplines

The relationship of literature to spiritual and social forces, to science, and to art.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 39203 - The Political Novel

Credits: 3. Prerequisite: Students must, unless granted special permission, take composition before enrolling in literature electives. See Requirements for English Majors.

ENGL 41414 - Feminist Lit & Film

Credits: 3. Contact Hours: 2 hours, plus conf.

ENGL 41900 - Mythic Patterns

Credits: 3. Contact Hours: 2 hours, plus conf.

ENGL 45400 - Advanced Topics in Medieval and Early Modern Literature

This series of courses provides more advanced majors with the chance to study Medieval and Early Modern literature in greater depth, with reference to critical approaches. Possible topics include: "Shakespeare's Henriad," "The New World and the Globe," "Medieval Epic Poetry."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 45900 - Advanced Topics in 18th- and 19th-century British Literature

This series of courses provides more advanced majors with the chance to study 18th- and 19th-century British literature in greater depth, with reference to critical approaches. Possible topics include: "Revolution in Literature and Politics," "Austen and Her Contemporaries," "The Intercontinental Gothic."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 46400 - Advanced Topics in American Literature

This series of courses provides more advanced majors with the chance to study American literature in greater depth, with reference to critical approaches. Possible topics include: "The West," "Emily Dickinson," "Post-War Brooklyn."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 46500 - Advanced Topics in Twentieth-century and Contemporary Literature

This series of courses provides more advanced majors with the chance to study twentieth-century and contemporary literature in greater depth and reference to critical approaches. Possible topics include: "Black Writers in Britain," "Woolf and the Common Reader," "Joyce and Yeats."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 46600 - Advanced Topics in Anglophone Literature

This series of courses provides more advanced majors with the chance to study Anglophone literature in greater depth, with reference to

critical approaches. Possible topics include: "Modern Myths," "Arab Women Writers," "New African Writing."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 46700 - Advanced Topics in Literatures of the Americas

This series of courses provides more advanced majors with the chance to study the literature of the Americas in greater depth, with reference to critical approaches. Possible topics include: "Garcia Marquez and Modernism," "Caribbean Spirits, Colonial Ghosts," "Genealogies of Magical Realism."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 46800 - Advanced Topics in Life Writing

This series of courses provides more advanced majors with the chance to study Life Writing in greater depth, with reference to critical approaches. Possible topics include: "Remembered Childhoods," "Memoir as Political Action," "Trauma and Confession."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 46900 - Advanced Topics in Language, Writing, and Rhetoric

This series of courses provides more advanced majors with the chance to study language, writing, and rhetoric in greater depth, with reference to critical approaches. Possible topics include: "Rhetoric Ancient and Modern," "Recent Theories of Literacy," "Early Modern Women's Literacy and Illiteracy."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 47100 - Advanced Topics in African-American Literature

This series of courses provides more advanced majors with the chance to study African-American literature in greater depth, with reference to critical approaches. Possible topics include: "Hughes and the Harlem Renaissance," "Toni Morrison," "Mothers' Gardens: Hurston and Walker."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 47300 - Advanced Topics in Literature and Psychology

This series of courses provides more advanced majors with the chance to study literature and psychology in greater depth, with additional opportunities for research and writing. Possible topics include: "Persons and Things in Victorian Literature," "Early Modern Objects," "Matricide and Modernism."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 47400 - Advanced Topics in Law and Literature

This series of courses provides more advanced majors with the chance to study the interrelationship of law and literature. Possible topics include: "Antigone's Daughters: Women and Crime" and "The Novel and the Penitentiary."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 47500 - Advanced Topics in Gender and Sexuality

This series of courses provides more advanced majors with the chance to study issues of gender and sexuality in greater depth, with reference to critical approaches. Possible topics include: "Gender as Performances," "Sexuality on Stage," "Queer Film."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 47600 - Advanced Topics in Literature and Performance

This series of courses provides more advanced majors with the chance to study theater practice and theories of performance in greater depth.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 47700 - Advanced Topics in Literature and History

This series of courses provides more advanced majors with the chance to study the interrelationships of literature and history in greater depth, with reference to critical approaches. Possible topics include: "Jamestown Narratives," "The Great Depression," "Lincoln and Whitman."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 47800 - Advanced Topics in Literature and Politics

This series of courses provides more advanced majors with the chance to study the interrelationships of literature and politics in greater depth, with reference to critical approaches. Possible topics include: "The Irish Revolution," "The Rhetoric of Reconstruction," "Watergate."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 47900 - Advanced Topics in Literature and Science

This series of courses provides more advanced majors with the chance to study literature and science in greater depth, with reference to critical approaches. Possible topics include: "Mind and Body in Modern Literature," "The Frankenstein Myth," "The Ecological Novel."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 48200 - Advanced Topics in Literature and Philosophy

This series of courses provides more advanced majors with the chance to study the interrelationship of literature and philosophy in greater depth, with reference to critical approaches. Possible topics include: "The Banality of Evil," "The Discovery of the Individual," "The History of Consciousness."

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Two 300-level English electives.

ENGL 49000-49999 - Seminars in Language and Literature

An advanced opportunity for students who have completed at least 24 elective credits in the major, and wish to pursue interest in one writer, a group of writers, a literary subject, theme, or period in a more intensive way. Offerings change each term, and students should consult the Department's course offerings booklet each semester to determine which seminars will be given.

Credits: 3. Contact Hours: 2 hr./wk. plus conf.

ENGL 49000-49999 - Seminars in Language and Literature

An advanced opportunity for students who have completed at least 24 elective credits in the major, and wish to pursue interest in one writer, a group of writers, a literary subject, theme, or period in a more intensive way. Offerings change each term, and students should consult the Department's course offerings booklet each semester to determine which seminars will be given.

Credits: 3. Contact Hours: 4 hr./wk.

ENGR - Engineering Course Descriptions

ENGR 10100 - Engineering Design

An introduction to the major engineering disciplines and contemporary issues impacting engineering. One hour per week will be devoted to

lectures related to the above issues by prominent faculty and outside speakers. Two laboratory hours per week will provide an introduction to engineering practice through hands-on investigations, computer applications, design projects and student presentations. The laboratory experience will consist of a single 14-week module or a combination of a 10-week module and a 4-week module in various engineering disciplines. Currently developed modules include a 14-week module in design and construction of an electrical device, four 10-week modules in structural design, robotic control, electronics and software development and two 4-week modules in software development and nanotechnology. All investigations and design projects are performed in groups and presented in oral and/or written form.

Credits: 1. Contact Hours: 1 lec. hr/wk., 2 lab hrs/wk. Prerequisite: Or coreq.: MATH 19500 (min. C grade). Open only to transfer students who have not completed MATH 20200.

FIQWS 10026 satisfies any requirement for ENGR 10100, as well as for ENGL 11000.

ENGR 10300 - Computer-Aided Analysis Tools for Engineers

An introduction to computer aided analysis techniques necessary for the study of electrical engineering and the design of electrical systems. Concepts introduced through short lectures are examined thoroughly during computer workstation-based workshops. Among the topics studied are: functions of real variables and their graphs, complex numbers and phasors, linear algebra, difference equations with applications to signal processing, and an introduction to system analysis.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: MATH 20100 (min. C grade).

ENGR 10610 - Introduction to Earth System Science and Engineering

The goal of this introductory course is to obtain an understanding of the entire Earth system on a global scale by studying its component parts (Atmosphere, Hydrosphere, Geosphere, and Biosphere); the interactions, linkages and dynamic equilibrium among these components on various time scales; and external forces on the system. This formulation is then applied to understanding the impact and interaction of anthropogenic factors, including modern engineering systems, on the environment (complex non-engineered systems). Examples will include topics such as global warming and sea level rise, etc. Select Laboratory Exercises: Minerals and Rocks, Simple Systems Computer Models, Mapping, Remote Sensing Data Handling and Visualization (IDL/ENVI).

Credits: 4. Contact Hours: 3 hr./wk. lecture, 3 hr./wk. lab.

ENGR 20400 - Electrical Circuits

Basic circuit laws. Methods of circuit analysis. Circuit theorems. Operational amplifiers. Capacitors and inductors. Sinusoids and phasors. Sinusoidal steady state analysis. Frequency response.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Or coreq.: PHYS 20800 (min. C grade); pre- or coreq.: MATH 20300 (min. C grade).

ENGR 20800 - Computation Methods for ESE

This course introduces Environmental Engineering students to the basics of computation methods in addressing issues of environmental interest. To address the unique needs of the Environmental Engineering, a major focus is placed on statistical methods, including both spatial and temporal analysis, graphics and mapping techniques, model estimation using Least Squares Optimization and the analysis of both satellite and model forecast data.

Credits: 2. Contact Hours: 3 hr./wk Prerequisite: MATH 20100, MATH 20200 (C or better). Corequisite: MATH 20300.

ENGR 23000 - Thermodynamics

Introductory concepts and definitions. Zeroth Law and absolute temperature. Work and Heat. First Law and applications. Second Law, Carnot theorems, entropy, thermodynamic state variables and functions

and reversibility. Power and refrigeration cycles, ideal gas mixtures, gas-vapor mixtures and the psychrometric chart. Introduction to statistical thermodynamics.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 10301 (min. C grade). Pre- or coreq.: PHYS 20800 (min. C grade), MATH 20300 (min. C grade).

ENGR 27600 - Engineering Economics

History of economic thought from the engineering point of view of modeling and control: Adam Smith to Keynes to Krugman and Thurow. Nature of the corporation. Balance sheet analysis. Time value of money: simple and compounded interest, annuities and loans, cash flow, profitability analysis and DCF rate of return. Cost estimation, cost benefit analysis. Risk analysis: forecasting, cash flow, simple probability theory, decision trees.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MATH 20100. (min. C grade).

ENGR 30000 - Social, Economic and Cultural Impact of Biomedical Technology

This course emphasizes community health care concerns in an urban environment. It has two central themes: (a) assessment of biomedical technology in the context of urban health needs, and (b) social and cultural impact of biomedical technology.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 21007 and BIO 32100. Offered: Fall Only.

ENGR 30100 - Introduction to Satellite Remote Sensing and Imaging

This introductory remote sensing course covers different environments where remote sensing can be applied, including discussion about a variety of space platforms and selected sensors that orbit the Earth. Emphasis is placed on the application of remote sensing on the interactions between the hydrosphere, biosphere, geosphere and atmosphere as well as bioproductivity and geophysical/geochemical processes in the oceans.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 20800 and ENGR 10300.

ENGR 41230 - The Management of Hazardous Wastes

The course introduces the regulatory framework and science fundamentals for the management of hazardous wastes. It focuses on the cleanup of sites contaminated with hazardous waste materials and discusses methodologies and processes used for their treatment and disposal. It covers the investigation of the extent of contamination at a site; characterization of fate and transport of contaminants; human health risk assessment; and defining cleanup goals. It utilizes case studies from recent and current projects to illustrate the engineering approaches, the selection, the design parameters and application of technologies being used to address different contaminants. Principles of science and engineering are applied in an interdisciplinary manner.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: CHEM 10301

ENGR 55400 - Reactor Physics and Engineering

The basic principles used in the design and operation of nuclear reactors are covered including the structure of the nucleus, nuclear stability and radioactive decay, fission and fusion reactions, interaction of radiation with matter, neutron diffusion and moderation, nuclear reactor theory, critical reactor and criticality calculation, nuclear fuels and reactivity control. Students will learn how to calculate the amount of energy released or absorbed in different nuclear reactions, radioactive decay rates, shielding against gamma rays and other radiation, neutron scattering and slowing down, neutron flux profiles in non-multiplying medium and fuel-moderator mixtures, critical fuel mass, poison build-up and their effects on reactivity. Light Water Reactors are of primary interest, but fast reactors and other reactor types will also be briefly studied.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 20800 and MATH 39100.

ENGR 55500 - Thermal Hydraulics

The principles of fluid mechanics and heat transfer used in the design and operation of nuclear reactors are covered including the heat generation by fission reactions, heat conduction in fuel elements, single-phase fluid mechanics/pressure drop in flow channels and fuel rod bundles, single-phase heat transfer, two-phase flow, and boiling and condensation heat transfer. Light Water Reactors are of primary interest, however, heat transport loops of other reactor types are also examined.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 35600 or CHE 34100; pre-/coreq.: ME 43300 or CHE 34200.

ENGR 55600 - Nuclear Reactor Design, Operation and Safety

This course teaches the basic principles in design, operation and safety of nuclear reactors. Basic principles of Reactor Physics and Thermal-Hydraulics will be first reviewed followed by a description of different reactor types, design of reactor thermal and control systems, normal and transient operations, reactor safety and licensing. The course includes nuclear reactor safety analysis using a reactor simulation code, PCTRAN.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGR 23000 or CHE 22900.

ENGR 55680 - Special Topics in Remote Sensing

The course will provide an advanced and thorough presentation of a few topically relevant remote sensing techniques/ applications beyond ENGR 30100 (Satellite Remote Sensing and Imaging). The topics will be chosen based on a combination of faculty and student interest in the areas of atmosphere, ocean and land remote sensing. The course will conclude with a semester ending team oriented project based intensively on analysis and interpretation of remote sensing data.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGR 30100

ENGR 59803 - Industrial Ecology

Credits: 3. Contact Hours: 3 hours

ENGR 59869 - ESE Design I

This is a two semester design sequence for Earth System Science and Environmental Engineering Students. The student is required to design and implement a solution that addresses a specific Earth system/environmental engineering problem or question. The weekly lectures expose students to principals of engineering design, including identification of a problem, background research, social environmental, ethical and economic considerations, intellectual property and patents and proposal writing including methods of engineering analysis and modeling. A detailed design proposal is completed during the first semester.

Credits: 2. Contact Hours: 1.5 hr. lecture/wk., 1.5 hr. supervised team meeting/wk. Prerequisite: EAS 21700 and the students must pass three out of five courses: ENGR 30100, ENGR 59910, CE 36500, CE 37200, CE 47400.

ENGR 59870 - Environmental and Earth System Science and Engineering Design II

The second semester is devoted to intensive design implementation. For the second semester, students are required to write an in depth engineering final report. They must also make an oral final presentation and demonstration to the faculty.

Credits: 3. Contact Hours: 3 hr. supervised design implementation workshop, 1.5 hr. design team meeting

ENGR 59910 - Introduction to GIS

Develop an understanding of geographic space and how maps represent geographic space. A student must be able to read maps, as well as write about and discuss information gleaned from maps. ArcGIS 9 will be

used as GIS tool for this course. By completing this course, students will: understand the basic concepts of geography necessary to efficiently use GIS technology, gain a basic, practical understanding of GIS concepts, techniques and real world applications, understand basic GIS analysis concepts and practical applications of GIS, and gain practical experience using basic GIS tools to build useful maps.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: CE 26400.

ENGR 59920 - Bldg Mod&Simul

Bldg Mod&Simul

Credits: 3. Contact Hours: 3 hr./wk.

ENGR 59950 - Special Topics in Earth System and Environmental Engineering

The lecture course will be taught by a team of faculty and topics covered will focus on ongoing research activities of the instructors including Water Resources, Sustainable/ Renewable Energy, Remote Sensing Technologies for Environment and Climate Applications etc.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGR 30100, CE 36500 (or permission of the instructor).

ESL - English as a Second Language Course Descriptions

ESL 12000 - Intermediate American English for Non-Native Speakers

An intensive writing course that focuses on clarity of ideas with heavy emphasis on academic writing and reading as related to the liberal arts elective course(s) being taken.

Credits: 0. Contact Hours: 3 hr./wk.

ESL 12100 - Reading for Non-Native Speakers

Instruction in reading and vocabulary development necessary to pass the liberal arts course(s) being taken.

Credits: 0. Contact Hours: 3 hr./wk.

Students take ESL 12000 and ESL 12100 along with required Core and/or elective Liberal Arts courses (e.g. Sociology, Art).

ESL 13000 - Advanced Composition for Non-Native Speakers

An intensive writing course that focuses on correctness in argumentative and persuasive writing. Reading materials are included to help develop expository skills in the Core and/or liberal arts elective courses being taken and to help students pass the CUNY/ACT. Special sections of ESL 13000 are offered for graduate and transfer students.

Credits: 2. Contact Hours: 4 hr./wk. Prerequisite: ESL 12000 or placement.

ESL 19901 - History, Society, and Culture

Advanced reading course for ESL students at the second level of the reading sequence. Designed to introduce concepts related to the Core and Liberal Arts elective course(s) in which students are registered and to help students pass the CUNY/ACT.

Credits: 2. Contact Hours: 4 hr./wk. Prerequisite: ESL 12100 or placement.

Students take ESL 13000 and/or ESL 19901 along with Core required and/or Liberal Arts elective courses (e.g., World Civilization, Anthropology, Computer Science, etc.).

FIQWS - Pathways Course Descriptions

FIQWS - Freshman Inquiry Writing Seminar

FIQWS is a six-credit course taught by two instructors that combines a specific topic and an intensive writing seminar. In any semester, an exciting variety of FIQWS sections are offered. In the topic component

of FIQWS, a student might explore a famous writer or artist, a particular school of philosophy, a scientific discovery or key historical event. In the writing component of FIQWS, an instructor will guide a student in writing essays and research papers concerning the subject of the seminar. Students who fail FIQWS should use ENGL 11000 to use the F policy on the writing portion of FIQWS.

3 credits of each 6 credit FIQWS are allocated to an area of the Flexible Core (topic section) and 3 credits are allocated toward the English Composition requirement (writing section). The Flexible Core variations are:

Credits: 6.

FIQWS 10003 - WCGI History & Culture

FIQWS is a six-credit course taught by two instructors that combines a specific topic and an intensive writing seminar. In any semester, an exciting variety of FIQWS sections are offered. In the topic component of FIQWS, a student might explore a famous writer or artist, a particular school of philosophy, a scientific discovery or key historical event. In the writing component of FIQWS, an instructor will guide a student in writing essays and research papers concerning the subject of the seminar. Students who fail FIQWS should use ENGL 11000 to use the F policy on the writing portion of FIQWS. 3 credits of each 6 credit FIQWS are allocated to an area of the Flexible Core (topic section) and 3 credits are allocated toward the English Composition requirement (writing section).

Credits: 6.

FIQWS 10005 - WCGI Literature

FIQWS is a six-credit course taught by two instructors that combines a specific topic and an intensive writing seminar. In any semester, an exciting variety of FIQWS sections are offered. In the topic component of FIQWS, a student might explore a famous writer or artist, a particular school of philosophy, a scientific discovery or key historical event. In the writing component of FIQWS, an instructor will guide a student in writing essays and research papers concerning the subject of the seminar. Students who fail FIQWS should use ENGL 11000 to use the F policy on the writing portion of FIQWS. 3 credits of each 6 credit FIQWS are allocated to an area of the Flexible Core (topic section) and 3 credits are allocated toward the English Composition requirement (writing section).

Credits: 6.

FIQWS 10008 - Individual and Society

FIQWS is a six-credit course taught by two instructors that combines a specific topic and an intensive writing seminar. In any semester, an exciting variety of FIQWS sections are offered. In the topic component of FIQWS, a student might explore a famous writer or artist, a particular school of philosophy, a scientific discovery or key historical event. In the writing component of FIQWS, an instructor will guide a student in writing essays and research papers concerning the subject of the seminar. Students who fail FIQWS should use ENGL 11000 to use the F policy on the writing portion of FIQWS. 3 credits of each 6 credit FIQWS are allocated to an area of the Flexible Core (topic section) and 3 credits are allocated toward the English Composition requirement (writing section).

Credits: 6.

FIQWS 10011 - Scientific World

FIQWS is a six-credit course taught by two instructors that combines a specific topic and an intensive writing seminar. In any semester, an exciting variety of FIQWS sections are offered. In the topic component of FIQWS, a student might explore a famous writer or artist, a particular school of philosophy, a scientific discovery or key historical event. In the writing component of FIQWS, an instructor will guide a student in writing essays and research papers concerning the subject of the seminar. Students who fail FIQWS should use ENGL 11000 to use the F policy on the writing portion of FIQWS. 3 credits of each 6 credit FIQWS are allocated to an area of the Flexible Core (topic section) and 3 credits

are allocated toward the English Composition requirement (writing section).

Credits: 6.

FIQWS 10013 - Creative Expression

FIQWS is a six-credit course taught by two instructors that combines a specific topic and an intensive writing seminar. In any semester, an exciting variety of FIQWS sections are offered. In the topic component of FIQWS, a student might explore a famous writer or artist, a particular school of philosophy, a scientific discovery or key historical event. In the writing component of FIQWS, an instructor will guide a student in writing essays and research papers concerning the subject of the seminar. Students who fail FIQWS should use ENGL 11000 to use the F policy on the writing portion of FIQWS. 3 credits of each 6 credit FIQWS are allocated to an area of the Flexible Core (topic section) and 3 credits are allocated toward the English Composition requirement (writing section).

Credits: 6.

FIQWS 10015 - US Experience

FIQWS is a six-credit course taught by two instructors that combines a specific topic and an intensive writing seminar. In any semester, an exciting variety of FIQWS sections are offered. In the topic component of FIQWS, a student might explore a famous writer or artist, a particular school of philosophy, a scientific discovery or key historical event. In the writing component of FIQWS, an instructor will guide a student in writing essays and research papers concerning the subject of the seminar. Students who fail FIQWS should use ENGL 11000 to use the F policy on the writing portion of FIQWS. 3 credits of each 6 credit FIQWS are allocated to an area of the Flexible Core (topic section) and 3 credits are allocated toward the English Composition requirement (writing section).

Credits: 6.

FIQWS 10045 - Philosophy

FIQWS is a six-credit course taught by two instructors that combines a specific topic and an intensive writing seminar. In any semester, an exciting variety of FIQWS sections are offered. In the topic component of FIQWS, a student might explore a famous writer or artist, a particular school of philosophy, a scientific discovery or key historical event. In the writing component of FIQWS, an instructor will guide a student in writing essays and research papers concerning the subject of the seminar. Students who fail FIQWS should use ENGL 11000 to use the F policy on the writing portion of FIQWS. 3 credits of each 6 credit FIQWS are allocated to an area of the Flexible Core (topic section) and 3 credits are allocated toward the English Composition requirement (writing section).

Credits: 6.

FIQWS 10103 - Composition for WCGI History & Culture

Students must also take corresponding section of FIQWS 10003. See your advisor for FIQWS schedule.

Credits: 3. Contact Hours: 3 hr.

FIQWS 10105 - Composition for WCGI Literature

Students must also take corresponding section of FIQWS 10005. See your advisor for FIQWS schedule.

Credits: 3. Contact Hours: 3 hr.

FIQWS 10108 - Composition of Individual & Society

Students must also take corresponding section of FIQWS 10008. See your advisor for FIQWS schedule.

Credits: 3. Contact Hours: 3 hr.

FIQWS 10111 - Composition for Scientific World

Students must also take corresponding section of FIQWS 10011. See your advisor for FIQWS schedule.

Credits: 3. Contact Hours: 3 hr.

FIQWS 10113 - Composition for Creative Expression

Students must also take corresponding section of FIQWS 10013. See your advisor for FIQWS schedule.

Credits: 3. Contact Hours: 3 hr.

FIQWS 10115 - Composition for US Experience

Students must also take corresponding section of FIQWS 10015. See your advisor for FIQWS schedule.

Credits: 3. Contact Hours: 3 hr.

FIQWS 10145 - Composition for Philosophy

Students must also take corresponding section of FIQWS 10045. See your advisor for FIQWS schedule.

Credits: 3. Contact Hours: 3 hr.

FQUAN - Pathways Course Descriptions

FQUAN - Freshman Quantitative Analysis

3 credit course that fulfills the basic quantitative requirement for CLAS students, but is usually taught in a department other than Math. It can examine the data and trends surrounding a specific issue, or look at quantitative applications in other fields such as a science, psychology, sociology, etc. FQUANS may be offered as smaller thematic courses or as large lectures that break down into recitation sections.

Credits: 3.

FQUAN 10050 - Freshman Quantitative Analysis

Credits: 3. Contact Hours: 3 hours

FREN - French Course Descriptions

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which are numbered 123, 124 and 226.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

FREN 12400 - Introductory French II

A continuation of FREN 12300 using a communicative approach to develop conversational skills and provide students with further study of French grammar and vocabulary.

Credits: 4. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: FREN 12300 or placement.

FREN 22600 - Intermediate French

A one-semester French course at the intermediate level. This course will review the grammar of the French Language, enhance vocabulary, and will include literary and cultural readings. It will further develop listening, speaking, reading comprehension, and writing skills through class discussions and the use of multimedia and the Internet.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: FREN 12400, or placement examination.

FREN 28300 - The Literature of Contemporary France

Critical analysis of representative works, writers and movements. Proust, Gide, Camus, Sartre, Malraux, Duras, Robbe-Grillet and others.

Credits: 3. Contact Hours: 3 hr./wk.

FREN 30000 - Focus on French Grammar

Rotating, semester-long topics that provide review of French grammar in context. This course will use both grammar workbooks and short literary or cinematic texts to reinforce basic and more advanced grammatical structures needed for expression in French. Specific course content will vary by semester and will be announced beforehand. May be taken up to two times for credit.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination.

FREN 30103-30300 - Honors I-III

Credits: Variable cr. 1-4.

FREN 30400 - Focus on Written Expression

Rotating, semester-long topics that provide practice in basic writing skills in French. Practice in the styles and forms of expository and analytical writing including personal narratives, explication de texte, and argumentative essays. Accompanying texts will provide critical models and subjects on which students will base informal and formal written assignments of varying lengths. Specific course content will vary by semester and will be announced beforehand. Can be taken up to 2 times for credit.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination

FREN 30500 - Focus on Oral Expression

Rotating, semester-long topics that provide practice in basic speaking skills in French. Intensive practice of the spoken language. Work on aural comprehension, oral production, correct pronunciation and idiomatic speech. Discussion of short stories, films or current events dealing with France and the Francophone world. Specific course content will vary by semester and will be announced beforehand. Can be taken up to 2 times for credit.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination.

FREN 30600 - Focus on Reading

Rotating, semester-long topics that provide an introduction to close reading and literary analysis in French. The course offers an overview of short French and Francophone texts across various periods and genres and is meant to prepare students for literary analysis at a higher level. Specific course content will vary by semester and will be announced beforehand. Can be taken up to 2 times for credit.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination.

FREN 31000 - Independent Study

Credits: Variable cr. 1-4.

FREN 31001 - Independent Study

Credits: 1. Contact Hours: 1 hour

FREN 31002 - Independent Study

Credits: 2. Contact Hours: 2 hours

FREN 31003 - Independent Study

Credits: 3. Contact Hours: 3 hours

FREN 31100-32000 - Selected Topics

A series of advanced courses to be offered with varying frequency on selected topics not generally covered in the set course offerings.

Credits: variable cr., 1-3. Contact Hours: Variable, 1-3 hr./wk. Prerequisite: FREN 32100 and FREN 32200.

FREN 33300 - French Cinema And Literature

Credits: 3. Contact Hours: 3 hours

FREN 40100 - France in the World: Monarchy and Revolution

Through poetry, theater, novels and essays students will explore literature and culture in France up through the Revolutionary period.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination.

FREN 40200 - France in the World: The Modern Age

Through poetry, theater, novels and essays students will explore literature and culture in France and the Francophone world following the Revolutionary period and into the twentieth century.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination.

FREN 40300 - France in the World: Contemporary Experiences

Through poetry, theater, novels and essays students will explore literature and culture in France and the Francophone world from the mid-twentieth century and contemporary period.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination.

FREN 40400 - France in the World: Empire, Colonies, Post-colonialism

Through poetry, theater, novels and essays students will explore literature and culture emerging from colonial encounters and postcolonial experiences across Asia, Africa, the Americas and the Caribbean.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination.

FREN 40500 - French and Francophone Cinema

An introduction to works of French and Francophone filmmakers with an emphasis on developing a critical approach to cinema as a specific art form with its own discourses and methodologies.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination.

FREN 40600 - Theories and Histories of Literature

An introduction to French and Francophone theories of literature, culture, and translation from the modern and contemporary periods. This course is mostly aimed at students preparing for graduate study in literature. It will engage students in discussions about the historical, philosophical, political and sociological approaches to literary study.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: FREN 22600 or placement by examination.

FREN 49900 - Experiential and Service Learning

An experiential or service learning opportunity that provides students with the chance to use the skills and knowledge they have acquired in understanding, speaking, reading, and writing in the target language in a real-world context. Experiential learning internships allow students to develop career and academic goals by training in private and public sector jobs that depend on linguistic and cultural fluency in languages other than English. Service learning opportunities are focused on enabling students to use language skills in order to positively impact individuals and organizations in the wider community. Credit is subject to approval by the Director of Experiential and Service Learning in CMLL.

Credits: Variable 1-3. Contact Hours: Variable Prerequisite: A total G.P.A. of 2.5 or above; completion of a minimum of 15 credits toward the major with a G.P.A. in the major of at least 2.5.

GERM - German Course Descriptions

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or

concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which are numbered 123, 124 and 226.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

GERM 12300 - Introductory German I

An introductory course using a communicative approach to develop conversational skills and provide the student with a foundation in German grammar, pronunciation and vocabulary.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

GERM 12400 - Introductory German II

A continuation of GERM 12300 using a communicative approach to develop conversational skills and provide students with further study of German grammar and vocabulary.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: GERM 12300 or placement.

GERM 22600 - Intermediate German

A one-semester German course at the intermediate level. This course will review the grammar of the German Language, enhance vocabulary, and will include literary and cultural readings. It will further develop listening, speaking, reading comprehension, and writing skills through class discussions and the use of multimedia and the Internet.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: GERM 12400 or placement.

HEB - Hebrew Course Descriptions

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which are numbered 123, 124 and 226.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

HEB 12100 - Elementary 1

Emphasis on rapid progress in conversational and written Hebrew in the modern idiom. Basic speech patterns, grammar, syntax and vocabulary through drill and conversation.

Credits: 3. Contact Hours: 4 hours

HEB 12200 - Elem 2nd Year

Emphasis on rapid progress in conversational and written Hebrew in the modern idiom. Basic speech patterns, grammar, syntax and vocabulary through drill and conversation.

Credits: 3. Contact Hours: 4 hours

HEB 12300 - Introductory Hebrew I

An introductory course emphasizing conversational and written Hebrew in the modern idiom. Basic speech patterns, grammar, syntax and vocabulary through drill and conversation and language in class and at the Language Media Center.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

HEB 12400 - Introductory Hebrew II

A continuation of HEB 12300 emphasizing conversational and written Hebrew in the modern idiom. Basic speech patterns, grammar, syntax and vocabulary through drill, conversation in class and at the Language Media Center.

Credits: 3. Contact Hours: 4hr./wk. plus 1 hr. at the Language Media Center Prerequisite: HEB 12300 or placement.

HEB 22600 - Intermediate Hebrew

A one-semester Hebrew course at the intermediate level. This course will review Hebrew grammar, enhance vocabulary, and will include readings in classical as well as contemporary Hebrew literature. Further goals of this course will be to develop speaking and writing skills through classroom activities as well as through multimedia and Internet.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: HEB 12400 or placement examination.

HEB 30100-30300 - Honors I-III

Approval of Dean and Departmental Honors Supervisor required. Apply in NA 5/225 no later than December 10 in the Fall term or May 1 in the Spring term.

Credits: Variable cr..

HEB 31000 - Independent Study

Approval of Department required before registration.

Credits: 1-4.

HEB 31100-33900 - Selected Topics

Including: The Bible and Archaeology; Bible, Law and Society; The Bible in Light of Ancient Near Eastern Texts; The Dead Sea Scrolls; Messianism; Biblical Themes in Art and Literature; The Bible and Its Commentaries; Comparative Religions; Jewish Law and Lore; Biblical and Classical Foundations of Modern Legal and Bio-ethical Issues. For other offerings, please consult the Department.

Credits: variable cr., 1-3.. Contact Hours: Variable 1-3 hr./wk.

HIST - History Course Descriptions

200-level courses provide broad, introductory surveys suitable for first and second year students. Co-requisite: FIQWS

300-level courses provide more intensive examinations of regional and topical themes. Pre-requisites: sophomore standing, one 200-level course in history, or instructor's permission.

400-level courses provide intensive courses designed primarily for majors. Pre-requisite: junior standing, one 300-level course in history, or instructor's permission.

HIST 12404 - American Civilization I

American Civilization I

Credits: 4. Contact Hours: 4

HIST 20100 - The Ancient World: The Near East and Greece

Examines the rise and fall of civilizations in the ancient Near East and the Greek world to the Hellenistic Age.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS

HIST 20200 - The Ancient World: Rome

Surveys the history of classical antiquity from the Hellenistic Age to the fall of the Western Empire.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 20400 - Early-Modern Europe

An overview of European history from the resurgence of urban life and classical culture during the Renaissance to the trials and tribulations of the French Revolution.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 20600 - Modern Europe

An overview of social, economic, political, and intellectual developments in Europe from the Enlightenment to the present, and an

introduction to the study of history. Topics include the problem of revolution, industrialization and the transformation of rural societies, the emergence of liberalism and the challenges it has faced in the twentieth century.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 20601 - Modern Europe (Honors)

An overview of social, economic, political, and intellectual developments in Europe from the Enlightenment to the present and an introduction to the study of History. Topics include the problem of revolution, industrialization and the transformation of rural societies, the emergence of liberalism and the challenges it has faced in the 20th century.

Credits: 3. Contact Hours: 3 hr./wk.

HIST 21001-21999 - Special Topics in History

These special topics courses offer experimental and thematic courses on a rotating basis, providing broad, introductory surveys suitable for first and second year students.

Credits: 3. Contact Hours: 3 hr./wk.

HIST 21002 - US And The World

This course surveys the history of U.S. foreign relations since 1890, with special attention to the rise of the U.S. as a superpower. Topics include ideology and U.S. foreign policy, human rights, grand strategy, imperialism, American political culture, globalization, American unilateralism, and the War on Terror.

Credits: 3. Contact Hours: 3 hr./wk.

HIST 21003 - Africa before 1500

Course will examine such early civilizations as the Axum, Nubia, Jenne-jeno, Ile-Ife, central African rain forest societies, Swahili towns, and Great Zimbabwe. Close attention will be paid to how mobility, technological innovation, environmental management, and cross-cultural interaction have shaped African history.

Credits: 3. Contact Hours: 3 hr./wk.

HIST 21300 - The Historian's Craft

Designed to introduce history as an academic discipline. It offers students an intensive introduction to research skills and the principles and methods of historical analysis. Helps students enhance their critical reading and writing skills while increasing their understanding of the nature of historical inquiry.

Credits: 3. Contact Hours: 3

23700 - Asia and the World

The major factors that have shaped the Asian countries and peoples; geography, civilization, migration, and settlements of ethnic groups; philosophies, religions, historical events, leaders, and modern political and socioeconomic institutions.

Credits: 3. Contact Hours: 3 hr./wk.

23800 - The Middle East in Global History

Introduction to Middle East history and politics in global perspective. Emphasis on historical connections to world regions such as South Asia, North Africa, Europe, and the Americas. Topics of study include legal cultures; migration; imperialism; diplomacy; political economy; and the impact of technological, political, and cultural revolutions on Middle Eastern peoples and diasporas across time.

Credits: 3.

HIST 24000 - The United States: From Its Origins to 1877

The major theological and social conflicts of 17th century English colonies; the political and ideological process that defined an American identity; the social and economic forces that shaped the early Republic; the nature and the regional conflicts that culminated in civil war.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 24100 - The United States: Since 1865

Examines the social conflicts that accompanied the transformation of the U.S. from an agrarian republic and slave society to one of the most powerful industrial nations in the world. Particular attention will be paid to the building of new social and economic institutions and to cultural and visual representations of the nation and its people.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 24201 - Modern History of Latin America

A broad historical introduction to Latin American and Caribbean development in the context of global history, focusing on colonialism, the Atlantic slave and sugar economies, revolution, nationalism, race and racism, topics economics modernization, migration/emigration, and social movements. The approach will be chronological and thematic, with particular attention to influence of Latin American and Caribbean development beyond the borders of the continent.

Credits: 3. Contact Hours: 3 hr./wk.

HIST 25100 - Traditional China

The early formation of the Chinese state, the intellectual foundation that has sustained its long history, the shaping of the Confucian way of life, and the cultural sophistication and its decline on the eve of the modern world.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 25300 - Modern China

Change and continuity in the Chinese tradition across the 19th and 20th centuries. The encounter with the West, social and political disruptions, efforts to industrialize, and especially the evolution and outcome of the Chinese revolution will be stressed.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 25400 - Traditional Japan

Japanese history from its origins to the nineteenth century, i.e., the "classic" Heian period, "medieval" Kamakura to Sengoku periods and the "early modern" Tokugawa world. Topics: Japan's contacts and borrowings from other civilizations, especially China; Shinto and Buddhism; women and the family; the rise and transformation of bushi or warriors; artistic traditions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 25500 - Modern Japan

Survey of the building of the modern Japanese state, society and economy from 1868 to the present, with focus on continuity and change, the social costs of rapid industrialization and the emergence of Japan in the global economy.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 26200 - The Middle East Under Islam

The rise of Islam and Arab conquests of the Middle East and North Africa through the Crusades and Mongol invasion. Covering the period 600 to 1500, we will focus on politics, culture, and society.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 26300 - Traditional Civilization of India

The history and culture of Indian civilization before modern times; major emphasis will be on its formation and classical age, its continuity and change, and the coming of Islam.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 26400 - Modern India

Surveys the elements which have shaped the characteristic institutions of India; the disintegration of the Mogul empire and the rise of the British to dominance; political, economic, cultural, and social

developments during the British period and the changes wrought by the republic.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 27600 - Africa and the Modern World

A social history of Africa from the 19th century to the present, with emphasis on state formation, impact of the slave trade, and resistance to colonialism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 27700 - Africa Since Independence

Examines the diverse and complex history of sub-Saharan Africa, from the 1960s to the present. Themes will include the rise of the post-colonial state, legacies of colonialism, ideologies of development, globalization, as well as questions relating to ethnicity, race, class, and culture.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 28000 - Latin America in World History

A historical introduction to the cultures and societies of Latin America and the Caribbean from the Pre-Colombian era to the present and their place in world history.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 28100 - Colonial Latin America

A study of the impact and meaning of colonial rule in Latin America and the Caribbean, focusing on the interaction between European goals and institutions, and indigenous American and African strategies of socio-cultural survival.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 28200 - Modern and Contemporary Latin America

Contemporary economic, social and political problems of Latin America and the Caribbean studied in historical perspective. Themes include foreign economic and political intervention; labor systems and patterns of land ownership; class, ethnic, and racial relations; the politics of reform, revolution and authoritarianism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 30100-30300 - Honors I-III

A program of individual reading and research under the guidance of faculty members specializing in various areas of historical study. Ordinarily the three-term sequence culminates in the writing of an honors thesis. The Departmental Honors Committee also conducts informal colloquia on problems of historical method and criticism, and on important books on history. Approval of Dean and the Departmental Honors Committee is required. Apply no later than December 10 in the Fall term and May 1 in the Spring term.

Credits: Credit flexible. Contact Hours: Credit flexible but usually 3 cr./sem.

HIST 31000 - Independent Study in History

Designed to meet the needs of students for work not covered in regular offerings. The student will pursue a reading program, with periodic conferences, under the direction of a member of the Department, and with the approval of the Department Chair; limited to juniors and seniors with an adequate background for the work to be pursued.

Credits: Credit flexible. Contact Hours: Credit flexible, but will not exceed 4 credits. Credit will be determined by the instructor with the approval of the Chair.

HIST 31100-32000 - Selected Topics in History

Special study in topics not covered in the usual department offerings, more intensive examinations of regional and topical themes. Topics vary from semester to semester, depending upon student and instructor interest.

Credits: 3. Contact Hours: Usually 3 hr./wk.

HIST 32034 - The Nazi Holocaust

How do we begin to understand the mass destruction of civilians, and especially Jews, by the Nazis during World War II, commonly known as the Holocaust? This course will examine some of the conditions that led to this extraordinary process of transforming whole peoples into the "other" and as potential objects for extermination. Students will look especially at how the race hatred of anti-Semitism became state policy under the Nazis, and what economic, social and political conditions encouraged its rise. The course will as look at examples of resistance to the Holocaust. Guest lectures will be included as part of the Patai Program's Lecture Series.

Credits: 4. Contact Hours: 4hr/wk

HIST 32100 - Early America: From Settlement to the Great Awakening

This course examines the formation of early American society on the Atlantic seaboard. Particular attention is given to the establishment of four distinct regional socio-political cultures in New England, the Middle Colonies, the Chesapeake, and the Deep South. Other topics include the impact of European settlement and trade on Amerindian life and culture, the emergence and rise of slavery, and the role of women and the family in early American society.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 32200 - The Era of the American Revolution

This course details the causes, events, and consequences of one of the first and most important revolutionary movements of the Enlightenment, down to the creation and ratifications of the United States Constitution. Particular attention is devoted to the social and political causes of the uprising, as well as its cultural meaning for the different participants in the American scene.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 32300 - The New Nation, Slave and Free

Republicanism and the democratization of politics, industrialization of an American working class, social reform and the making of the middle class, westward expansion and the removal of the Native Americans, sectional conflict and slave culture.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 32304 - The New Nation, Slave and Free

North and South; Puritans and Witchcraft; Plantations and Slavery. In this course students will examine two radically different experiments in creating a new society in the early years of our nation. The economic and social systems, membership, and successes and failures, of two of the first permanent settlements - the Jamestown Virginia Plantation and the Massachusetts Bay Colony - will be starting points to examine how such radically different societies came together to fight a revolutionary war for independence. These issues will be framed in terms of the legacies, tragedies, compromises, and conflicts that followed and set the tone for our many of our current systems and laws.

Credits: 4. Contact Hours: 4hr/wk

HIST 32400 - The Era of Civil War and Reconstruction, 1840-1877

The causes and consequences of the American Civil War, focusing on the reasons for sectional conflict, emancipation, the role of Abraham Lincoln, the conflict over Reconstruction and the new status of emancipated slaves.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 32500 - The Age of the Renaissance

An in-depth exploration of the culture of the Italian Renaissance. Through primary sources, this course reconstructs experiences of: citizenship in the Italian city-states; the enterprises and vagaries of the business world; matrimony, paternity/maternity and sexuality; elementary education and University study; art patronage and visual culture; the entertainments and decorum of life at Court as well as expressions of religiosity.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 32501 - The Gilded Age and Progressive Era, 1877-1920

The political, economic, and social phases of the development of the United States from Reconstruction to WWI. Populism and Progressivism; the industrialization of society and emergence of the labor movement.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 32600 - The U.S. from 1914-1945

America and WWI, the Roaring Twenties, the Depression, and the New Deal, Roosevelt's leadership, WWII, and the beginnings of the Cold War.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 32700 - The U.S. Since 1945

The course will analyze the main political, social, and economic events shaping the United States during this period and try to explain the key political/economic change during these years: The transformation of a country employing an activist Keynesian economic policy and belief in government action to rectify social and economic ills to one espousing market or neo-liberal principles.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 32850 - The French Revolution

A thorough introduction to the French Revolution - one of the defining events of modern times, and the crucible in which key elements of modern politics were forged or redefined: universal manhood suffrage, human rights, civil equality, direct democracy, ideological dictatorship, nationalism, women's liberation, and revolution itself.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 32950 - History of the Soviet Union

Survey of 20th century Russian history, with an emphasis on the Soviet polity from its establishment in October 1917 to its collapse in 1991. Includes Russian Revolution, socialist state-building, collectivization and industrialization, Great Terror, and decline of the Soviet empire.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 33350 - Twentieth-Century China

This course will examine China's revolutionary changes in the last century. In particular, it will focus on major events from the Boxer uprising and the 1911 Revolution to the Cultural Revolution, the evolution of Sino-U.S. relations, and the post-Mao economic reforms and related social and political changes.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 33450 - China's "Cultural Revolution," 1966-1976

This course will help students to understand the origin, development, and consequences of the movement through the examination of key events, careers of major political players, and the life of average

participants of the Cultural Revolution. It will also consider the source, difficulties, and prospects of the ongoing reforms in China.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 33550 - Japanese Society since WWII

This course will look at changing dynamics of Japanese society since 1945, with some emphasis on Japan today in contrast to the United States. Topics include: dynamics of family and work life, popular culture, education, women's roles, major political and ethnic/regional issues, challenges of globalization, urban cultures, Japan's issues with terrorism, and Japan's status in Asia.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 33800 - Islamic Political Movements

This course will introduce students to the history of the Middle East, including the region from North Africa to Afghanistan, in the nineteenth and twentieth centuries. Central themes include: modernizing attempts by the Ottoman and Qajar Empires in the face of European encroachment; transition from empire to nation-state; the role of religion in politics; Arab nationalism; and the role of tribes and oil in state formation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 34200 - The History of Medicine

Geographical and chronological focus will vary. Themes will include: religious and secular efforts to define "disease"; the importance of gender for medical theory and practice; the relationship between patient rights and the common interest; the development of public health programs; and milestones in the history of biology and medicine.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 34450 - The Modern Middle East

This course will introduce students to the history of the Middle East, including the region from North Africa to Afghanistan, in the nineteenth and twentieth centuries. Central themes include: modernizing attempts by the Ottoman and Qajar Empires in the face of European encroachment; transition from empire to nation-state; the role of religion in politics; Arab nationalism; and the role of tribes and oil in state formation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 35000 - The Scientific Revolution

Especial emphasis will be placed upon the institutions, sociability and material culture of science in the early modern period and their importance for the development of modern scientific theory. Topics will include: Renaissance natural philosophy; from natural to mechanical philosophy; the telescope and the new world view of Galileo; the culture of observation, the embrace of empiricism, and the invention of experimentation; the print culture of science and the dissemination of new scientific ideas.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 35100 - The Age of Enlightenment

An in-depth exploration of the protean culture and new knowledges of eighteenth-century Europe. Through primary sources and select historiography, this course reconstructs: the rising literacy rate and proliferation of print culture; the culture of literary and art salons; the appeal of the exotic and the idea of the noble savage; meditations on happiness and pleasure; the problem of luxury and the discovery of the market as well as the new sciences of the mind, of language and of progress.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 35101 - Science, Technology, and Modernity

Explores the relation between science, technology and modern society from the industrial revolution to the rise of fascism, paying particular attention to the life sciences.

Credits: 3. Contact Hours: 3hr. / 3cr. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 35200 - Intellectual History of Modern Europe

Examines European thought from the Enlightenment and its ideological offspring - 19th C. liberalism and socialism - to the critique of the Enlightenment, beginning with Nietzsche and culminating in late 20th C. post-structuralism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 35201 - Science and Technology in the 20th Century

This course covers the history of major developments in science and technology during the 20th C. It presents the making of these scientific and technological achievements and the lives of some of the greatest scientists and inventors as well as their social, economic, and cultural influence.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 35700 - History of Socialism

The growth of the socialist movement in the nineteenth and twentieth centuries and its main ideological expressions: utopian, Marxist, revisionist, syndicalist. The relations between ideology and concrete historical circumstances; trade unionism; revolution; working class growth and change; Bolshevism; national liberation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 36100 - The Writing of American History

The aim of this course is to study selected writings of major American historians who have thought perceptively and written eloquently about the past. Readings will stress ideas that have challenged, and continue to challenge, thinking people.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 36300 - African-American History to Emancipation

A survey of African American experience including their origins in Africa, the slave trade, colonial and plantation slavery, slave culture, resistance, the Civil War and Emancipation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS.

HIST 36500 - African-American History from Emancipation to the Present

The post-slavery experience of African-Americans: the creation and destruction of a black peasantry, the growth of a black working class, and the resulting change in black politics and culture.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 36600 - U. S. Women's Movement

This course traces the linkage between women's roles in U.S. society and their activism to achieve women's rights.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 37000 - American Legal History

Examines key legal and constitutional conflicts in the 19th and 20th century U.S. in order to understand the role of law and the social and cultural meaning of law in American history. Topics include slave law; property law and economic change; the law of husband and wife; race and the Constitution; and legal ethics, among others.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 37500 - U.S. South

Explores the historical characteristics of the South and relates the experience of the region to that of the U.S. as a nation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 37600 - Women of the African Diaspora

This course will provide a historical background to the various contemporary situations and problems peculiar to women of the African diaspora. It will study marriage, family, religious practices, politics, business, and work.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 37800 - American Liberalism

A survey of liberalism in the U.S. drawing on both primary sources and historians' accounts, this course provides a thorough, contextualized understanding of this country's central political ideology.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 37900 - The Collapse of Communism and Post-Soviet Europe

Examines the history of the Soviet Union and Eastern Europe from the late 1960s to the present. Topics include the long- and short-term causes of the collapse of Communism, the economic, political, social, and cultural legacies of Communism, and the challenges confronting the post-Communist world.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Sophomore standing, one 200-level course in history, or instructor's permission.

HIST 41201 - Law & Society in Medieval and Early Modern Europe

An intensive survey of ideas about the nature and the natural rights of the individual and of the state in medieval and early modern Europe, placing an especial emphasis upon the legal writings of scholars such as Aquinas, Bartolus, Vitoria, Bodin, Grotius, Hobbes, Locke, Pufendorf, Vico, Montesquieu, Rousseau, Smith, and Kant.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 41600 - The Early-Modern European City

Urbanization in Europe from 1400 through 1800. In particular, it will reconstruct the spectacular emergence of the hallmark features of Europe's preeminent capital cities out of their most intense periods of crisis and transformation in the early modern period. Especial emphasis will be placed upon the new cosmopolitanism of Rome, London and Paris.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 42000 - The Modern European City

Examines cities such as London, Paris, Vienna, Prague, and Berlin as incubators of specific versions of the "modern." Themes covered will include urban planning and architecture; class and ethnic conflict, and the rise of mass politics; the emergence of women's movements, youth culture, and anti-Semitism; and the relationship between modernism and mass culture.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 42100 - Work and Welfare in Modern Europe

Examines the emergence of the industrial revolution and efforts to control it, to manage markets for capital and labor, since the eighteenth century.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 42300 - Psychiatry, Madness, and Society

Examines social, cultural, intellectual and institutional aspects of the history of madness in Europe since 1789. The course will begin with the age of the so-called "Great Confinement," then move on to consider the institutional and therapeutic reforms of the revolutionary and post-revolutionary era; the rise of theories of degeneration, hysteria and neurasthenia in the second half of the 19th century; psychoanalysis and sexology; war neurosis and military psychiatry; psychiatry under the Nazis. It will conclude by looking at the anti-psychiatry movement of the 1960s and the new biological psychiatry of the 1980s and 1990s.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 42400 - The Great War

A comprehensive overview of World War I. Central themes include the origins of the conflict, both long- and short-term; the nature of industrial killing; the growth of the state, of mass armies, of economic regulation; and the revolutionary movements that the prolonged war effort spawned.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 42500 - Age of Dictators

Examines the totalitarian regimes that emerged in Soviet Russia and Nazi Germany. Beginning with the impact of WWI on both societies and ending with WWII, it traces the rise of two regimes that despite their ideological opposition had many features in common: a single party system, the extensive use of propaganda and terror, an embrace of science and of cultural programming, the leadership cult surrounding Stalin and Hitler, and the camps system.

Credits: 3. Contact Hours: 3 hr./wk.

HIST 42900 - Minorities in Modern Europe

Beginning with the emancipation of Jews during the French Revolution and the emergence of modern, national citizenship, the course will examine the ways in which European states have managed ethno-religious minorities, with a special emphasis on the 20th C. Topics will include WWI and the break-up of multi-ethnic empire, forced population transfers, refugees, and genocide, as well as the growth of labor migration, welfare and guest-worker systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 43000 - France and Francophone Africa

Examines the relationships between France and countries of the former French overseas empire in Africa from the occupation of Algeria in 1830 to political independence, to issues of post-colonial dependency in Africa and the emergence of multicultural France today.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 43100 - The History of Sexuality

This course examines how varying sociopolitical contexts and cultural systems have shaped people's understandings and expressions of sexuality through history. Themes include: same-sex and transgendered sexualities; sexual implications of colonialism and racism; pornography; prostitution; rape; and reproductive sexualities.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 44000 - Labor, Technology, and the Changing Workplace

Technological change has a profound impact on both work and society. This course explores the meaning of these changes for workers, their unions and consumers. Questions related to resistance, progress and how new technologies are shaped are the main concerns of the course. Various issues and historical landmarks that pertain to the changing workplace; social and individual costs and benefits of technology; and work restructuring and how union respond to change will be examined.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 44100 - The History of American Labor

Focuses on the period since 1850. Discusses industrialization and the worker, immigration, the impact of social reformers and radicals. Considerable attention to the labor movement, which is viewed within the broader context of American society.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 44500 - European Land Empires

An introduction to Europe's great land empires: the Ottoman, Russian, and Habsburg. The course begins with an overview of each empire's historical formation, political structure, economy, and social character. It then turns to the 19th and early 20th centuries. Topics include: concepts of empire; concepts of modernization; the challenges of nationalism, revolution, and terrorism; definitions of citizenship and rights; and the long and short-term causes for each empire's collapse.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 44800 - American Urban History

Economic, social, and physical development to the present. Merchant, industrial, and corporate stages of urbanization and their distinctive architectural expressions. Slides and walking tours to examine urban forms and spatial arrangements. Major objective is analysis of physical consequences of market decisions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 44900 - Power, Race, and Culture: The History of New York City

This course will introduce students to the interdisciplinary study of American culture through an examination of New York City-its history, literature and culture. Students will examine the historical and cultural context of New York as a center of migration and immigration and power, as a cultural capital, and as an arena of racial, ethnic, and religious traditions and conflicts.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 45000 - History of American Foreign Relations

Traces the interrelationship between basic domestic forces and their manifestation in the objectives of United States foreign policy. Emphasis is on Puritanism, Messianism, the rise of corporate capitalism, and twentieth-century attempts to shape the American imperium.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 45100 - Comparative Slavery

Slavery, a relationship in which one man held property in another's person, existed in many societies, ancient and modern. By examining the role of slavery in various cultures over time, characteristics useful in understanding the development of New World slavery will be explored. The course will begin with slavery in ancient civilizations (e.g., Greece, Rome, Africa), and then examine the New World societies created after

1492. Finally, the sources and character of emancipation and abolition will be considered.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 45400 - Science and Technology in China

Credits: 3. Contact Hours: 3 hr./wk.

HIST 46400 - Science and Technology in China

A survey of the scientific and technological developments in China from ancient times to the present. The course covers not only the great Chinese inventions and the decline of Chinese science and technology and its consequences, but also more recent achievements and their relation to developments elsewhere in Asia and around the world.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 46600 - The Japanese Empire in the 20th Century

This course will examine Japan's modern history by considering historical work that reexamines the period of the Japanese empire, 1895-1945. Topics will include the dynamics of colonial culture, issues of gender and marginality, and emerging debates on wartime responsibility and memory.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 46700 - The Pacific War, 1931-1945

This course will explore significant milestones and issues of both U.S. and Japanese societies during the course of the Pacific War. Our focus will be on the human experience and changes that came to both societies as well as contemporary issues regarding the contested memory and responsibility of many aspects of the war.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 46800 - Architecture in Modern India

This course will explore the traditional (Hindu and Islamic), colonial, and modern representations of Indian architectural traditions of India. Central themes include: the political manipulation of architecture in different periods and its social and cultural influence in modern India.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 46900 - Indian Cinema and Popular Culture

This course will explore the social impact of Indian cinema and the making of the new culture of Bollywood. Central themes include: How has Indian cinema influenced social change? What has been its social and cultural impact in modern India?

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 47000 - Religions of India

This course will explore the many religious traditions of India, including the dominant Hinduism, along with Buddhism, Jainism, Islam, Sikhism, and Zoroastrianism. Central themes include the origins of each religious tradition; the philosophical underpinnings and the historical growth of each religion; and the social and political conflict/accommodation of multiple religious traditions in modern India.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 47100 - Pakistan: Religion, Military, and the State

This course will explore the complex ties between religion, politics, and military, while tracing the circumstances of the creation of Pakistan in 1947 out of British India. Central themes include: How was Pakistan created? How did the military usurp political Power. Notwithstanding a sizeable middle class, why does religion play such an important role in

Pakistan, and what ties does religion have with the military? Finally the central issue of Indo-Pakistan rivalry.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 47700 - The Vietnam War and U.S. Society

The Vietnam War presented in two ways: first, as several wars within Vietnam, including civil, revolutionary, and anti-colonial; second, as a war between the U.S. and Vietnam and its resulting conflicts within the U.S.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 48100 - Power and Resistance in Latin America

This course analyzes the history and culture of recent indigenous insurgencies in Latin America. Focuses on the interplay between historical memory, subaltern organization, and anti-systemic politics in the formation of cultures of resistance.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 48200 - Women and Gender Relations in Latin America

This course examines three broad themes in the history of Latin America and the Caribbean: colonial foundations of patriarchal relations; gender ideology and nation building; and gender transformations within the context of revolution and globalization.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 48400 - Modern Middle East

This course will introduce students to the history of the Middle East, including the region from North Africa to Afghanistan, in the nineteenth and twentieth centuries. Central themes include: modernizing attempts by the Ottoman and Qajar Empires in the face of European encroachment; transition from empire to nation-state; the role of religion in politics; Arab nationalism; and the role of tribes and oil in state formation.

Credits: 3. Contact Hours: 3 hours

HIST 48500 - Women and Gender in the Middle East

This course examines the history of women and gender from the rise of Islam to the spread of contemporary Islamic political movements. Particular attention will be paid to the ways in which religion shapes women's lives as well as the ways in which women shape religion, women's roles in political and social movements, gendered economic activities, and male-female relations.

Credits: 3. Contact Hours: 3 hr./wk.

HIST 48600 - Arab-Israeli Conflict

This course looks at a century of struggle between nationalist movements that have vied for control of the same territory. In the first fifty years, the conflict was more-or-less contained in territory under Ottoman and then British jurisdiction. In the second fifty years - from 1948 - the conflict widened as wars erupted every decade. The course considers the political, socio-economic, and cultural ramifications of the struggle.

Credits: 3. Contact Hours: 3 hr./wk.

HIST 48700 - Islamic Polit Mvmt

This course will introduce students to the history of the Middle East, including the region from North Africa to Afghanistan, in the nineteenth and twentieth centuries. Central themes include: modernizing attempts by the Ottoman and Qajar Empires in the face of European encroachment; transition from empire to nation-state; the role of religion in politics; Arab nationalism; and the role of tribes and oil in state formation.

Credits: 3. Contact Hours: 3 hours

HIST 48800 - History of African Nationalist Thought

A historical treatment of African nationalist thought with special emphasis on the social movements and processes that stimulated the ideological development of the nationalist leaders. Readings will include the writings of these leaders.

Credits: 3. Contact Hours: 3 hr./wk.

HIST 48900 - Power and Consciousness in Southern Africa

Focuses on the history of South Africa in the 19th and 20th centuries, from the period of Shaka Zulu to the end of Apartheid.

Credits: 3. Contact Hours: 3cr./ 3hr. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 49100 - Decolonization in Africa and the Caribbean

Analyzes the rise of independence movements in Africa and the Caribbean. Countries to be studied include Kenya, Guyana, Ghana, Algeria, Jamaica, Zimbabwe, Angola, and Trinidad & Tobago.

Credits: 3. Contact Hours: 3cr. / 3hr. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HIST 49300 - Einstein and His World

Albert Einstein was a towering influence over the 20th century not only because of his epoch-making discoveries in physics but also because of his active involvements in social and political debates in his world. This course will introduce to students Einstein's scientific achievements as well as his views on the social, political, and religious issues of his day.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Junior standing, one 300-level course in history, or instructor's permission.

HNDI - Hindi Course Descriptions

HNDI 12300 - Introductory Hindi I

An introductory course in the spoken and written language. In addition to classroom hours, students will be expected to do some work in the language laboratory.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center.

HNDI 12400 - Introductory Hindi II

An introductory course offering further practice in spoken and written Hindi. In addition to classroom instruction, students will also work on aural/oral skills at the Language Media Center.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: HNDI 12100 or permission of the instructor. HNDI 12300 or placement.

HNDI 22600 - Intermediate Hindi

A one-semester Hindi course at the intermediate level. This course will review the grammar of the Hindi language, enhance vocabulary, increase fluency in reading and writing, and will include literary and cultural content. The four basic skills of listening, speaking, reading comprehension and writing will be further developed through class discussions, writing exercises and the use of multimedia and the Internet.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: HNDI 12400 or placement exam.

IAS - Interdisciplinary Arts and Sciences Course Descriptions

IAS 10000 - Writing for Interdisciplinary Studies I

Writing for Interdisciplinary Studies I and II are humanities-based writing courses. Reading includes a wide range of essays, each proposing a groundbreaking theory pertinent to a particular discipline. These essays will be matched with short fiction and shorter essays providing a social context for the theories proposed by writers such as Sigmund Freud, Karl Marx, Dr. Martin Luther King, Carl Jung, Alice Walker and Virginia Woolf, Thomas Kuhn, Charles Darwin and others. In response to these combinations, text-based student essays of at least 750 words will pair interdisciplinary theory with a social context. These courses emphasize critical reading, thinking, and writing skills as well as various rhetorical approaches to the composition of the academic essay.

Credits: 4. Contact Hours: 4 hr./wk.

IAS 10100 - Writing for Interdisciplinary Studies II

Core Humanities II is an interdisciplinary humanities-based writing course built on critical reading, thinking and writing skills. Students read theoretical essays by authors such as Charles Darwin, Thomas Kuhn, Georg Simmel, Friedrich Nietzsche, and Hannah Arendt, paired with social context writers such as Gabriel Garcia Marques, Flannery O'Connor and Michael Gold. Students will respond to these combinations by producing a text-based essay of at least 1250 words that includes proper citation of sources. This course will emphasize critical reading, writing and thinking skills as well as a number of more complex rhetorical approaches to the composition of text-based academic writing.

Credits: 4. Contact Hours: 4 hr./wk.

IAS 10300 - Interdisciplinary Global Studies

This course examines the historical phenomena of globalization through the various lenses of the social sciences and the humanities from the year 1500 to the present. It is a foundational course for the department's concentration in History, Politics, and Society.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: None.

IAS 10400 - Nature & Human Beings I

Designed as an overview of the basic concepts and experiments in the physical sciences and biology, this course provides students with the foundational knowledge required to decipher scientific methodology and contemporary scientific knowledge. Another important goal is to convey an appreciation of both the possibilities and limitations of science and technology.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: IAS 10000, IAS 10100, IAS 10200, IAS 10300.

IAS 10500 - Nature and Human Beings II

This course will broaden students' understanding of fundamental ideas in physical science as well as the interaction of science with society. Students will use their understanding of scientific method and model building to explore the possibilities and limitations of science and technology. Students will also examine the origin and evolution of the universe, earth and life through research and hands-on explorations.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: IAS 10000, IAS 10100, IAS 10200, IAS 10300.

IAS 10800 - Doing Social Research

Doing Soc Research

Credits: 4. Contact Hours: 4 hr./wk.

IAS 22300 - Introduction to Public Administration

Public Administration as viewed through the lens of urban management. Explores the place of city governments in the system of

intergovernmental relations; examines trends in the restructuring of urban governance and the delivery of public services; reflects on the politics of urban development and planning.

Credits: 4. Contact Hours: 4 hr./wk.

IAS 23304 - The Essay

Students read a variety of essays and memoir across disciplines, time periods, and cultures; discuss examples of published work that address issues of craft; write academic and personal essays; and learn to critique the writings of others.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: IAS 10000 and IAS 10100 or the equivalent.

IAS 23324 - Advanced Composition

This course builds on interdisciplinary reading, writing, and research skills by inviting students to apply a variety of critical modes to a number of interdisciplinary text (literature, art, film, the law, primary historical documents.)

Credits: 4. Contact Hours: 4hr/wk Prerequisite: IAS 10000 and IAS 10100 or the equivalent.

IAS 24200 - Introduction to Interdisciplinary Studies

This course explores the establishment, growth, and transformation of academic knowledge in the humanities, natural sciences, and social sciences. It exposes students to the diversity of academic inquiry and the different traditions and vocabularies of humanistic, scientific, and social scientific inquiry, while exploring the potential and limits of interdisciplinary inquiry.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: None.

IAS 30100-30300 - Honors Research

A program of individual reading and interdisciplinary research under the guidance of faculty members specializing in the student's area of concentration. Approval of the Dean and program director required. Apply no later than December 10 for the Spring term and May 1 for the Fall term.

Credits: 4. Contact Hours: 4hr/wk Prerequisite: None.

IAS 31100-32000 - Selected Topics in Interdisciplinary Arts and Sciences

A changing series of innovative and experimental interdisciplinary courses on topics not covered in regular courses.

Credits: 1- 4 cr. (variable). Contact Hours: Hours and credits variable. 1-4 hr (variable)/wk.

IAS 31106 - Works on Paper

Is paper just for drawing? Works on Paper will encompass various ways that artists use paper to create and express visual and conceptual ideas. The course will use paper as the foundation for students to explore materials and methods by which they can develop various works of art. Through practice, theory, research and discussion, students will learn to use the artist's basic tools, nurture a creative perspective by which to engage in art, and develop artistic sensibilities. Materials fee in lieu of text.

Credits: 4. Contact Hours: 4hr/wk

IAS 31120 - Math Lab Intdsc Stud

Credits: 1. Contact Hours: 1 hour

IAS 31170 - Seminar in Autobiography

The Seminar in Autobiography is the first step in the CWE Autobiography Program. This initial course introduces students to the genre of life writing, which encompasses different styles and forms of autobiography and memoir, such as the coming-of-age narrative, family history, the personal essay, and memoirs of illness, grief, trauma, and recovery. The course involves studying the basic types of life writing, completing some introductory life-writing exercises, reading and

analyzing several autobiographies, and, finally, creating an autobiographical story.

Credits: 4. Contact Hours: 4 hr/wk

IAS 31216 - Women and Work

This course examines the impact of women workers on contemporary U.S. society and the role of work in women's lives. Women are most unlike male workers because they have two work sites: in the paid labor force and in the household. This course focuses on the intersection, conflicts, and tensions within as well as between these work sites. The primary goal of the course is to provide students with the ability to understand the social, economic, and historical contexts of their lives as workers.

Credits: 4. Contact Hours: 4 hr./wk.

IAS 31235 - Introduction to Developmental Disabilities

This course will provide an overview of the field of developmental disabilities using interdisciplinary approaches to survey the nature, diagnosis, and treatment of such disorders as intellectual disability, autism, epilepsy, learning disabilities, and cerebral palsy. Advocacy, the role of the law, and education will be examined.

Credits: 4. Contact Hours: 4 hr/wk

IAS 31280 - Women and the Law

Have women come a long way? Through original source materials, including autobiography, fiction and film we will study the evolution of women's rights in the United States. Our study will include topics such as women and reproductive rights, women and the workplace, women in the American criminal justice system and in the law enforcement and legal professions.

Credits: 4. Contact Hours: 4hr/wk

IAS 31292 - Intro Urban Stud Pla

Credits: 4. Contact Hours: 4 hours

IAS 32181 - Book Talk Series

The Book Talk Series was introduced in Fall 2008 by the Distinguished Lecturers and Endowed Chairs of CCNY and CUNY Lecture Series. Since then CWE has offered Book Talks on varied subjects such as: W.W. Norton Published Authors; Writers on Writing; Aesthetic and Cultural Expressions of African Derived Religions; The Child; and City on City. Book Talks offers students opportunities to explore topics through an interdisciplinary approach as they attend a series of lectures by authors whose works make up the course readings.

Credits: 4. Contact Hours: 4 hr/wk

IAS 49000 - Capstone in Interdisciplinary Studies

This capstone seminar provides a culminating experience for students completing an interdisciplinary concentration in the Department of Inter-disciplinary Arts and Sciences. The seminar will explore a theme through readings and a series of guest lectures that provide multiple disciplinary perspectives. Final research projects will synthesize and integrate the perspectives of these different disciplines. Course theme will vary but might include topics such as The City, The Child, or Human Rights. Repeatable for credit once.

Credits: 4. Contact Hours: 4 Prerequisite: IAS 24200, IAS 23304 OR IAS 23324 and at least two advanced electives.

INTL - International Studies Course Descriptions

INTL 20100 - International Studies: A Global Perspective

Global problems, including the danger of war, imbalances in the international political economy, and the importance of Africa, Asia, and Latin America are examined. Competing world views are evaluated in

light of key concepts, e.g., state power, race, ethnicity, class, imperialism and revolution, and are developed through case studies. The future of world order as well as alternative strategies for global transformation are considered.

Credits: 3. Contact Hours: 3 hrs./wk. Prerequisite: World Civilizations and two courses in social science. Normally taken in the sophomore year.

INTL 25100-25200 - Internship in International Studies

Service as an intern engaged in research and other independent work in governmental or non-governmental organizations concerned with international affairs. Students will write an analytical term paper on a topic related to their internship. A second semester internship may be taken as an elective. Students may also work as interns during the summer for 3 or 6 credits with faculty supervision.

Credits: 3. Prerequisite: Approval of the instructor. HTBA

INTL 30100 - Honors Senior Seminar

Review and analysis of secondary literature to prepare students for thesis writing.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: GPA of 3.5 and approval of instructor.

INTL 30200 - Honors Senior Thesis

Preparation and writing of Honors Senior Thesis.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Honors Senior Seminar.

INTL 30500 - Social Foundations of International Studies

A required core class offering an introduction to key themes and theories from the social sciences. More specifically, the course draws on the intellectual foundations of cognate social science disciplines (Anthropology, Economics, Geography, Political Science and Sociology) to identify a common theoretical core, which can be used to conceptualize, analyze and understand contemporary issues in International Studies. Understanding these shared theoretical foundations empowers students to take up research questions that cut across these artificial divisions. The focus of this course is the cultural interaction among diverse groups in the world. Intercultural relations are examined through key themes such as religion and value systems, racial and ethnic relations, cultural identity, women's experience in different cultural settings, intercultural communication and forms of contemporary artistic expression. Students seeking a concentration in Culture and Communication, Comparative Civilizations, Area Studies and Education may substitute this course for the core course 20200: Comparative Political Economy.

Credits: 3. Contact Hours: 3 hrs./wk. Prerequisite: INTL 20100.

INTL 31107 - Rsch Mthds Intl Stds

Credits: 3. Contact Hours: 3 hours

INTL 31108 - Transnational Femini

Credits: 3. Contact Hours: 3 hours

INTL 31111 - Social Change in the Middle East

This class is a multi-disciplinary overview of the political and social change that has occurred in the Arab Middle East since the early 2000s but more specifically focusing on the years following 2010. The class will give an overview of what has been deemed the "Arab Spring," specifics "areas" in which we can judge change, such as gender, and the legacy colonialism and imperialism has had in the region.

Credits: 3. Contact Hours: 3

INTL 32100 - Senior Seminar in International Studies

This seminar is the capstone of the International Studies major. It brings to bear on one or more major international or global problems the approaches and insights of the several disciplines that comprise the major. The course consists of a community-based research project, which emphasizes the five primary learning competencies required of all

INTL students (but in an applied, small group context). This seminar requires students to develop a professional portfolio of their knowledge and skills, which is to be presented as the final graduation requirement.

Credits: 3. Contact Hours: 3 hr./wk.

INTL 32200 - Senior Essay in International Studies

An essay dealing with an international or global problem or issue that demonstrates breadth of background, skill in research and critical evaluation of relevant literature. Normally the work on the essay will extend over two semesters, beginning in the fall semester of the senior year with INTL 32100. Independent work

Credits: 3. Prerequisite: Senior standing, completion of writing course and English proficiency requirements, and approval of the Program Director.

INTL 32400 - Public Policy Portfolio

Credits: 3. Contact Hours: 3 hr./wk Prerequisite: Senior Seminar in International Studies.

ITAL - Italian Course Descriptions

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which are numbered 123, 124 and 226.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

ITAL 12300 - Introductory Italian I

An introductory course using a communicative approach to develop conversational skills and provide the student with a foundation in Italian grammar, pronunciation and vocabulary.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

ITAL 12400 - Introductory Italian II

A continuation of Italian 12300 using a communicative approach to develop conversational skills and provide students with further study of Italian grammar and vocabulary.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: ITAL 12300.

ITAL 22600 - Intermediate Italian

A one-semester Italian course at the intermediate level. This course will review the grammar of the Italian Language, enhance vocabulary, and will include literary and cultural readings. It will further develop listening, speaking, reading comprehension, and writing skills through class discussions and the use of multimedia and the Internet.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: ITAL 12400 or placement.

ITAL 28100 - Dante to Machiavelli

Dante's and Boccaccio's Decameron, a selection of Petrarch's love poetry, and Machiavelli's *The Prince*.

Credits: 3. Contact Hours: 3 hr./wk.

ITAL 28200 - Pirandello to Moravia

The great authors of modern Italian literature: Pirandello, Svevo, Vittorini and Moravia.

Credits: 3. Contact Hours: 3 hr./wk.

ITAL 28700 - Italian Cinema and Literature

A study of the different relationships that have occurred between Italian film and literature in this century. The cinematic translation of literature

will be reviewed through the works of Visconti, Pasolini, DeSica, Bertolucci, Antonioni, Rossellini, Fellini and others.

Credits: 3. Contact Hours: 3 hr./wk.

ITAL 30103-30300 - Honors I-III

Credits: Variable cr., 1-4.

ITAL 31000 - Independent Study

Credits: Variable cr., 1-4.

ITAL 31100-32000 - Selected Topics

A series of advanced courses to be offered with varying frequency on selected topics not generally covered in the set course offerings.

Credits: Variable cr., 1-3.. Contact Hours: Variable, 1-3 hr./wk. Prerequisite: ITAL 32100 and ITAL 32200.

ITAL 32100 - Problems of Italian Grammar

An advanced and intensive course that focuses on Italian grammar. It is a fundamental and required course for Italian majors and minors as well as for students interested in improving their language and conversational skills.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ITAL 22500 or placement by department.

ITAL 32200 - Practice Writing in Italian

This is an advanced and intensive writing class for students who wish to develop the skills necessary to prepare students for literature courses and other classes in which they are expected to produce term papers, to answer questions, and to otherwise develop their ideas in writing. The course will include descriptive, narrative, and expository prose as well as summary and argumentation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ITAL 22500 or placement by department.

ITAL 32300 - Spoken Italian

Practice in conversation with emphasis on contemporary idiomatic speech. Discussions of topics of current interest.

Credits: 3. Contact Hours: 3 hr./wk.

ITAL 35100 - Introduction to Italian Literature I

A survey of Italian literature from the Middle Ages to the end of the 17th century, with emphasis on the different styles and periods and on the characteristics of the representative genres.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ITAL 22500 or placement by department.

ITAL 35200 - Introduction to Italian Literature II

A survey of Italian literature from the 18th century to the present, with emphasis on the different styles and periods and on the characteristics of the representative genres.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ITAL 22600 or placement by department.

ITAL 42200 - The Divine Comedy

A reading of the *Divine Comedy* within the political, religious and intellectual background of Dante's time.

Credits: 3. Contact Hours: 3 hr./wk.

ITAL 42300 - Boccaccio and the Decameron

This course will focus on the study of the *Decameron*, the world-renowned masterpiece written by Boccaccio in the middle of the 14th century. In particular, it will undertake close readings of selected "novella," trying to figure out the main characteristics of Boccaccio's work and ideas and his influence on the European literature. It will also place the masterpiece in its social and historical context, trying to

analyze its possible sources, its language and style, and its author's view about Church, State and morality.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ITAL 22500 or placement by department.

ITAL 42400 - Renaissance Literature

Study of the major works written during the Italian Renaissance with an emphasis on their cultural, political and aesthetic context. The topics will vary.

Credits: 3. Contact Hours: 3 hr./wk.

ITAL 42500 - Machiavelli and *Il Principe*

This course will focus on the study of the *Il Principe*, the world-renowned masterpiece written by Machiavelli in the second half of 1513. In particular, it will undertake close readings of selected chapters, trying to figure out the main characteristics of Machiavelli's work and ideas and his influence on the European literature. It will also place the masterpiece in its social and historical context, trying to analyze its possible sources, its language and style, and its author's view about Church, State and morality.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ITAL 22500 or placement by department.

ITAL 43200 - Contemporary Literature

Major currents in the poetry, fiction and drama. Topics will vary.

Credits: 3. Contact Hours: 3 hr./wk.

ITAL 43300 - Italian Women Writers of the XX Century

This course focuses on reading and analyzing selected works of renowned Italian women writers of the XX century. The selection of works covers a variety of genres: novel, short story, journalistic enquiry, essay and poetry. Occasionally, movies that are based on texts read in class will be shown. Students will participate in class discussions and write papers to demonstrate close reading skills, to express individual interpretation, and to understand the common themes and unique literary characteristics of the genre. Topics include love, motherhood, education, folly, politics and social issues, among many others. The course also covers cultural and historical contexts that influenced the authors.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ITAL 22500 or placement by department.

ITAL 43400 - Italian Short Stories from the XX Century to Contemporary Writers

This course focuses on reading and analyzing selected short stories of renowned Italian writers of mainly the XX and XXI Centuries. Students will participate in class discussions and write papers to demonstrate close reading skills, to express individual interpretation, and to understand the common themes and unique literary characteristics of the genre. The course also covers cultural and historical contexts that influenced the authors.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ITAL 22500 or placement by department.

ITAL 45000 - Italian Culture and Civilization

The course will attempt to set forth the uniqueness of Italian civilization and to show how these qualities have been transmitted from Italy to other nations.

Credits: 3. Contact Hours: 3 hr./wk.

ITAL 49900 - Experiential and Service Learning

An experiential or service learning opportunity that provides students with the chance to use the skills and knowledge they have acquired in understanding, speaking, reading, and writing in the target language in a real-world context. Experiential learning internships allow students to develop career and academic goals by training in private and public sector jobs that depend on linguistic and cultural fluency in languages

other than English. Service learning opportunities are focused on enabling students to use language skills in order to positively impact individuals and organizations in the wider community. Credit is subject to approval by the Director of Experiential and Service Learning in CMLL.

Credits: 1-3. Contact Hours: Variable Prerequisite: A total G.P.A. of 2.5 or above; completion of a minimum of 15 credits toward the major with a G.P.A. in the major of at least 2.5.

JAP - Japanese Course Descriptions

JAP 12300 - Introductory Japanese I

An introductory course in spoken and written Japanese. In addition to classroom instruction, students will also work on aural/oral skills at the Language Media Center.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

JAP 12400 - Introductory Japanese II

An introductory course offering further practice in spoken and written Japanese. In addition to classroom instruction, students will also work on aural/oral skills at the Language Media Center.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center. Prerequisite: JAP 12300 or placement.

JAP 22600 - Intermediate Japanese

A one-semester Japanese course at the intermediate level. This course will review the grammar of the Japanese language, enhance vocabulary, and will include literary and cultural readings. It will further develop listening, speaking, reading comprehension, and writing skills through class discussions and the use of multimedia and the Internet.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: JAP 12400 or placement exam.

JAP 30500 - Conversational Japanese

Presents rotating, semester-long topics that provide practice in basic speaking skills in Japanese. Involves intensive practice of the spoken language, especially aural comprehension, oral production, correct pronunciation, and idiomatic speech.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: JAP 22600 or placement by examination.

JWST - Jewish Studies Course Descriptions

JWST 10000 - Introduction to Jewish Life and Religion

The traditional life and religion of the Jews and the ways that they have changed during the modern period. The ideals of Jewish religion; the nature of man, creation, revelation and redemption. The pattern of life in the pre-modern and modern worlds in relation to changes in the values held by Jews.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 10411 - Psychology of Religion

Understanding religious behavior through the language of psychology. Freud, Fromm, Maslow, Hillman, and others are considered.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 10500 - Jewish Law and Ethics

This course will serve as an intense introduction to the field of Jewish Law and Ethics. We begin with an examination of Kohlberg's six stages of moral development, and then enter into a survey of halakhik literature with Biblical, Rabbinic, and Medieval source materials.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 11200 - Introduction to Sephardic Literature

Explores the culture and history of Sephardim using their literature as an attempt to understand how Sephardic Literature differs from Ashkenazi Jewish literature, as well as other types of Jewish and world literature. Readings will be divided into three main sections: Religious material, Secular Philosophy and Secular Poetry, and contemporary selections including holocaust writers.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 11300 - Introduction to Jewish Literature

Surveys the literature and culture of the Jews from the Bible onward, tracing the evolution of the text as a central concern of Jews throughout the centuries in legal, linguistic, religious, and cultural terms. Jewish American fiction will round out the course, along with a taste of Modern Hebrew literature, underscoring the urgency of Biblical themes and religious tradition, translated and reworked for modern eyes and ears.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 11400 - Introduction to Jewish American Literature

Traces the experience of Jews in America from the beginning of the 20th Century to the present moment, garnering from characters and their stories a particular understanding of Jewish American identity and a more universal appreciation of the general human condition and its wants, needs, hurts, and loves.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 11700 - Bible as Literature

Introduces students to selected texts from the Hebrew Bible. Students read English translations of these texts and address questions of translation, historical truth, myth, belief, and notions of contemporary relevance. Students compare these primary texts to secondary texts--works of fiction or criticism that use the Bible as a starting point. Intended to give students an awareness of how a literary understanding of the Bible can enhance their appreciation for contemporary modes of storytelling.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 14100 - Jewish Life in New York

Considers cultural, linguistic, religious, and nationalistic aspects of Jewishness in New York. The class will view several films and hear presentations by experts in the Jewish communal life of New York.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 20200 - History of God

Surveys contemporary scholarship on the history and evolution of God in Judaism, Christianity, and Islam. Uses historical critical approaches to scripture, as well as evolutionary, philosophical, theological, and psychological interpretations of scripture. Studies the history of the idea of God, covering a wide variety of interpretations and strategies for reading religion.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 20400 - History of the Afterlife

This course is divided into two parts. The first part explores contemporary Western attitudes and research on the afterlife. The second part examines how the Jewish concept of the afterlife has evolved from the early biblical period until now.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 20500 - Jewish Spiritual Medicine

Explores the role of Jewish tradition in directing Jews towards the healing arts, the biblical, rabbinic and kabalistic texts that encouraged Jews to study and practice medicine and the traditional approaches to healing taught by Jewish tradition.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 20700 - Jesus the Jew

This course examines the figure of Jesus from a Jewish perspective. We see Jesus as a product of Herodian politics, the charismatic influences of Rabbi Hillel and Rabbi Shammai, the mystical Essene community based near Qumran, and the Hellenization of Judaism in the first century. We also consider the figure of Jesus as a Jew in the early Christian movements, especially in the Ebionite Christian communities. Issues such as the adherence to Law, Rabbinic interpretation of Law, the messianic movement, prophecy, magic, social reform, and growing anti-Semitism will be discussed.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 21100 - Contemporary Israel

Society and culture in the State of Israel. Contemporary social accomplishments and problems; the conflict of national liberation and normalization; the integration of ethnic Jewish groups; creation of a mixed economy; the coexistence of religion and secularity; the relation of the State of Israel to Jews elsewhere.

Credits: 3. Contact Hours: 3 hours

JWST 21300 - Humor and Despair in Modern Jewish Fiction

Examines the literary trajectory of the American Jew from his immigrant beginnings to his contemporary lifestyle with respect to the depth of human feeling. Characters seem to straddle two emotional camps: the joyful and the melancholy. Investigates character development, narrative style, and the ways in which Jewishness informs the central themes of humor and despair.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 21400 - Angelic and Demonic in Modern Jewish Fiction

Investigates the angels and demons, real and imagined, that populate Jewish American texts of the second half of the twentieth century. Discusses the ways in which such manifestations might be understood. Do demons represent history's calamities? Do angels stand in for the high moments? How are characters informed by their relationship to their heritage? How do they confront their inner angels and demons?

Credits: 3. Contact Hours: 3 hr./wk.

JWST 21500 - Dreams-Nightmares in Modern Jewish Literature

Examines the way in which Jewish writers transmute their worries and aspirations into a literature of nightmares and dreams while reading about characters who find that the real world is just one step removed from the imagined. Where do these nightmares and dreams come from? From religious or cultural history? From personal or familial struggles? What purpose do they serve? How do they make us feel when we read about them?

Credits: 3. Contact Hours: 3 hr./wk.

JWST 21600 - The Stories of Isaac Bashevis Singer

Examines the fictional universe of one of the 20th century's master storytellers, Isaac Bashevis Singer. Discussion of his many different literary locales: his Old Worlds, the Eastern European shtetl, his Warsaw, and his New Worlds, New York and Miami Beach, and explores the way his characters inhabit these worlds.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 21700 - Saints and Sinners in Jewish Literature

Investigates modern Jewish fiction through highly specialized lenses. The categories of "Saints and Sinners" apply to the characters in our novels and stories, suggesting people who do right or wrong, either to the world around them or to themselves. Considers notions of the saintly, the good, the perfect, and notions of the sinful, the wrong-headed, the evil, as they apply to world events, world views, worldly pursuits. Discusses the specific ways Jewishness informs our perception

of the good and the evil, especially with respect to Biblical precedent, Jewish law, and a contemporary ethical society.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 23100 - Israeli Film

The history of Israeli cinema from 1932 to the present. Explores some of the major narratives and genres. We will also try to understand why recent Israeli cinema has become so appealing to international audiences. Investigates how these films reflect the inner voices of wide segments of the Israeli population, as well as the identities of some minorities.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 23200 - Jews in Film and Fiction

This class explores the portrayal of Jewish characters in (mostly) post-WWII fiction and film. It discusses the depiction of Jewish identity and asks what role religion plays in these depictions. It also looks at the representation of women and men, parents and children, the importance of bearing witness to tragedy, and it investigates the way in which stories change when subjected to different media, discussing, in general, the larger questions that are posed by being Jewish in America.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 28100 - The Holocaust

The course introduces students to the Nazi Holocaust by means of a survey of historical materials, survivor testimonies, films, archives, and guest speakers.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 30100-30300 - Honors I-III

Approval of Dean and program required. Apply not later than December 10 in the Fall term or May 1 in the Spring term.

Credits: Variable cr.. Contact Hours: Variable cr., usually 3 cr./sem.

JWST 30200 - Jewish Mysticism

Introduces students to the mystical tradition within Judaism and explores its impact on Judaism today. In addition to surveying the history of Jewish mysticism, it studies the major texts and charismatic personalities of Jewish mystics from the time of the Bible to contemporary times. Particular attention will be focused on the mystical elements within the movement known as Hasidism.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 31000 - Independent Study

Research on topics not covered by regular Departmental offerings, by individual arrangement with the instructor and with program permission.

Credits: 1-4.

JWST 31100-32000 - Selected Topics in Jewish Studies

From semester to semester the Department offers elective courses not listed in the bulletin. Topics to be covered and names of instructors will be announced during the preceding semester.

JWST 31107 - Recent Israeli Film

Credits: 3. Contact Hours: 3 hours

JWST 31113 - The Hollywood Jew

Credits: 3. Contact Hours: 3 hours

JWST 31116 - Jew In European Film

Credits: 3. Contact Hours: 3 hours

JWST 31402 - Israel-Palest Film

Credits: 3. Contact Hours: 3 hours

JWST 31605 - Biblical Archaeology

Examines the myriad issues in Biblical archaeology, including the chronological periods not mentioned in the Bible, the establishment of the early farming communities, and later Bronze and Iron age cities, the interconnections with neighboring cultures, and the archaeology of conquest (Assyrian, Babylonian, Greek and Roman). Considers not only the archaeological record in how it conforms to the Bible but how it may contradict it, and explores not only temple and city structures but the remains of cult and daily use objects.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 32200 - The Woman in Modern Jewish Fiction

This course will survey short stories and novels by modern Jewish writers, and focus on the characterization of the Jewish woman. The class will explore what, if anything, constitutes the essence of the Jewish woman character. What effect does history have on the formation of these women as strong or weak personalities? How do societal pressures exert themselves on a Jewish woman? Does the woman as intellectual character constitute a threat to her male counterparts? Is there such a thing as "the typical Jewish mother?" Fiction by Malamud, Roth, Ozick, Tillie Olsen, Grace Paley, Delmore Schwartz, I.B. Singer, and others.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 32300 - Modern Jewish Writers: Philip Roth and Cynthia Ozick

This course will introduce students to selected texts by two authors, Philip Roth and Cynthia Ozick. Students will get to know these authors through an exploration of biographical material, a reading of primary texts, and a careful selection of relevant critical material. By the semester's end, students will feel confident in their abilities to identify these writers and some of their central concerns. Students will see how these writers fit into the larger Jewish and Jewish literary tradition.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 33100 - The Holocaust in Film

Examines the Holocaust through the medium of film. The problematic portrayal of genocide through a medium often associated with entertainment, the various images of the Jew, the differences in how nations directly involved react to and represent the Holocaust in film, narrative cinematic strategies used to depict this complex event are considered.

Credits: 3. Contact Hours: 3 hr./wk.

JWST 34200 - Jews Of Latin Amer

Credits: 3. Contact Hours: 3 hours

JWST 44500 - Jews of Morocco

This advanced seminar is an intense introduction to the history, culture, and religious life of the Jewish community in Morocco. A five-day itinerary in Casablanca, Marrakech, and the High Atlas mountains will serve as a fieldwork component for this course.

Credits: 3. Contact Hours: 3 hr./wk.

KOR - Korean Course Descriptions

KOR 12300 - Introductory Korean I

Emphasis is on pronunciation of basic everyday vocabulary and simple grammar through conversation and drills based on a situational approach. The reading and writing practice of Korean script is introduced. Videos are shown to familiarize the students with the language speakers and their culture.

Credits: 4. Contact Hours: 4 hr./wk plus 1hr. at the Language Media Center

KOR 12400 - Introductory Korean II

A continuation of KOR 12300 (p. 78) that includes practice and drills in conversation using basic structural patterns and reading of simple texts chosen for this level.

Credits: 3. Contact Hours: 4 hr./wk., plus 1 hr. at the Language Media Center Prerequisite: KOR 12300 Introductory Korean I

LALS - Latin American and Latino Studies Course Descriptions

LALS 10100 - The Heritage of the Spanish Antilles

The historical, cultural and ethnic forces that have shaped the character of the Hispanic people of the Caribbean. The variety of societies and cultures of the Hispanic Caribbean in their historical and contemporary setting up to and including the migration of Caribbean people to urban North America.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 10200 - Latin American and Caribbean Civilizations

A survey of Latin America's economic, social, political, and cultural development from the Pre-Columbian era to the present. The course will focus on selected topics and themes including: colonization and resistance to colonization; the formation of social structures and labor systems; patterns of dependent development; reform, revolution, and counter-revolution.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 12200 - Puerto Rican Heritage: 1898 to Present

A survey of the cultural history of Puerto Rico. Special attention will be given to cultural conflicts and assimilative influences, as well as the existing relations between Puerto Rico and the United States.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 12300 - Dominican Heritage

A survey of the cultural development of the Dominican Republic from pre-Columbian times to the present. Special consideration will be given to socio-economic and political developments and the relationship that exists between the Dominican Republic and the United States.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 12600 - Hispanics in the United States: Migration and Adjustment

The socioeconomic and political origins of migration and the impact that American society has had on mainland Hispanic communities in areas of housing, employment, education, family structure, social mobility, and community development.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 13100 - The Hispanic Child in the Urban Environment

A survey of the sociological, psychological and educational needs of Hispanic children in the New York City public schools. Emphasis will be given to the study of language problems, family structure, race relations and community life.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 13200 - The Contemporary Hispanic Family

A study of change in Hispanic family structure from the early colonial period to the present day. Stress will be placed on moral values, religious beliefs, interpersonal relations, and family organization.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 22600 - Antillean Literature

Comparative study of literature in the Spanish Antilles. Special emphasis on contemporary works. Class conducted in Spanish.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 23800 - Dominican Heritage: From Trujillo to the Present

An in-depth study of the sociocultural and historical realities of the Dominican Republic from 1930 to the present. The course will also cover the Dominican migration and the growth of the Dominican community in the United States.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 27100 - Social Welfare in the Hispanic Community

A study of the social welfare system as it affects Hispanics and other minorities. Changing concepts of social welfare in the United States, Spain and Latin America from Juan Luis Vives to the present.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 29100 - Culture and Health: Hispanics and Other Minorities

Different cultural values and beliefs will be examined as they relate to illness, treatment of the sick, readjustment, rehabilitation, health maintenance, and prevention. Emphasis on case studies of culture clash. Incorporating or rejecting cultural beliefs in planning health education and change.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 29200 - Health Care Planning and the Hispanic Experience

The economic, social, political and ethical issues involved in planning health programs. Comparison of health care programs as they affect Hispanics and other minorities.

Credits: 3. Contact Hours: 3 hr./wk.

LALS 30100-30400 - Honors

Advanced independent work for outstanding majors in their upper junior and senior years. Honors will be granted to graduating seniors on the basis of research and a comprehensive written examination. Admission to the Honors course requires (a) a 3.2 average in courses taken in the Latin American and Hispanic Caribbean Studies Program since the freshman year and (b) approval of the Honors Supervisor. Application for admission must be made no later than December 10 in the Fall term and May 1 in the Spring term.

Credits: Variable cr..

LALS 31000 - Independent Studies

Independent research under the supervision of LALS faculty. Open to students in their senior year only, or with permission of LALS advisor.

Credits: 1-4. Contact Hours: Hrs. to be arranged

LALS 31100 - Decon Dominican Iden

Credits: 3. Contact Hours: 3 hours

LALS 31100-32000 - Selected Topics

Advanced study in selected topics related to Latin American and Hispanic Caribbean Studies.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: To be established by the instructors.

LALS 31102 - Carib Magic & Spirit

Credits: 3. Contact Hours: 3 hours

LALS 31301 - Puerto Rica & Dominic

Credits: 3. Contact Hours: 3 hours

LAT - Latin Course Descriptions

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or

concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which are numbered 121, 122, 252, and 353.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

LAT 12100-12200 - Elementary Latin

An introduction to the Latin language, to the Latin roots of English and the Romance languages, and to the civilization of the ancient Romans. Prepares students to read Latin literature.

Credits: 3 cr. each. Contact Hours: 4 hr./wk.

LAT 25200 - Selections from Latin Prose

Students will complete their study of the grammar of the Latin language and proceed to readings from Cicero and other prose authors.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: LAT 12100-12200 or two years of Latin in high school.

LAT 30100-30300 - Honors I-III

Approval of Dean and Department Honors Supervisor required. Apply in NA 5/225 no later than December 10 in the Fall term or May 1 in the Spring term.

Credits: Variable cr..

LAT 31000 - Independent Study

Approval of Department required before registration.

Credits: 1-4.

LAT 31100-32000 - Selected Topics

A series of advanced courses to be offered with varying frequency on selected topics not generally covered in the set course offerings.

Credits: Variable cr. 1-3.. Contact Hours: Variable 1-3 hr./wk.

LAT 35300 - Virgil

Selections from the *Aeneid*.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: Three years of high school Latin, three semesters of college Latin or permission of the department.

MATH - Mathematics Course Descriptions

MATH 15000 - Mathematics for the Contemporary World

Bombarded by statistics, assailed by advertisers and advocates of all persuasions, the average person needs mathematics to make sense of the world. This course aims to give students the tools needed to critically examine the quantitative issues of our times. Students will learn the basics of logical reasoning, the use of graphs and algebra to create quantitative models, and the role of statistics and probability in analyzing data. We will apply these ideas to assess the quantitative claims raised in contemporary case studies commonly discussed in the media.

Credits: 3. Contact Hours: 3 hr./wk.

MATH 15004 - Math For Contemporary World

Bombarded by statistics, assailed by advertisers and advocates of all persuasions, the average person needs mathematics to make sense of the world. This course aims to give students the tools needed to critically examine the quantitative issues of our times. Students will learn the basics of logical reasoning, the use of graphs and algebra to create quantitative models, and the role of statistics and probability in analyzing data. We will apply these ideas to assess the quantitative claims raised in contemporary case studies commonly discussed in the media.

Credits: 4. Contact Hours: 4 hr./wk.

MATH 17300 - Introduction to Probability and Statistics

Descriptive statistics and frequency histograms; measures of location and dispersion; elementary probability; permutations and combinations; multiplication rule and conditional probability; Bayes' Theorem; independent events; random variables, expected values; applications to binomial, hypergeometric, uniform and normal distributions; the Central Limit Theorem; testing statistical hypotheses; correlation; linear regression and least squares.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: Placement by the Department.

MATH 17700 - Introduction to Biostatistics

The course is designed to provide an introduction to statistics for the biomedical researcher. Topics include: descriptive statistics, fundamentals of hypothesis testing, estimation, confidence intervals, Z-tests, t-tests, chi-squared tests, analysis of variance, linear regression, nonparametric tests, survival analysis and odds ratio. Biomedical applications and software implementation are emphasized for each topic.

Credits: 3. Contact Hours: 3 lect., 1 lab. hr./wk. Prerequisite: Placement by the Department.

MATH 18000 - Quantitative Reasoning

Investigation of the basis for elementary operations in concrete situations, diagrams, and symbolic representation. Understanding of, and problem-solving in, the following areas: numerical operations, ratios and percents, linear and exponential growth in situations, formulas, and graphs; rate of change; geometry of measurement; units, dimension, and scaling.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: Placement by the Department.

18004 - Quantitative Reasoning

Investigation of the basis for elementary operations in concrete situations, diagrams, and symbolic representation. Understanding of, and problem-solving in, the following areas: numerical operations, ratios and percents, linear and exponential growth in situations, formulas, and graphs; rate of change; mensurational geometry; units, dimension, and scaling.

Credits: 4. Contact Hours: 4 hr./wk.

MATH 18500 - Basic Ideas in Mathematics

Problem solving, sets, operations with sets, functions, numerical systems with different bases, topics in number theory, probability and geometry. Includes writing exercises and collaborative work. This course is for potential education majors only.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 18000 or placement by the department.

MATH 18504 - Basic Ideas in Mathematics

Sets, operations with sets, relations, functions, construction of numerical systems, numerical systems with different bases, topics in number theory, geometry. Required for Early Childhood Education majors.

Credits: 4. Contact Hours: 4

MATH 19000 - College Algebra and Trigonometry

Introduction to functions, rational expressions and their applications, rational exponents, conic sections, Gaussian elimination and determinants, nonlinear systems of equations, introductions to trigonometric functions.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: Placement at college entry or by subsequent examination.

MATH 19500 - Precalculus

Intervals, inequalities, operations on functions, inverse functions, graphing polynomial functions, exponential and logarithmic functions, trigonometric functions and formulas.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 19000 or placement by the department.

MATH 20100 - Calculus I

Limits, derivatives, rules of differentiation, trigonometric functions and their derivatives, differentials, graph sketching, maximum and minimum problems, related rates, conic sections, introduction to vectors.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 19500 or placement by the Department. Credit will be given for only one of the following courses: MATH 20100 (part of sequence MATH 20100, MATH 20200, MATH 20300) or MATH 20500.

MATH 20200 - Calculus II

Introduction to integration and areas; application to solids of revolution and work; definition of exponential and logarithmic functions; integration of trigonometric, exponential and logarithmic functions, analytical and numerical methods of integration, improper and infinite integrals, polar coordinates; parametric representation of curves.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 20100 or placement by the Department. After completion of MATH 20900, only 3 credits will be given for MATH 20200. (Part of sequence MATH 20100, MATH 20200, MATH 20300.)

MATH 20300 - Calculus III

Vectors, infinite series, Taylor's theorem, solid analytic geometry, partial derivatives, multiple integrals with applications. Interpretations and calculations using *Matlab* software.

Credits: 4. Contact Hours: 4 lect., 1 lab hr./wk. Prerequisite: A grade of C or higher in MATH 20200 or placement by the Department.

MATH 20500 - Elements of Calculus

Limits, derivatives, rules of differentiation, differentials, graph sketching, maximum and minimum problems, related rates, exponential and logarithmic functions, differential equations, anti-derivatives, area, volume, applications to economics.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 19500 or placement by the Department. Credit will be given for only one of the following courses: MATH 20100 or MATH 20500. (Recommended for Architecture and Economics majors.)

MATH 20900 - Elements of Calculus and Statistics

Introduction to differential equations including numerical methods; qualitative analysis of solutions; phase plane analysis for systems; biological applications; analysis of univariate and bivariate data; regression and correlation; random variables; the normal, Poisson and binomial distributions; statistical inference. A spreadsheet program such as *Excel* is used throughout the course.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 20500 or placement by the Department. (Part of sequence MATH 20500, MATH 20900 for Biology majors.)

MATH 30100-30400 - Honors I-IV

Credits: Credit flexible. Contact Hours: Credit flexible but usually 3 credits per term. Prerequisite: Approval of Department Honors Advisor required.

MATH 30800 - Bridge to Advanced Mathematics

This course explores the logical and foundational structures of mathematics, with an emphasis on understanding and writing proofs. Topics include set theory, logic, mathematical induction, relations and orders, functions, Cantor's theory of countability, and development of the real number system.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: A grade of C or higher in MATH 20300 or placement by the Department.

MATH 31000 - Independent Study

A program of independent study under the direction of a member of the Department with the approval of the Assistant Chair.

Credits: 1-4. Contact Hours: Credit may be from 1-4 credits, as determined before registration by the instructor with the approval of the Assistant Chair.

MATH 31001 - Independent Study

Independent Study. This course can be repeated at most 3 times for a maximum of 3 credits total.

Credits: 1. Contact Hours: 1 hr./wk.

MATH 31002 - Independent Study

Independent Study. This course can be repeated at most 3 times for a maximum of 6 credits total.

Credits: 2. Contact Hours: 2 hr./wk.

MATH 31003 - Independent Study

Independent Study. This course can be repeated at most 3 times for a maximum of 9 credits total.

Credits: 3. Contact Hours: 3 hr./wk.

MATH 31004 - Independent Study

Independent Study. This course can be repeated at most 3 times for a maximum of 12 credits total.

Credits: 4. Contact Hours: 4 hr./wk.

MATH 31100-32000 - Selected Topics in Mathematics

Topics in mathematics. This course can be repeated at most 3 times for a maximum of 9 credits total.

Credits: Credits and hours will be determined by the instructor and the department, with a maximum of 4 credits per course.. Prerequisite: Departmental consent required.

MATH 32300 - Advanced Calculus I

Sequences, properties of continuous functions, derivatives and differentials, functions defined by series, integrability and integrals, convergence of function sequences.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: Grade of C or higher in MATH 30800 or placement by the Departmental.

MATH 32404 - Advanced Calculus II

Sequences, continuity, compactness, completeness, differentiation and integration in \mathbf{R}^n , implicit and inverse function theorems, line and surface integrals, theorems of Green, Gauss and Stokes.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: Grades of C or higher in MATH 32300 and MATH 34600 or placement by the Department. (Part of sequence MATH 32300, MATH 32404.)

MATH 32800 - Methods of Numerical Analysis

Solution of equations by iteration techniques; Lagrange and Newton interpolation, Neville's method, divided differences, cubic splines; numerical integration, Romberg integration; systems of linear equations and pivoting techniques; Runge-Kutta methods for initial value problems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: A grade of C or higher in MATH 34600, or MATH 39200, or placement by the Department and knowledge of Matlab or other high level programming language. Pre/Coreq.: MATH 39100.

MATH 34200 - History of Mathematics

Historical development of mathematical ideas and methods in geometry, theory of numbers, algebra, and analysis.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Grade of C or higher in MATH 30800.

MATH 34500 - Theory of Numbers

Divisibility, primes, fundamental theorem of arithmetic, congruences, number theory from an algebraic viewpoint, quadratic reciprocity, number theoretic functions, diophantine equations.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: A grade of C or higher in MATH 30800 or placement by the Department.

MATH 34600 - Elements of Linear Algebra

Vector spaces, basis and dimension, matrices, linear transformations, determinants, solution of systems of linear equations, eigenvalues, and eigenvectors.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Grade of C or higher in MATH 20300 or placement by the department. (After completion of MATH 39200 only 2 credits will be given for MATH 34600).

MATH 34700 - Elements of Modern Algebra

Sets, mappings, rings, isomorphisms, integral domains, properties of integers, fields, rational numbers, complex numbers, polynomials, groups.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: Grades of C or higher in MATH 30800 and MATH 34600 or placement by the Department. Partial credit may be given for MATH 44900 after completion of MATH 34700. Recommended for prospective teachers and others who want a basic course in abstract algebra.

MATH 36000 - Introduction to Modern Geometry

Logical deficiencies in Euclidean geometry, Euclid's parallel postulate, introduction to non-Euclidean geometry, the logical consistency of the non-Euclidean geometries, Hilbert's Axioms.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: A grade of C or higher in MATH 30800 or placement by the Department.

MATH 36500 - Elements of Combinatorics

The three problems of combinatorics (existence, counting, optimization), basic counting rules, graph theory, generating functions, principles of inclusion and exclusion, pigeonhole principle, selected additional topics.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 20300 or placement by the Department.

MATH 36600 - Introduction to Applied Mathematical Computation

Calculus, linear algebra, elements and applications of probability theory are examined through use of Matlab. Topics selected from symbolic and numerical problems in analysis; matrices, linear mappings, eigenvalues and applications; queueing theory; random numbers and simulations; graphics.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: A grade of C or higher in MATH 34600 or placement by the Department.

MATH 37500 - Elements of Probability Theory

Permutations and combinations, conditional probability, independent events, random variables, probability distributions and densities, expectation, moments, moment generating functions, functions of random variables, Central Limit Theorem, sampling, confidence intervals.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 20300 or placement by the Department.

MATH 37600 - Mathematical Statistics

The gamma, chi-square, T, F, and bivariate normal distributions; Central Limit Theorem; confidence intervals and tests of hypothesis; the Neyman-Pearson Theorem; likelihood ratio test; estimation; sufficiency, unbiasedness, completeness; the Rao-Blackwell Theorem; the Rao-Cramer inequality; the method of maximum likelihood; the chi-square test; introduction to the analysis of variance and regression.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 37500 or placement by the Department.

MATH 37700 - Applied Statistics and Probability

Introduction to *SPSS*; Introduction to *Matlab*; modeling and construction of random variables; study of Z, chi-square, t , and F distributions; study of order statistics; determination of p-values; understanding of hypothesis testing and confidence intervals; organization of data; various descriptive statistics such as measures of variability and location; categorical variables; sampling distributions with *SPSS*; statistical inference, linear regression models; regression analysis; analysis of variance; the jackknife methodology of computer based estimation, discriminant analysis, factor analysis, cluster analysis.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: or Coreq.: Grade of C or higher in MATH 37600.

MATH 38100 - Discrete Models of Financial Mathematics

Definitions of options and exotic options on stocks, interests rates and indices; binomial trees; volatility and methods to estimate volatility; continuous models and Black-Scholes; hedging; bond models and interest rate options; spreadsheet methods and computational methods including difference methods and Monte Carlo simulations.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: A grade of C or higher in MATH 20200 or placement by the Department.

MATH 38200 - Continuous Time Models in Financial Mathematics

Review of discrete time models and binomial trees. Cox, Ross, Rubinstein approach to the Black-Scholes model; Black-Scholes equation and option pricing formulae; Brownian motion and stochastic differential equations; Ito's calculus and Ito's lemma; stopping times; the heat equation; option pricing and the heat equation; numerical solution of parabolic partial differential equations; interest rate models; simulation and financial models.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: A grade of C or higher in MATH 38100 or placement by the Department.

MATH 39100 - Methods of Differential Equations

First order equations; higher order linear equations with constant coefficients, undetermined coefficients, variation of parameters, applications; Euler's equation, series solutions, special functions; linear systems; elementary partial differential equations and separation of variables; Fourier series.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: A grade of C or higher in MATH 20300 or placement by the Department.

MATH 39104 - Methods of Differential Equati

MATH 39104 is a 4-credit enhanced version of MATH 39100 with additional topics of interest to science and engineering majors. The enhanced curriculum was recommended by the physics department and endorsed by many other departments. The course satisfies any MATH 39100 requirement and covers some additional material.

Credits: 4. Contact Hours: 4 hours

MATH 39200 - Linear Algebra and Vector Analysis for Engineers

Matrix theory, linear equations, Gauss elimination, determinants, eigenvalue problems and first order systems of ordinary differential equations, vector field theory, theorems of Green, Stokes, and Gauss.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: A grade of C or higher in MATH 20300 or placement by the Department. No specialization

credit will be given for both MATH 32404 and MATH 39200. (After completion of MATH 34600 only 2 credits will be given for MATH 39200.)

MATH 39300 - Laplace and Fourier Transforms for Scientists and Engineers

Fourier series, the Fourier transform, discrete fourier analysis, wavelet analysis, multiresolution analysis, computer applications using *Matlab*.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 39100 or placement by the Department.

MATH 39500 - Complex Variables for Scientists and Engineers

Algebra and geometry of complex numbers; elementary transcendental and algebraic functions and their conformal mappings; Cauchy-Riemann equations, contour integrals, Cauchy integral formula, analyticity and power series, the residue theorem and applications.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 39100 or placement by the Department. After completion of MATH 43200, only 2 credits will be given for MATH 39500.

MATH 43200 - Theory of Functions of a Complex Variable I

Cauchy-Riemann equations, conformal mapping, elementary, entire, meromorphic, multiple-valued functions, Cauchy integral theorems, series expansion.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 32404 or placement by the Department.

MATH 43400 - Theory of Functions of a Real Variable I

Lebesgue measure and integration on the real line, differentiation of real functions and the relation with integration, classical L_p spaces.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 32300 or permission of the instructor.

MATH 43500 - Partial Differential Equations I

First order equations, shock waves; classification and canonical forms of higher order equations, characteristics, the Cauchy problem for the wave equation: Huygens' principle; the heat equation; Laplace's equation; the Dirichlet and Neuman problems; harmonic functions; eigenvalue expansions; Green's functions.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: Grades of C or higher in MATH 32404 and MATH 39100 or placement by the Department.

MATH 44300 - Set Theory

Axioms of Zermelo-Fraenkel set theory; relations, functions, equivalences and orderings; cardinal numbers and cardinal arithmetic; well-ordered sets; ordinal numbers, transfinite induction and recursion; the Axiom of Choice and the Continuum Hypothesis.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 32300 or permission of the instructor.

MATH 44400 - Mathematical Logic

The propositional calculus, the sentential calculus, normal forms, first order theories, consistency, categoricity, decidability, Godel's incompleteness theorem, the Loewenheim-Skolem theorem.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 32300 or permission of the instructor.

MATH 44900 - Modern Algebra I

Groups, rings, fields.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 32300 and MATH 34600 or placement by the Department. Partial credit may be given for MATH 44900 after completion of MATH 34700.

MATH 46100 - Differential Geometry

The theory of curves and surfaces in three-dimensional space: frames, fundamental forms, geodesics; curvature of surfaces; surface area; surfaces with boundary, the Gauss-Bonnet Theorem; introduction to Riemannian metrics.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: Grade of C or higher in MATH 32404.

MATH 46300 - Topology I

A course in general topology. Sets of points on the real line and in general abstract spaces, relations between sets of points and between a set and the space containing it, operations with sets, open sets, countability, compactness, connectedness, maps, continuity, metric spaces, general topological spaces.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 32404 or placement by the Department.

MATH 46700 - Mathematical Modeling

Problems from industry, mathematical models, process of mathematical abstraction, problem-solving techniques, application of solutions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Grades of C or higher in MATH 34600, MATH 36600, MATH 37500, and MATH 39100 or placement by the Department.

MATH 47700 - Stochastic Processes I

Special topics in probability such as stochastic processes, Markov chains.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 34600, and MATH 37500 or placement by the Department. Pre/Coreq.: MATH 32404.

MATH 47800 - Advanced Mathematical Statistics

The multivariate normal distribution, multiple and partial correlation, regression and least squares, the analysis of variance.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: A grade of C or higher in MATH 34600 and MATH 37600 or placement by the Department.

MATH 51100 - Selected Topics in Pure Mathematics

Topics to be chosen from the areas of algebra, analysis, topology, geometry, and logic. This course can be repeated at most 3 times for a maximum of 12 credits total.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: Departmental consent.

MATH 51200 - Selected Topics in Classical Analysis

Topics to be chosen from applied mathematics and related fields. Typical subjects are: asymptotic methods, wave propagation, mathematical biology. This course can be repeated at most 3 times for a maximum of 12 credits total.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: DEPT CONSENT

MATH 51300 - Selected Topics in Probability, Statistics, and Operations Research

Topics to be chosen from the areas of probability, statistics, game theory, combinatorial analysis, etc. This course can be repeated at most 3 times for a maximum of 12 credits total.

Credits: 4. Contact Hours: 3 hr./wk. Prerequisite: Departmental consent.

MCA - Media and Communications Arts Course Descriptions

MCA 10100 - Introduction to Media Studies

This survey course will introduce students to technological, historical, economic and social perspectives on the communications field. Particular emphasis will be placed on research, critical analysis, effective

writing and dynamic presentation skills essential for success in the highly competitive communication industries. Open to all students in good academic standing. (Required for all Advertising/PR and Film/Video majors; open to other students as an elective. This class replaces MCA 20200 as a pre-requisite for applying to the BFA program in Film/Video.)

Credits: 3. Contact Hours: 3 hr./wk.

MCA 10500 - Introduction to Media Production

This course introduces the fundamental elements of video production and is the "gateway" into the B.F.A. program. Projects produced in this course are used to evaluate a student's candidacy into the program. Using digital video cameras, students learn basic organizational, writing, camera, and editing skills through short group and individual exercises and projects. Visual storytelling and narrative structure in fictional and non-fictional forms are emphasized.

Credits: 3. Materials Fee: \$20. Contact Hours: 3 hr./wk. Prerequisite: ENGL 11000 or FIQWS.

MCA 12100 - Introduction to Film Studies

This course examines the artistic and social power of film as a medium of audiovisual communication. The course emphasizes the analysis of narrative feature films, but also examines non-fiction and experimental forms. The course offers a systematic view of how cinema tells stories, organizes information, patterns, light and sound, and creates unique aesthetic and social experiences. Aspects treated by the course include sound, editing, cinematography, film style, narrative and non-narrative forms, the organization of film production, and the relations of film to broader artistic, social, and historical contexts. Attention is given to the ways film is now related to television, video, and new computer technologies.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: ENGL 11000 or FIQWS.

MCA 20000 - Introduction to Film Production

This course introduces the student to the fundamentals of film production and builds on previously learned production skills in MCA 10500. Students learn how to use a 16mm film camera, the light meter and gain practical experience with B&W film stock and exposure control.

Credits: 3. Materials Fee: \$50. Contact Hours: 3 hr./wk. Corequisite: MCA 20500.

MCA 20500 - Editing

This course examines the theoretical aspects and the practical techniques of editing picture and sound. Narrative structure, storytelling strategies, and problem solving are explored. Using "Final Cut Pro" software, students will learn basic computer editing, media management, and organizational skills needed in post-production.

Credits: 3. Materials Fee: \$50. Contact Hours: 3 hr./wk. Corequisite: MCA 20000.

MCA 20900 - Introduction to Public Relations

This course introduces students to the fundamental concepts and theories behind persuasive communications and the application to public relations. Public opinion, audience research, media relations and tools for effective communications using the Internet and traditional methods are also explored. Students develop and present a public relations proposal, incorporating research, objectives, strategy and tactics and evaluation techniques as a culmination to the course.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 10100. Open only to Ad/PR majors or by permission of the instructor.

MCA 21000 - Introduction to Advertising

This class provides an introduction to the advertising industry. Students analyze campaigns from a marketing viewpoint and evaluate placement and effectiveness of visual and written advertisements. Advertising strategies and campaign development are introduced.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 10100. Open only to Ad/PR majors or by permission of the instructor.

MCA 21100 - Advertising and Public Relations Production

In this course, students learn the art and science of preparing typography, graphic design, illustration and photography for printed documents used in the advertising and public relations professions. This is an essential skill for entry-level positions in this communications specialization. Students work on personal computers to learn the basic applications of electronic layout and design as a means of creating a cohesive visual message for an organization or business through documents and advertisements.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Corequisite: MCA 21000.

MCA 21500 - Sound Production & Design

This course introduces the technology, equipment and skills necessary for the acquisition of sound in film and video productions. In addition, the course will explore the theory and role of sound design in both fiction and non-fiction productions. Particular attention will be given to sound production and design as it relates to the films and videos that the student will make in the program.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 20000, MCA 20500 Corequisite: MCA 23200.

MCA 22100 - History and Theory of Film I

A chronological survey of the history and theory of cinema from its origins to World War II. Topics include the work of major directors, aesthetic theories, movements, technical innovations, methods of production and distribution, the influences on cinema from the other arts and contemporary ideologies.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MCA 12100, ENGL 21000 or MCA 20200.

MCA 22200 - History and Theory of Film II

A chronological survey of the history and theory of cinema from World War II to present. Topics include the work of major directors, aesthetic theories, movements, technical innovations, methods of production and distribution, the influences on cinema from the other arts and contemporary ideologies.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MCA 12100, MCA 22100.

MCA 23200 - Documentary Workshop I

This course is an introduction to documentary filmmaking and covers the various stages of non-fiction storytelling including research, script development/treatment, pre-production planning, production and post-production editing. The course will also examine work that falls outside of the traditional documentary form, including work that incorporates significant non-fictional components. Students develop, shoot and edit short documentary exercises and learn basic interview techniques, lighting, and sound recording techniques.

Credits: 4. Materials Fee: \$50. Contact Hours: 4 hr./wk. Prerequisite: MCA 10500, MCA 12100, MCA 20000, MCA 20500 Corequisite: MCA 21500.

MCA 23300 - Introduction to Journalism

This course introduces students to the basics of reporting and writing for the print and web-based media. A hands-on course, students learn the rigors of journalism through covering stories. Guest speakers from newsrooms across the city regularly address the class.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGL 11000 Corequisite: MCA 10100 or permission from the instructor.

MCA 29900 - Internship in Communications I

Introductory supervised experience. Assignment in entry-level position of employment.

Credits: 1-6. Prerequisite: Permission of the Department and acceptance into Internship Program.

MCA 30100 - Critical Approaches to Independent Documentary

This course covers the history theory and practice of the independent documentary, particularly as it has evolved since the digital revolution. The course investigates how the work of documentary media makers are contributing to a redefinition of a world culture that incorporates a broader spectrum of voices and experiences. Focus is also given to documentary pioneers and the antecedents of filmed documentary including the paintings of Brueghel, the observational writing of Mayhew and the editorial photography of Riis.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MCA 22200, MCA 23200, MCA 32300, MCA 32100. Corequisite: MCA 32500, MCA 42400, MCA 43200.

MCA 31001-31003 - Independent Study

Open to advanced students only, with permission of the Department.

Credits: 1-3.

MCA 31013 - Supervised Radio Station Study

In this small-group study at WHCR Harlem Community Radio, students use reporting, recording, and editing skills to come up with ideas and produce broadcast quality stories. The hands-on course accepts a limited number of students (1-5) who work closely with the general manager of WHCR and other trained staff..

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 34100.

MCA 31100-32000 - Selected Topics

Advanced study in selected topics in the areas of film and video, advertising and public relations and journalism with emphasis upon aspects not treated in regular courses.

Credits: Hours and credits to be arranged..

MCA 32100 - Motion Picture Production Workshop I

Building on the student's basic knowledge of film, exposure, cameras, and cinematic language, this production course emphasizes visual storytelling and control of the motion picture frame. Visual strategies, technical, and aesthetic application of lighting in support of the narrative are emphasized. In addition, basic organizational elements needed in pre-production for students to produce, direct, and shoot their films are developed.

Credits: 3. Materials Fee: \$50. Contact Hours: 3 hr./wk. Prerequisite: MCA 20000, MCA 20500, MCA 21500. Corequisite: MCA 23200, MCA 32300.

MCA 32300 - Screenwriting Workshop

This course examines the fundamental principles and forms of narrative storytelling and their expression through the screenplay format. Emphasis is placed on the elements that create drama and conflict, and particular attention will be given to visual storytelling. The course will also examine the similarities and differences between the short and long narrative forms and compare various storytelling models and strategies. Extensive outside writing assignments and rewrites are required for this course.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 23200, MCA 32100 and MCA 32300. Corequisite: MCA 32500., MCA 43200.

MCA 32500 - Directing for Film and Video

This course explores the aesthetics, basic principles and skills needed to direct film and video productions. Through various exercises and analysis, students learn how to work with actors and the use of different techniques and strategies to elicit performances. Pre-production responsibilities, scene analysis, blocking, and shot breakdowns are also covered.

Credits: 3. Materials Fee: \$20. Contact Hours: 3 hr./wk. Prerequisite: MCA 20000, MCA 20500, MCA 21500, MCA 23200. Corequisite: MCA 32100, MCA 42400.

MCA 33300 - Reporting and Writing

Instruction and practice in the basic techniques of reporting, including, interviewing and public affairs research, and writing news for mass audiences. It includes discussions on libel, freedom of information, fairness, and balance. Assignments involve real people and events.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 23300 or permission of the instructor.

MCA 34100 - Radio Journalism

This is a basic course in radio reporting and production. Students learn to write for the ear and incorporate the creative uses of sound in telling a news story. Production techniques are an integral part of the course. Students receive actual on-air experience in the news department of WHCR, the college's community radio station.

Credits: 3. Materials Fee: \$40. Contact Hours: 3 hr./wk. Prerequisite: MCA 23300 or permission of the instructor.

MCA 34300 - Television Journalism

Instruction in reporting, writing, and production for television news and features. Students receive a survey of the history and current state of TV news and learn to adapt their reporting and writing skills to the medium of television. They practice using visuals to convey a news story to the viewer, learn electronic news gathering through field work and are introduced to the basics of newscast and editing.

Credits: 3. Materials Fee: \$40. Contact Hours: 3 hr./wk. Prerequisite: MCA 33300 or with permission of program director.

MCA 35000 - Corporate Communications

This class familiarizes students with planning and implementing communications strategies for corporations and institutions. Through case studies, students examine communications issues for internal and external audiences, and learn how to conduct research, set objectives and effectively communicate through a variety of tactics. Topics include creating brand value through public relations, integrated marketing communications, media relations, and crisis communications.

Credits: 3. Contact Hours: 3 hrs./wk. Prerequisite: ENGL 11000, MCA 20900.

MCA 36000 - Marketing Research

This course examines how to identify the necessary information to satisfy customers' needs and interests and make the marketing plan work. Students examine the role of marketing research in the advertising or public relations firm, different research designs, data collection procedures, sampling issues, data analysis techniques and how to write a research report.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 20900 and MCA 21000.

MCA 36200 - Public Relations Writing

Students learn how to create persuasive messages and effectively communicate them to audiences through a variety of written and spoken tactics. Communicating with the media through press releases, media kits, press conferences, features, backgrounders, photo captions, video news releases and PSA's are explored. In addition, students learn the fundamentals of good business writing for memos, letters, direct mail, brochures, proposals and oral presentations. Internet and web public relations are covered.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: MCA 20900 or permission of the instructor.

MCA 36300 - Advertising Copywriting

In this course, students learn how to generate ideas that help solve marketing problems and to execute those ideas through copywriting.

The class will write, edit and evaluate advertising copy, including print, radio, television, direct mail and promotional materials. Students work individually and in teams on assignments that involve both word and image.

Credits: 4. Materials Fee: \$40. Contact Hours: 4 hrs./wk. Prerequisite: MCA 21000 and MCA 37500.

MCA 36400 - Advertising and Public Relations Portfolio Production

A continuation of MCA 21100. Students learn advanced skills and uses of graphic software programs to create business and promotional presentations. The focus of this course is to provide students with the skills necessary to create an entry-level portfolio according to industry standards. Students produce graphic presentations of graphs charts, brochures, ad campaigns, proposals and other forms of printed communications.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 21100.

MCA 36500 - Social Media Strategies

This class explores the role of social media and related applications to the shifting public relations landscape to digital communications. Topics include social media trends, emerging digital technologies, online PR tools, case studies, and social media applications.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 20900 and MCA 21000.

MCA 36700 - Entrepreneurship for Media Studies

This course familiarizes students with media-related entrepreneurship using time-tested business and brand building techniques and communications technologies that expand market share and global awareness of products or expertise. Using case studies, the course helps students develop a personal and professional global positioning system (GPS) to become an independent business owner in a media related field. Field trips to the NYC Department of Small Business Services (NYC Solutions) and New York Public Library's Science, Industry and Business Library (SIBL), help students refine their research and business development expertise.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Completed at least 30 credits.

MCA 36800 - Media Planning

This course provides a detailed introduction to media planning and buying. Students examine media placements from a theoretical perspective and through applied connections to social sciences, such as sociology, anthropology and economics. Students learn how to research, analyze and determine appropriate media outlets for designated target audiences, and how to create a media plan from start to finish for final presentation.

Credits: 3. Contact Hours: 3 hours

MCA 37400 - Event Planning

This course prepares students to plan effective meetings and events requiring detailed preparation and coordination. Appropriate communication and organizational skills will be utilized. From establishing goals to putting together budgets and scheduling media coverage, students learn the techniques and skills necessary for successful special event execution. Veteran event planners share their real-world knowledge and expertise. As a final project, students create and plan a hypothetical event from start to finish.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 20900.

MCA 37500 - Advertising Management I

An introduction to the basic management principles of the advertising business. Readings and discussions on the economic, social and legal aspects of the industry with an emphasis on advertising's role in a marketing plan, consumer behavior, market segmentation, and position strategy.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 21000.

MCA 37600 - Advertising Planning

Application of advertising management principles to specific problems and case studies. Focus is on developing advertising strategies, budgets and media plans. Attention will be given to national and international marketing environments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 37500.

MCA 39501-31003 - Group Independent Study

A cooperative project, assigned to more than one student. Open to advanced students only, with permission of the instructor.

Credits: 1-3.

MCA 39900 - Internship in Communications II

A more advanced supervised assignment.

Credits: 1-6. Prerequisite: Permission of the Department and successful completion of MCA 29900.

MCA 40100 - Ethics and Values in Communication

A senior seminar in the moral issues of communications, professional ethics. Materials are presented through films, literature, and readings in philosophy and social commentary, directed discussions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 20900 and MCA 21000 or permission of the instructor.

MCA 40200 - Critical Approaches to Film Directors

Studies of major filmmakers from American & world cinema such as Griffith, Eisenstein, Ford, Kurosawa, Buñuel, Fellini, Altman, Sembene, and Varda. Emphasis is given to detailed analysis of films within their cultural, historical, and industrial contexts.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MCA 22100, MCA 22200, MCA 30100 or permission of instructor.

MCA 40300 - The Documentary in Film & Television

An investigation of the theory and practice of documentary in its diverse forms as film, television, video, and digital media. Screenings of historically important works are analyzed in light of different theories about documentary practice.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MCA 22100, MCA 22200, MCA 30100 or permission of instructor.

MCA 40400 - Studies in Film History and Aesthetics

Studies of specialized topics in film history and aesthetics. Topics change from year to year. Previous topics have included *Film Noir*, *Women & Film*, *New Asian Cinemas*, and *Cinemas of the African Diaspora*.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MCA 22100, MCA 22000, MCA 30100 or permission of instructor.

MCA 42200 - Motion Picture Production Workshop II

This course is one of the two production courses that students may choose to shoot their thesis project in. Building on all previous production courses in the program, it is a course for students who wish to further their mastery of filmmaking in 16mm film or digital video. Students will refine and apply their knowledge of visual storytelling, pre-production, lighting, and sync-sound production through class exercises and group projects. Projects produced in this course are edited in MCA 32600.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: MCA 30100 MCA 32500, MCA 42400, MCA 43200 Corequisite: MCA 29900, MCA 39900, MCA 40300, MCA 40400, MCA 42600.

MCA 42400 - Senior Writing Workshop

Building on the knowledge and skills learned in Screenwriting I and Documentary Workshop I, students refine their writing skills in fiction and documentary. This course offers the opportunity for students to write a screenplay or a documentary proposal that will qualify as a thesis

writing project. Extensive outside writing assignments and rewrites are required for this course.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 23200 and MCA 32300 Corequisite: MCA 32100.

MCA 42600 - Digital Post Production

This course covers advanced topics in digital editing, motion graphics, filters and sound design using Final Cut Pro editing software. In addition to class exercises, students edit material produced in their MCA 42200 or MCA 43200 courses.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MCA 32100, MCA 32500 MCA 43200; pre or coreq.: MCA 42200 or MCA 42200 or MCA 40200 MCA 40400, or MCA 29900

MCA 43200 - Documentary Workshop II

This course is one of the two production courses that students may choose to shoot their thesis project in. Building on all previous production courses in the program, it is a course for students who wish to further their mastery of documentary filmmaking and the non-fiction form. Students develop, shoot, and edit documentaries that are more in-depth and complex, and explore alternative aesthetic approaches to non-fiction storytelling. Projects produced in this course are edited in MCA 42600.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: MCA 22200, MCA 23200, MCA 32100, MCA 32300, MCA 42600 Corequisite: MCA 30100, MCA 32500, MCA 42400

MCA 46800 - Advertising and Public Relations Workshop

This senior course is the capstone for the advertising/public relations program. Students work individually and in teams to complete a campaign for a client from research through execution. Professional presentation skills are emphasized throughout. The course culminates in a project portfolio. Students must receive approval of the instructor.

Credits: 4. Materials Fee: \$40. Contact Hours: 4 hr./wk Prerequisite: MCA 35000, MCA 36200, MCA 36300 and MCA 37600.

MCA 49900 - Internship in Communications III

Advanced supervised assignment.

Credits: 1-6. Prerequisite: Permission of the Department and successful completion of MCA 29900 and MCA 39900.

ME - Mechanical Engineering Course Descriptions

ME 14500 - Computer-Aided Drafting

Basic theory of space geometry, with applications in computerized drafting. Students develop skills of spatial analysis, visualization and interpretation through reading existing drawings and freehand sketching. Conventional drafting practices are introduced, including orthographic projections, auxiliary and sectional views, isometric and orthographic projections and basic dimensioning. Computer-aided drafting software is used to produce engineering drawings.

Credits: 2. Contact Hours: 1 class, 2 lab hr./wk.

ME 24600 - Engineering Mechanics I (Statics and Particle Kinematics)

Vector concepts in mechanics. Equivalent force systems. Centers of gravity and pressure. Equations of equilibrium for two- and three-dimensional systems. Static determinacy. Analysis of trusses, frames, machines and cables. Frictional forces. Properties of surfaces and rigid bodies. Particle kinematics: path variables, cylindrical coordinates and relative motion. Recitation periods integrated with classroom work.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MATH 20200 (min. C grade), PHYS 20700 (min. C grade); pre- or coreq.: ME 14500 or BME 22000.

ME 24700 - Engineering Mechanics II (Kinematics and Dynamics of Rigid Bodies)

Kinematics of rigid bodies and relative motion. Particle dynamics. Vibrations of single-degree-of-freedom mass-spring systems. Dynamics of systems of particles and rigid bodies. Moment of momentum equations. Kinetics of plane motion for rigid bodies. Energy methods. Computer-assisted mechanism dynamics design project. Design periods integrated with classroom work.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 24600; MATH 39100 (min. C grade). Corequisite: MATH 39100

ME 31100 - Fundamental of Mechatronics

Modern electric/electronic devices with applications in mechanical measurements are used as various sensors, such as strain gages, thermocouples, piezoelectric transducers, LVDT's, optoelectronic proximity sensors, etc. Static and dynamic characteristics of sensors and time-frequency responses of various measurement systems are studied. Concepts of filtering, amplification and signal conditioning are demonstrated through hands-on laboratory experiments. Engineering statistics and regression analysis are also introduced for analyzing measurement errors.

Credits: 3. Contact Hours: 2 class, 3 lab hr./wk. Prerequisite: ENGR 20400, MATH 39100 (min. C grade) ME 24700, ME 33000; pre- or coreq.: ENGL 21007, ME 32200, MATH 39200 .

ME 32200 - Computer Methods in Engineering

Digital procedures and numerical techniques necessary for the solution of many classes of mechanical engineering problems. Procedures for the analysis and processing of experimental data, for the solution of boundary and initial value problems, sets of linear equations and eigenvalue problems. Difference methods. Use of these techniques as essential to the design process, both in the solution of equations which do not have easily obtained closed form solutions and in the treatment of experimental data. Students will principally use the microcomputer laboratory and ancillary facilities.

Credits: 3. Contact Hours: 2 class, 3 lab hr./wk. Prerequisite: Or coreq.: MATH 39100 (min. C grade).

ME 33000 - Mechanics of Materials

Engineering analysis of deformable elastic and inelastic bodies subject to axial, torsional, flexural and shearing loads. Analysis of stress and strain. Stress/strain relations, strain energy and failure theories. Deformations and deflections due to mechanical and thermal loads. Statically determinate and indeterminate systems. Pressure vessels, combined loading, principal stresses, thermal stresses, joints and fittings. Stability, buckling and critical loads.

Credits: 3. Contact Hours: 3 class, 1 rec. hr./wk. Prerequisite: ME 24600, MATH 20300 (Min. C) Corequisite: MATH 20300 (Min. C)

ME 35600 - Fluid Mechanics

Basic concepts in fluid mechanics. Hydrostatics. Control volume formulation of the basic laws of conservation of mass and momentum. Differential analysis of fluid motion: continuity and Euler's equations. Bernoulli's equations. Dimensional analysis and similitude. Incompressible viscous pipe flow. Introduction to boundary layer theory. Drag and lift.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MATH 39100 (min. C grade), PHYS 20800 (min. C grade); pre- or coreq.: Math 39200.

ME 37100 - Computer-Aided Design

Introduction to the theory and methods of Computer-Aided Design (CAD) from a user's viewpoint. Design methodology. Simulation and modeling. Introduction to analysis programs based on finite element methods and postprocessing. Application of these concepts to specific engineering design projects. The student will have access to professional workstations with color graphics capability.

Credits: 3. Contact Hours: 2 class, 3 design hr./wk. Prerequisite: ME 14500, ME 32200, ME 33000; pre- or coreq.: MATH 39200.

ME 40100 - Review of Engineering Fundamentals

Review of science, mathematics and engineering concepts. Topics include engineering mathematics, chemistry, materials science, solid and fluid mechanics, thermodynamics, engineering economics and ethics, computer science and electrical circuits. The course concludes with a practice Fundamentals of Engineering (FE) exam.

Credits: 1. Contact Hours: 3 hr./wk. Prerequisite: Senior undergraduate or graduate standing.

ME 40200 - Project Management

Introduction to project management for engineering systems design. Process stages for the development and utilization of an engineered system. Basic project management concepts for initiating, planning and executing systems design and development projects. Use of project management software for project scheduling of tasks organized under a work breakdown structure, Gantt charts, resource workload charts, PERT charts and identification of critical path

Credits: 1. Contact Hours: 1 hr./wk.

ME 41100 - Systems Modeling, Analysis and Control

Model development with applications to mechanical engineering systems. First and higher order system responses. Laplace transform, transfer functions and block diagrams. Frequency response and vibration. Routh-Hurwitz stability and graphical methods such as root locus and Bode plot. Introduction to feedback control. Concepts of PID control, tuning and compensation. Hands-on and demonstrative experiments include static and dynamic rotor balancing, shake table testing of various degree-of-freedom systems, feedback controls of pneumatic, servo motor, fluid level and temperature control systems.

Credits: 4. Contact Hours: 3 class, 3 lab hr./wk. Prerequisite: ME 31100, ME 33000; pre- or coreq.: ME 35600.

ME 43000 - Thermal Systems Analysis and Design

Engineering application of thermodynamics to steam gas cycles, gas cycles, refrigeration, Maxwell relations and application. Chemical reactions and combustion processes. Phase equilibrium and chemical equilibrium. Flow through nozzles and blade processes.

Credits: 3. Contact Hours: 2 class, 2 design hr./wk. Prerequisite: ENGR 23000, ME 35600.

ME 43300 - Heat Transfer

Derivation of the energy equation. One-dimensional conduction and extended surfaces. Introduction to two-dimensional and transient conduction. Fundamentals of convection heat transfer. Solutions to laminar convection problems. Correlation equations for Nusselt number. Free convection. Heat exchanger theory. Introduction to radiation heat transfer. Design projects on heat transfer in thermal systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGR 23000; ME 35600 Corequisite: ME 35600

ME 43600 - Aero-Thermal-Fluids Laboratory

Experiments and demonstrations designed to illustrate concepts and verify theories in thermodynamics, fluid flow, and heat transfer. Experiments involve a wind tunnel, a refrigeration unit, a centrifugal pump-turbine unit, a pipe flow unit, a fin heat transfer device and a heat exchanger. Use of PC-based data acquisition systems.

Credits: 1. Contact Hours: 3 lab hr./wk. Prerequisite: ME 31100, ME 43000, ME 43300.

ME 44100 - Advanced Stress Analysis

Stress and strain. Principal axes. Hooke's Law. Constitutive equations for elastic materials. Formulation of plane stress and plane strain in Cartesian and polar coordinates. Theories of failure. Thick tubes, rotating disks, shrink fits. Thermal stresses in rings, tubes, and disks.

Loads, moments, and deflections in statically indeterminate systems. Castigliano's theorems and energy methods. Component design projects involving various failure theories.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 24700, ME 33000.

ME 46100 - Engineering Materials

Utilizing concepts of atomic theory, crystalline structures and a variety of microscopic observations, basic properties of engineering materials are studied. Processing techniques for control of the microstructure of the materials to improve their mechanical behavior are introduced. The materials include metals and alloys, ceramics and glass, as well as plastics and composites. The necessary tradeoffs between design alternatives and available manufacturing and processing methods are also considered.

Credits: 4. Contact Hours: 3 class, 3 lab hr./wk. Prerequisite: CHEM 10301 (Min C grade), ENGL 21007; pre- or coreq.: ME 33000.

ME 46200 - Manufacturing Processes and Materials

Relationship between product design and manufacturing. Influence of material properties. Capabilities and limitations of common methods of processing metallic and nonmetallic materials (casting, hot and cold working, joining, traditional and non-traditional machining). Introduction to computer-aided manufacturing, robotics and computer numerical control.

Credits: 3. Contact Hours: 2 class, 3 lab hr./wk. Prerequisite: ME 14500, ME 46100.

ME 46300 - Micro/Nano Technology: Mechanics, Materials, and Manufacturing

The aim of this course is to introduce students with diverse technical interests to the emerging area of micro and nano phenomena in science and engineering. Micro-Electrical Mechanical Systems (MEMS) and Nanotechnology continue to revolutionize research in the engineering and science communities requiring newcomers to familiarize themselves with these fundamental principles. This course will address synthesis and manufacturing techniques of micro/nano devices, relevant mechanics concepts (such as fracture and contact mechanics, elasticity), material property determination at small scales (e.g. size-scale strength effects), and engineering difficulties with manipulation and control of materials and phenomena on scales less than 1000 times the width of a human hair. The course will be centered upon a series of investigational exercises including microfluidics experiments, electro-mechanical testing of microdevices, transport and deposition of macromolecules (e.g. DNA, proteins), nanolithography, and manipulation of carbon nanotubes. Course material will also briefly discuss the evolution of select micro/nano innovations and their impact and applications in applied sciences, medicine, space development, policy, and the environment.

Credits: 3. Contact Hours: 2 class, 2 lab hr./wk. Prerequisite: ME 35600 or CHE 34100; pre- or coreq.: ME 46200.

ME 46600 - Dynamics and Control of Aerospace Vehicles

Static and dynamic stability criteria. Control considerations. Longitudinal control. Stability derivatives. Longitudinal and lateral stability analysis. Lateral and rolling control. Transient motion in response to control movement. Open loop control. Dynamics of steered bodies. Closed loop control. Automatic control. Design projects related to aircraft control.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 41100 or EE 37100 ; pre- or coreq.: 46200.

ME 46800 - Aircraft and Rocket Propulsion

Aerodynamic and thermodynamic design of airbreathing and rocket engines. Physical parameters used to characterize propulsion systems performance. Subsonic and supersonic gas dynamics and cycle analysis of ramjets, turbojets, turbofans and turboprops. Effect of after-burning and thrust vectoring. Design of inlets, diffusers, fans, compressors,

combustors, turbines and nozzles. Liquid and solid propellant rockets. Market and environmental considerations. Design project.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 43000.

ME 46900 - Spacecraft Systems and Spacecraft Design

Overall description of the basic mission considerations for aircraft design. Space environment, astrodynamics and atmospheric reentry. Attitude description. Configuration and structural design. Spacecraft subsystems are discussed with theoretical background and current engineering practice. Thermal control. Power. Navigation and guidance. Telecommunications. Tools to evaluate the overall impact on the various component subsystems and the integrated system leading to the final design selection. Design project.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 43000.

ME 47100 - Energy Systems Design

Design and analysis of cycles, components, and systems used in power generation and related industries. Power plant cycles and flow diagrams. Heat balance calculations. Turbines, steam generators. Economics of energy systems, capacity analysis, load curve analysis, scheduling. Use of computerized steam and gas tables and power plant simulation. Design projects on power plant cycles and associated equipment.

Credits: 3. Contact Hours: 2 class, 1 design hr./wk. Prerequisite: ME 43000, pre- or coreq.: ME 43300.

ME 47200 - Mechanical Systems Design

Introduction to design philosophy. Design of basic mechanical elements: screws, shafts, gears, bearings, springs, brakes, clutches, etc. Open-ended design projects dealing with the integration of these elements into subsystems such as drive trains, indexing devices, conveyors, etc. Emphasis is placed on computer use with commercial and student-generated software, as well as on report writing.

Credits: 3. Contact Hours: 2 class, 2 design hr./wk. Prerequisite: ME 24700, ME 33000; pre- or coreq.: ME 46100.

ME 47300 - Senior Design Project 1

In this two-semester capstone course, the student is required to find a professional design solution to an open-ended real life engineering problem. These projects are proposed and supervised, in conjunction with course leaders, by individual faculty members or industry. Special attention is paid to the use of computer-driven machine tools as well as to the observance of economic, safety, reliability, esthetic, and ethical constraints. In the first semester, concept design and analysis are carried out. A functional prototype is fabricated in the second semester. As applicable, a physical or computer model must be tested, in addition to writing an in-depth engineering report. Each student is required to make an oral presentation to the faculty.

Credits: 3. Contact Hours: 2 class, 3 design hr./wk. Prerequisite: ME 47200; pre- or coreq.: ME 37100, ME 41100, ME 43600, ME 43300, ME 46200.

ME 47400 - Senior Design Project 2

In this two-semester capstone course, the student is required to find a professional design solution to an open-ended real life engineering problem. These projects are proposed and supervised, in conjunction with course leaders, by individual faculty members or industry. Special attention is paid to the use of computer-driven machine tools as well as to the observance of economic, safety, reliability, esthetic, and ethical constraints. In the first semester, concept design and analysis are carried out. A functional prototype is fabricated in the second semester. As applicable, a physical or computer model must be tested, in addition to writing an in-depth engineering report. Each student is required to make an oral presentation to the faculty.

Credits: 3. Contact Hours: 2 class, 3 design hr./wk. Prerequisite: ME 411000, ME 47300.

ME 51100 - Advanced Mechatronics

Digital principles are studied and their applications in A/D and D/A converters, microcontrollers and programmable-logic controllers (PLCs) are demonstrated by controlling various electromechanical devices, such as relays, DC servos, and stepper motors. Principles of electric machines and selection of electric motors are also introduced. Hands-on laboratory experience, including team-design for measurement and control of various electromechanical devices, is particularly emphasized.

Credits: 3. Contact Hours: 2 class, 2 lab hr./wk. Prerequisite: ME 41100.

ME 56300 - Micro/Nano Technology: Mechanics, Materials, and Manufacturing

The aim of this course is to introduce students with diverse technical interests to the emerging area of micro and nano phenomena in science and engineering. Micro-Electrical Mechanical Systems (MEMS) and Nanotechnology continue to revolutionize research in the engineering and science communities requiring newcomers to familiarize themselves with these fundamental principles. This course will address synthesis and manufacturing techniques of micro/nano devices, relevant mechanics concepts (such as fracture and contact mechanics, elasticity), material property determination at small scales (e.g. size-scale strength effects), and engineering difficulties with manipulation and control of materials and phenomena on scales less than 1000 times the width of a human hair. The course will be centered upon a series of investigational exercises including microfluidics experiments, electro-mechanical testing of microdevices, transport and deposition of macromolecules (e.g. DNA, proteins), nanolithography, and manipulation of carbon nanotubes. Course material will also briefly discuss the evolution of select micro/nano innovations and their impact and applications in applied sciences, medicine, space development, policy, and the environment

Credits: 3. Contact Hours: 2 class, 2 lab hr./wk. Prerequisite: ME 35600 OR CHE 34100; ME 46200 Corequisite: ME 46200

ME 51400 - Rotorcraft Aerodynamics

Rotor in vertical or hover flight: Momentum theory, wake analysis, blade element theory. Unsteady flow effects. Rotor in forward flight. Rotor mechanisms. Performance. Trim, stability and control. Helicopter configurations.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 41100.

ME 51500 - Orbital Mechanics

The two-body problem. Lagrangian dynamics. Hamiltonian equations. Perturbations. Satellite orbits and ballistic trajectories. Effects of drag on satellite orbits. The general three-body problem. Coordinate systems and coordinate transformations. Computational methods. Design project.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 24700.

ME 52600 - Introduction to Finite Element Method

Formulation of element stiffness matrices and their assembly. Assumed displacement fields. Isoparametric elements and Gauss quadrature. Static condensation and equation solvers. Variational calculus and weighted residuals. Application to statics, dynamics, fluid mechanics and heat transfer.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 32200, ME 37100; pre- or coreq.: ME 43300.

ME 53600 - Sustainable Energy Conversion Systems

Contemporary energy conversion systems, energy resources and factors affecting the rate of global energy consumption. Comparison of conventional and renewable energy conversion systems, including limitations and efficiency of each, and the comparative impacts on the environment. Applications include steam, gas, wind, and hydro turbine energy systems, internal combustion engines, fuel cells, solar energy converters, tidal and wave energy converters.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGR 23000 and ME 35600.

ME 53700 - Turbomachinery Design

Aerodynamic and thermodynamic fundamentals applicable to turbomachinery. Analysis of gas and steam cycles. Advanced cycles. Configurations and types of turbomachinery. Turbine, compressor and ancillary equipment kinematics. Selection and operational problems. Design projects relating to gas turbines.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 35600, ME 43000.

ME 53800 - Automotive Safety Design and Injury Biomechanics

In this course, the state-of-the-art and new design changes in the automotive industry that are geared towards safety issues and injury prevention of occupants will be discussed. Specifically, the topics of the course are: vehicle body design; crashworthiness of the body; stability of vehicles; restraint systems and supplemental restraint systems such as seatbelts, pre-tensioners and airbags; crash sensors; seat and interior safety; occupant protection systems; codes and FMVSS standards; NHTSA standards and crash tests; simulation and accident reconstruction; biomechanics of occupant kinematics; brief anatomy; injury classification; and mechanisms of occupant injuries. The students are required to design and analyze a safety feature of a vehicle.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 31100, ME 37100, ME 47200.

ME 53900 - Vehicular Power Systems

Classification of cycles and engines. Thermodynamic analysis and design applications of air standard and real gas cycles. Combustion charts. Exhaust and intake processes, residual gas fraction. Combustion thermodynamics, chemical equilibrium, and engine emissions. Carburetion, throttling, and carburetor design. Volumetric efficiency and valve design. Design studies. Engine design.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 43000, ME 35600, ME 43300.

ME 54200 - Introduction to the Theory and Practice of Vibration

Differential equations and general solutions of damped, free, and forced single-degree-of-freedom systems. Numerical solutions. Multi-degree-of-freedom systems, principal modes. Semi-definite systems. Shock and vibration testing. Design project on vibration isolation of machinery.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 24700.

ME 54600 - Robotics and Automation

Robotics and relevant fields related to robot design and operation. Kinematic problems peculiar to robotic construction. Control considerations. Power sources. Sensory equipment and intelligence. Specifications used to evaluate robot performance. Economic considerations of robotized operations in various applications. Group technologies and flexible manufacturing systems.

Credits: 3. Contact Hours: 2 class, 3 lab hr./wk. Prerequisite: ME 24700; pre- or coreq.: ME 46200.

ME 54700 - Environmental Control

Design of environmental control systems for domestic, commercial, and industrial spaces. Heating, ventilating, air conditioning. Psychrometric chart processes. Design projects on buildings involving heat transmission in building structures, space heat loads, cooling loads, air conditioning systems, fans, ducts, and building air distribution.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 43000, ME 35600, ME 43300.

ME 54800 - Aerostructures

Flight-vehicle imposed loads. Analysis and design of typical members of semi-monocoque structures under tension, bending, torsion, and combined loading. Buckling of columns and plates. Analysis and design

of joints and fittings. Design projects involving structural members under various loading conditions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 32200, ME 35600, ME 46100.

ME 55500 - Structural Dynamics and Aeroelasticity

Basic analytical techniques of fixed and rotating wings interactions with flows. Unsteady aerodynamics and flutter. Fuselage vibrations. Methods for vibration control. Stability analysis. Mechanical and aeromechanical instabilities. Design project including the aeroelastic behavior of simple systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 41100, ME 46100.

ME 55600 - Advanced Fluid Mechanics

Equations of viscous flow. Exact Navier-Stokes solutions. Low Reynolds number flow, lubrication theory. Design project on film bearings. Boundary layer flows. Reynolds equations. Turbulent flow hypotheses. Potential flow. Pumps and blowers. Design project on piping systems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 32200, ME 35600.

ME 56700 - Special Topics in Aerospace Engineering

Topics chosen for their particular or current interest to undergraduate students.

Credits: 1-3. Contact Hours: Hours vary Prerequisite: Department approval.

ME 56800 - Special Projects in Aerospace Engineering

Students may earn elective credits by undertaking appropriate and sufficient comprehensive research and design projects under the guidance of a faculty member, and writing a Thesis report.

Credits: 1-3. Contact Hours: Hours vary Prerequisite: Department approval.

ME 57100 - Mechanism Design

Introduction to linkages, cams, and gearing. Design criteria. Displacement, velocity and acceleration analysis of planar linkages: graphical and computer methods. Mechanical advantage by instant centers and virtual work. Static and dynamic mechanism force analyses. Kinematic synthesis of planar linkages: graphical and analytical approaches. CAM design: basic considerations of follower displacement, velocity, acceleration, and pulse. CAM layout and manufacture. Kinematic mechanism design project.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ME 24700.

ME 57200 - Aerodynamic Design

Airfoil theories. Finite wings. Swept wings. Compressible flow, normal and oblique shock waves. Wings in compressible flow. Airfoil design. Wind tunnels.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: ENGR 23000, ME 35600.

ME 59001-59003 - Special Projects

Students may earn elective credits by undertaking appropriate and sufficiently comprehensive research and design projects under the guidance of a faculty member, and writing a thesis report.

Credits: 1-3. Contact Hours: Hours vary Prerequisite: Formal (written) commitment of a faculty member.

ME 59002 - Special Projects

Students may earn elective credits by undertaking appropriate and sufficiently comprehensive research and design projects under the guidance of a faculty member, and writing a thesis report.

Credits: 2. Contact Hours: 2 hr. Prerequisite: Formal (written) commitment of a faculty member.

ME 59003 - Special Projects

Students may earn elective credits by undertaking appropriate and sufficiently comprehensive research and design projects under the guidance of a faculty member, and writing a thesis report.

Credits: 3. Contact Hours: 3 hr. Prerequisite: Formal (written) commitment of a faculty member.

ME 59101 - Special Projects

Students may earn elective credits by undertaking appropriate and sufficiently comprehensive research and design projects under the guidance of a faculty member, and writing a thesis report.

Credits: 1. Contact Hours: 1 hr. Prerequisite: Formal (written) commitment of a faculty member.

ME 59102 - Special Projects

Students may earn elective credits by undertaking appropriate and sufficiently comprehensive research and design projects under the guidance of a faculty member, and writing a thesis report.

Credits: 2. Contact Hours: 2 hr. Prerequisite: Formal (written) commitment of a faculty member.

ME 59103 - Special Projects

Students may earn elective credits by undertaking appropriate and sufficiently comprehensive research and design projects under the guidance of a faculty member, and writing a thesis report.

Credits: 3. Contact Hours: 3 hr. Prerequisite: Formal (written) commitment of a faculty member.

ME 59101-59103 - Special Projects

Students may earn elective credits by undertaking appropriate and sufficiently comprehensive research and design projects under the guidance of a faculty member, and writing a thesis report.

Credits: 1-3. Contact Hours: Hours vary Prerequisite: Formal (written) commitment of a faculty member.

ME 59500 - Teaching/ Research Experiences for Undergraduates

This course provides undergraduate students with guided experiences in developing and assisting in the teaching of undergraduate laboratories, and performing laboratory research, in either case under direct faculty supervision. Evaluation is based on written documentation of the work.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Departmental approval.

ME 59803 - Special Topics in Mechanical Engineering

Topics chosen for their particular or current interest to undergraduate students.

Credits: 3. Contact Hours: 3 hr. Prerequisite: Departmental approval.

ME 59804 - Special Topics in Mechanical Engineering

Topics chosen for their particular or current interest to undergraduate students.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: Departmental approval.

ME 59901 - Product Development, Management and Marketing

Product development strategies from concept to marketing. Integration of engineering, design, manufacturing, marketing, management and finance. students work in teams on all aspects of an actual product. The course is taught in partnership with industry.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Permission of instructor.

ME 59903 - Special Topics in Mechanical Engineering

Topics chosen for their particular or current interest to undergraduate students.

Credits: 3. Contact Hours: 3 hr. Prerequisite: Departmental approval.

ME 59905 - Special Topics in Mechanical Engineering

Topics chosen for their particular or current interest to undergraduate students.

Credits: 3. Contact Hours: 3 hr. Prerequisite: Departmental approval.

MED - Biomedical Education Course Descriptions

MED 10000 - Int Drg Abuse Addctn

In this freshman undergraduate core course on drug abuse and addiction, the emphasis is to be on a broad acquaintance with the principles and systems involved in drug addiction and the mechanisms by which these issues may be ameliorated. The subject matter is sufficiently broad to elicit interest in undergraduate students, yet provides enough information, regarding the various major categories of abused substances, that a student interested in further pursuit of studies in this field will have a solid base upon which to build. This course will be particularly useful for students interested in physiological or clinical psychology and those considering careers such as medicine, law, education, public policy, law enforcement, social work, as well as to those who seek to learn about the impact of drug addiction on the individual and society. The course will define addiction and other terms used to describe drug abuse. It will address why individuals abuse drugs, consider the interactions between drug taking behavior of individuals with social and legal values of the community and the consequences of chemical dependency and treatment options. It will also explore the neurobiological and pharmacological basis for the actions of major drugs of abuse, animal models useful in understanding the basis of action of these drugs, and will address future directions in the field. The classes will be team-taught by a sociologist, an anthropologists and neuropharmacologists.

Credits: 3. Contact Hours: 3 hours

MED 10200 - Principles of General Chemistry

This is an intermediate course, which includes most of the topics covered in a traditional pre-med General Chemistry course but delves more deeply into concepts and principles that will appear in the students' medical career. These involve acid-base behavior, some aspects of thermodynamics, and selected properties of liquids, gases, and solutions among others. Many of the principles and concepts taught are applied to biological systems. Mathematical techniques needed to understand the principles of chemistry are integrated into the course and elementary physics concepts are reviewed.

Credits: 5. Contact Hours: 4 lect., 1 rec., 3 lab hr./wk.

MED 11209 - Sociomedical Sciences

This course is designed to acquaint students with the basic tools, concepts and methods for the study of health, illness, and community life by focusing on the disciplines of medical anthropology and community-oriented primary care. By the end of this course students should be able to: 1) recognize, define and apply the basic concepts and methods of medical anthropology and community oriented primary care; 2) realize that interactions between health, disease, community life, and culture can be studied in a holistic and scientific fashion and that quite a bit is known about them from this perspective; 3) acknowledge that the social and cultural differences existing among patients and between medical and social systems are variables that need to be taken into account in the treatment of patients; 4) locate and assess medical social science data sources in print and online formats; and 5) understand the need to balance an individual approach to patient care with a population approach.

Credits: 3. Contact Hours: 3 hr./wk. Corequisite: MED 22401.

MED 20000 - Introduction to Human Genetics

This course emphasizes principles and methods of molecular genetics as they relate to human variation and disease, using specific genetic disorders and genetically-determined traits to illustrate key points. Topics include chromosomal and genomic structural variation, Mendelian inheritance and monogenic traits, non-Mendelian inheritance, complex genetic disorders, cancer genetics, and pharmacogenetics.

Credits: 3. Contact Hours: 5 hr./wk.

MED 20300 - Bio-Organic Chemistry

This is a course in which some aspects of a traditional one-year Organic Chemistry course are covered with an emphasis on reaction mechanisms, and stereochemistry. The organic chemistry is immediately applied to the appropriate class of biological molecules. So in effect, we are introducing a more biochemistry-oriented organic chemistry. Topics such as carbohydrates, carboxylic acids and lipids, etc. will be discussed. This integration of organic and biochemistry will diffuse the boundary between the two areas and will better prepare the students for entry into the Molecules-to-Cells course.

Credits: 5. Contact Hours: 4 lect., 1 rec., 3 lab hr./wk. Prerequisite: MED 102.

MED 20400 - Molecules to Cells I

Graded as a year-long course with MED 30500.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: MED 10200, MED 20300, BIO 20600, BIO 20700.

MED 22309 - Fundamentals of Epidemiology

The course combines problem-based learning and lecture. Students will apply basic biostatistical and epidemiological methods to solve population health problems. By the end of the course students will be familiar with probability distributions, statistical tests to compare groups, and epidemiologic study designs, and will have a basic understanding of SPSS software.

Credits: 4. Contact Hours: 4 hours

MED 22409 - Population Health and Community Health Assessment

Practicum in Community Health Assessment is a one-semester course focusing on quantitative data collection and analytical skills fundamental to the understanding of community-based medicine. The student will learn and apply the skills and knowledge necessary to conduct a Community Health Assessment (CHA). In this course students will be required to learn and demonstrate how to: 1) describe a community on the basis of social and environmental factors that affect disease prevalence; 2) apply analytic skills to demographic, socioeconomic and health data. This course employs lectures, workshops, field exercises, and a population laboratory with demographic, socio-economic and health data on New York City neighborhoods.

Credits: 3. Contact Hours: lect., workshop 4hr./wk.

MED 24409 - Evaluation in Healthcare Settings

The field placement is a structured clerkship that introduces students to an inner-city community and a social or health service agency. Each student works in one of numerous agencies located in the Bronx, Manhattan, Queens or Brooklyn under the dual supervision of the Community Medicine faculty/staff and a provider preceptor. Placement sites include health centers, hospital outpatient services, social welfare agencies, and programs for the elderly, adolescents and children. The course is taught during the spring and summer. Students learn interviewing, screening and advocacy techniques. Students work 20 hours per week in a community-based agency. In addition to their agency responsibilities, students: 1. maintain a log of their activities, their interactions with patients and staff, and their analysis of proposed solutions to problems in their own work and that of the agency; 2. prepare an agency report that examines the background, governance,

population served, services and programs, and how the agency is funded; 3. present a case study of a family or individual focusing on the effects of community, sociocultural and economic factors on the patient's health; and 4. conduct a community survey or chart review on a defined population (including questionnaire construction, pilot testing, aggregation and analysis of results).

Credits: 5. Contact Hours: 24hrs./7.5hr./wk. Corequisite: MED 22401.

MED 30500 - Molecules To Cells 2

This two-semester course (MED 20400 and MED 30500) is designed to provide students with comprehensive and integrated concepts of biochemistry, cell biology, and medical genetics within a clinically oriented framework. Topics are presented with the aim that students will become aware of the contribution of cell and molecular biology and genetics to future developments in clinical diagnosis and treatment. Students are expected to acquire the necessary skills to integrate microscopic structure and cellular function, a prerequisite for other disciplines such as Human Development, Medical Histology, Physiology, Immunology, Pathophysiology, and other related areas. Sessions include lectures, small group discussions, and clinical correlations.

Credits: 3. Contact Hours: 5 hours

MED 30501 - Molecules to Cells II

This two-semester course (MED 20400 and MED 30500) is designed to provide students with comprehensive and integrated concepts of biochemistry, cell biology, and medical genetics within a clinically oriented framework. Topics are presented with the aim that students will become aware of the contribution of cell and molecular biology and genetics to future developments in clinical diagnosis and treatment. Students are expected to acquire the necessary skills to integrate microscopic structure and cellular function, a prerequisite for other disciplines such as Human Development, Medical Histology, Physiology, Immunology, Pathophysiology, and other related areas. Sessions include lectures, small group discussions, and clinical correlations.

Credits: 4. Contact Hours: 5 hr./wk. Prerequisite: MED 20400.

MED 31000 - Independent Study

1-4 credits (determined prior to registration by Sophie Davis School faculty member). Students may pursue a program of independent study under the direction of a Sophie Davis School faculty member.

Credits: 1-4. Prerequisite: Determined by faculty member.

MED 31100-32000 - Selected Topics

Selected topics provide an opportunity for the special study of areas not covered in the usual department offerings. Specific topics vary from semester to semester, depending upon student and faculty interest. Prerequisites, credits and hours are determined by Chairperson and Curriculum Committee.

MED 32509 - U.S Healthcare Systems and Policy

This course provides students with the knowledge and skills to critically examine how the U.S. health care system and policy-making apparatus influence the health of Americans. In lectures and small groups, students study the epidemiology of behavioral and environmental risk in U.S. sub-populations, the structure of the health system and medical insurance, and the role of public health, medicine and primary care in influencing health outcomes. Social and political factors of particular relevance to underserved, low income, and minority populations are emphasized. Students are required to develop presentations and written papers for seminars, where topics presented in the readings and lectures are explored in greater depth. In concert with skills previously acquired in Fundamentals of Epidemiology students completing this course will emerge with an understanding of study design as it informs medical outcomes and health services research.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MED 21400, MED 22401, MED 23400 and MED 33501.

MED 33501 - Health, Medicine and Society IV: Fundamentals of Epidemiology

This course equips students with the ability to understand and evaluate the impact of environmental, biological, social, and behavioral risk factors on health and disease through the epidemiology methods. The course uses lectures, small group meetings and assignments to acquaint student with: measures of morbidity and mortality; techniques of epidemiology surveillance including disease outbreaks; appropriate settings for use of cross-sectional, prospective and retrospective study design as methods to examine disease causation and distribution; calculation of relative risk; sources of bias and variability in studies. Lectures and workshops reinforce student facility with statistical methods used in analyzing and interpreting the medical literature. Small group meetings require students to demonstrate the skills of critical evaluation of epidemiology evidence.

Credits: 3. Contact Hours: 3 lect., 1 rec. hr./wk. Prerequisite: MED 21400, MED 22401, MED 23400 and MATH 17700.

MED 33602 - Human Gross Anatomy, Human Dev

The objective of the integrated Human Gross Anatomy and Human Development course is to provide students with hand on experience in the study of the structure and function of the human body, an understanding of relevant aspects of human development and its abnormalities, and the value of imaging techniques in the visualization of the human body. Structure at the macroscopic level is explored through lectures in gross anatomy and embryology coupled with detailed regional dissections. Students are expected to examine anatomic relationships leading to an integration of anatomic function and embryo-fetal development under normal and pathologic conditions.

Credits: 7. Contact Hours: 12 hours

MED 33603 - Histology and Cell Biology

Histology pursues an extension of topics presented in the Molecules to Cells and Human Gross Anatomy-Embryology courses. The main objective is the microscopic identification of cells, tissues, and organs in preparation for the study of normal and abnormal function in further courses on systemic function and pathology. Students are expected to master the material by acquiring concept mapping and critical analysis skills by integrating structural, molecular and functional views of cell and molecular biology and human development through clinical and pathologic examples. This approach intends to highlight the impact of cell and molecular biology in preventive medicine and disease.

Credits: 4. Contact Hours: 80 hrs. per semester Prerequisite: MED 20400 and MED 30500.

MED 33609 - Clinical Anatomy

The objective of the integrated Human Gross Anatomy and Human Development course is to provide students with hand on experience in the study of the structure and function of the human body, an understanding of relevant aspects of human development and its abnormalities, and the value of imaging techniques in the visualization of the human body. Structure at the macroscopic level is explored through lectures in gross anatomy and embryology coupled with detailed regional dissections. Students are expected to examine anatomic relationships leading to an integration of anatomic function and embryo-fetal development under normal and pathologic conditions.

Credits: 5. Contact Hours: 8 hrs/week (lecture, small group, and laboratory) 12 wks Prerequisite: MED 20400 and MED 30500.

MED 34601 - Systemic Functions I (Step 4)

Graded as a year-long course with MED 44700.

Credits: 3. Contact Hours: 64 hrs. per semester Prerequisite: MED 20400, MED 30500, MED 33602 and MED 33603.

MED 36500 - Introduction to Primary Care

This course will be a year-long longitudinal clinical shadowing experience in primary care for third year students. The specific goals of the course will be: To introduce students to primary care practices and careers by establishing a longitudinal relationship between students and a primary care physician. To introduce students to patient centered models of primary care, establish longitudinal relationships between students and patients with chronic illness, and improve early clinical competencies of students in communicating with patients and building physician-patient relationships. To support the learning of biomedical sciences by providing a clinical context for integration of knowledge learned in classroom-based education.

Credits: 0.5. Contact Hours: 19 hours

MED 36600 - Introduction to Primary Care

This course will be a year-long longitudinal clinical shadowing experience in primary care for third year students. The specific goals of the course will be: To introduce students to primary care practices and careers by establishing a longitudinal relationship between students and a primary care physician. To introduce students to patient centered models of primary care, establish longitudinal relationships between students and patients with chronic illness, and improve early clinical competencies of students in communicating with patients and building physician-patient relationships. To support the learning of biomedical sciences by providing a clinical context for integration of knowledge learned in classroom-based education.

Credits: 0.5. Contact Hours: 21 hours

MED 39509 - Practice of Medicine 2

The course will be a longitudinal clinical experience in primary care for third year students. Students will participate in clinical care sessions with a primary care physician preceptor in the community.

Credits: 2. Contact Hours: 15 field work hours and 6 recitation hrs. per semester. Offered: Fall.

MED 42700 - Patient-Doctor I

Graded as a year-long course with Patient-Doctor II.

Credits: 1. Contact Hours: 5 hr./wk.

MED 42800 - Patient-Doctor II

The Patient-Doctor Sequences I and II are two consecutive longitudinal clinically oriented academic sequences designed to meet the needs of fourth-year students. Patient-Doctor Sequences I and II enable the students to acquire, integrate, properly apply knowledge for, and develop the skills and attitudes to engage in effective patient centered medical interviewing through the study of all aspects of the doctor-patient relationship, review of systems, and medical decision-making. Students are also introduced to primary care practice. The experience is structured to enhance students' familiarity with the multiple facets of primary care medicine. Rotation at partner Community Health Centers under the supervision of community-based primary care physicians will encourage students to hone their diagnostic skills, become familiar with community-based medical practices, and develop role-model relationships with primary care physicians. Patient-Doctor Sequences I and II rely on the following didactic components: interactive lectures, small group learning formats, videotape-based sessions, role-playing tutorials, standardized patient tutorials, and medical interviewing practice seminars. Summative and formative evaluation will consist of written clinical essays, and Group Objective Structured Clinical Examinations.

Credits: 3. Contact Hours: 5 hr./wk.

MED 44700 - Systemic Functions II (Step 4)

This two-semester course (MED 34601 and MED 44700) is designed to provide medical students with an understanding of the physiological principles needed for the practice of clinical medicine. It covers a range of topics from cellular physiology to the physiology of organs and organ

systems. Students are expected to apply their knowledge of anatomy and biochemistry in studying these areas. The course includes topics devoted to the study of membrane physiology, muscle physiology, the cardiovascular system as well as renal, respiratory, gastrointestinal and endocrine systems. Instructional activities include lectures, clinical case discussions, student-centered problem-based learning sessions, reviews, problem-solving and computer-based exercises.

Credits: 5. Contact Hours: 95 hrs. per semester Prerequisite: MED 34601.

MED 45701 - Medical Pharmacology (Step 5)

This step is designed to introduce medical students to the rational basis of drug use. It emphasizes the fundamentals of drug absorption, distribution, metabolism and elimination. Students will learn the relation between drugs and receptors, adverse drug reactions and drug use in special populations. The step will focus on mechanisms by which drugs elicit their clinical effects and the evaluation and treatment of drug toxicity. The course includes units devoted to the study of drugs affecting the autonomic nervous, the cardiovascular system, diuretics, drugs influencing the endocrine system, chemotherapeutic drugs and agents used in the treatment of inflammation. Instructional activities include lectures, clinical case presentation, student-led discussions of clinical cases and laboratory.

Credits: 7.5. Contact Hours: 134 hrs. per semester Prerequisite: MED 44700.

MED 46800 - Neuroscience (Step 6)

This course is designed to introduce students to basic principles of neuroanatomy and neurophysiology. The fundamentals of structure and function of the brain and spinal cord at both the microscopic and gross levels of organization are examined. Particular emphasis is placed on questions of clinical relevance. Students are encouraged to relate their understanding of the neuroanatomical and physiological principles to solving clinical issues.

Credits: 5. Contact Hours: 103 hrs. per semester Prerequisite: MED 20400.

MED 47802 - Behavioral Medicine (Step 7)

Behavioral Medicine is a principle-driven/learner-centered/small-group-and-case based academic module that promotes acquisition and integration of knowledge, skills, attitudes, and values that permit students to: 1) Use behavioral science concepts and strategies to integrate patient-centered, disease-based, population-based, and evidence-based medicine into primary care medicine, 2) Communicate effectively and efficiently within the doctor-patient relationship, with professionals and the public, and 3) Promote lifestyle changes in the service of health promotion and disease prevention. In Behavioral Medicine students learn to recognize, appraise, and contrast normal and abnormal behavior through the study of pathophysiology and psychopathology so as to comfortably negotiate the various aspects of human behavior in health and illness. Students learn that the essence of being human lies in the interrelationships among biology, behavior, cognition, environment, society, and culture, and master the essential aspects of growth and development along the life cycle. Students learn the foundation of medical assessment, which is the evaluation of behavior manifested as symptoms and signs, their origins and consequences along a time axis. In Behavioral Medicine students learn the emotional aspects of illness, human coping behavioral patterns, and personality and behavioral styles and their role in health and illness. Through graduated immersion in Behavioral Medicine students hone their interpersonal and communication skills, develop cross-cultural competence, flexibility, and tolerance in medical practice. Students participate in interactive lectures, large and small group learning formats, PBL's, small-group tutored and tutorless seminars, videotape-based sessions, case based small group sessions, and case conferences, review the pertinent literature, integrate new and previously studied relevant material, and participate in experiential projects, all intended for application in clinical medicine.

Credits: 4. Contact Hours: 64 hrs. per semester

MED 48801 - Host Defense, Infection, and Pathogenesis (Step 8)

This course integrates the biomedical disciplines of immunology and medical microbiology with the pathophysiology of infectious and/or immunological diseases and the appropriate pharmacology, emphasizing the relevance to the clinical setting. Students learn fundamental concepts and terminologies of immunology, bacteriology, virology, parasitology and mycology with an emphasis on mechanisms of microbial disease transmission, interwoven with an understanding of host defense mechanisms. A basic understanding of the classification and characteristics of infectious micro-organisms, the mechanisms by which infectious agents cause disease, methods of both prevention and treatment are highlighted. Causes and treatments of immune diseases are also emphasized. Students become familiar with the concepts of inflammation, sepsis, cell injury, tissue repair, hemodynamic disorders, genetic disorders, environmental and nutritional pathology, immunodeficiency diseases, autoimmune diseases, allergy, metabolic diseases and neoplasia. Throughout the course, small group tutorials and interactive clinical correlations based on clinical cases link basic science concepts to clinical medicine. Laboratories in microbiology and immunology introduce students to some of the basic techniques used in diagnostic laboratories for the identification of infectious bacteria, parasites and fungi, and acquaint students with laboratory tests that are routinely performed in diagnostic clinical microbiology and immunology laboratories. Laboratories also utilize diagnostic unknowns to train students in the interpretation of clinical case histories and the isolation and characterization of micro-organisms involved in infectious diseases. General pathology laboratories focus on observations of gross specimens and light microscopic examination of diseased tissues to identify the features of general pathological processes relevant to diverse disease states. Tutorials, clinico-pathological correlations and laboratories emphasize problem-solving skills, integration of knowledge and independent learning.

Credits: 10. Contact Hours: 248 hrs. per semester Prerequisite: MED 30500, MED 33602 and MED 33603.

MED 51902 - Systemic Pathology I (Step 10)

Graded as a year-long course with MED 51903.

Credits: 5.5. Contact Hours: 119 hrs. per semester Prerequisite: MED 48801.

MED 51903 - Systemic Pathology II (Step 10)

In the Systemic Pathology course, students learn to apply the principles and mechanisms of diseases. The course covers the disease process in all organ systems, including a separate section on the cardiovascular system, with the pertinent pathophysiologic correlations. The basic clinical aspects of systemic disease are introduced and correlated with the morphologic features of the diseases. The course utilizes lectures with kodachrome slides, power point presentations, essay assignments, laboratory sessions with gross specimens and pertinent clinical histories, microscopic slides, and review sessions.

Credits: 2. Contact Hours: 38 hrs. per semester Prerequisite: MED 51902.

MED 52902 - Introduction to Clinical Medicine I (Step 11)

Graded as a year-long course with MED 53003.

Credits: 5. Contact Hours: 70 hrs. per semester

MED 53003 - Introduction to Clinical Medicine II (Step 11)

This two-semester course (MED 52902 and MED 53003) is designed to build upon students' knowledge of the basic sciences and prepare them for the clinical clerkship in medicine. The course integrates pathophysiology with clinical medicine, and is taught using case studies. Topics include cardiology, endocrinology, gastroenterology, gerontology, hematology, immunology, infectious diseases, medical genetics, nephrology, nutritional aspects of diseases, obstetrics and gynecology, oncology, pulmonary medicine, and rheumatology.

Credits: 6. Contact Hours: 88 hrs. per semester

MED 53900 - Clinical Decision Making & Evidence-Based Medicine

This course focuses on applications of the scientific method to evaluations of medical practice. Through lectures and problem-solving workshops, the course reviews the methods of evidence-based assessment of the medical literature. Using examples taken from the peer-reviewed scientific literature, students gain understanding of core concepts such as probability, sensitivity and specificity of diagnostic testing, measurement of risk, pre- and post-test likelihoods, decision analysis and cost effectiveness analysis. These concepts are built upon in small group settings in the context of decision-making within clinical practice.

Credits: 2. Contact Hours: 2 lect., hr./wk. Prerequisite: MED 33501.

MED 54900 - Physical Diagnosis I

Credits: 5. Contact Hours: 1 hr/wk Prerequisite: None

MED 55000 - Physical Diagnosis II

This course instructs the student in the art and technique of the patient interview and physical examination through a lecture series, a smaller group tutorial segment, and actual bedside patient examinations.

Credits: 4. Contact Hours: 4 hrs/wk Prerequisite: MED 54900

MED 59901 - Neuro-Psychiatry (Step 9)

Neuro-Psychiatry combines aspects of behavioral science, psychiatry, psychopharmacology, and clinical neuroscience. This constitutes an integrated learning module administered by the Departments of Behavioral Medicine and Physiology and Pharmacology. Neuro-Psychiatry integrates important material gleaned from behavioral science, neuroscience, physiology, general pharmacology, psychopharmacology, neuropharmacology, psychopathology, pathophysiology, and clinical epidemiology. It aims to guide students in acquiring the basic knowledge, skills, and attitudes regarding prevalent psychiatric and neurological disorders. The disorders will be thoroughly covered with regard to phenomenology, diagnosis, pathophysiology, and therapeutics.

Credits: 3. Contact Hours: 64 hrs. per semester

MHC - Macaulay Honors College Course Descriptions

MHC 10101 - The Arts In NYC

A broad exposure to the arts in New York City. Attendance at performances, exhibitions and other cultural events is central to the course. Students examine these events from the multiple perspectives of scholarship, creativity and production and enhance their appreciation by investigating the social, historical and aesthetic context of the cultural works.

Credits: 3. Contact Hours: 3 hours

MHC 10201 - The Peopling Of NYC

Credits: 3. Contact Hours: 3 hours

MHC 20301 - Science & Tech NYC

Credits: 3. Contact Hours: 3 hours

MHC 20401 - Shaping Future NYC

Credits: 3. Contact Hours: 0 hours

MSCI - Military Science Course Descriptions

MSCI 10100 - Introduction to Leadership I

This is an entry-level course exploring basic tactical and leadership concepts simultaneously providing students with an introduction to the

U.S. Army and a familiarization with fundamentals of leadership that are applicable outside the military. Students will develop basic knowledge and skills needed for personal leadership competence sought after in military or civilian career fields. Open to all students and does not require an obligation to the U.S. Army. Participation in the Leadership Lab is optional and encouraged. 3 hr./wk; 3 cr.

Credits: 3. Contact Hours: 3 hr./wk

MSCI 10200 - Introduction to Leadership II

This is an entry-level survey course to introduce students to the United States Army and its Reserve Officers' Training Corps (ROTC). Topics include the organizational structure of the military, procedures followed in military activities and types of skills needed to succeed in the military. The aim of the course is to use small unit scenarios as a vehicle to study decision-making, planning and leadership. Open to all students and does not require an obligation to the U.S. Army. Participation in the Leadership Lab is optional and encouraged.

Credits: 3. Contact Hours: 3 hr/wk.

MSCI 20100 - Foundations of Leadership I

This is an entry-level survey course to introduce students to leadership theory and skills at the small group / unit level. It uses the study of U.S. Army squad tactics to emphasize multiple leadership techniques. Additionally, it examines the traits of effective leaders with emphasis on their communication skills. Students will understand that different circumstances and group dynamics may require an adjustment of style to accomplish a task. Effective communication skill is highlighted throughout. Open to all students and does not require an obligation to the U.S. Army. Participation in the Leadership Lab is optional and encouraged.

Credits: 3. Contact Hours: 3 hr./wk

MSCI 20200 - Foundations of Leadership II

This is an entry-level survey course to introduce students to leadership theory and skills at the small group / unit level. Course expands on small unit leadership but increases the leader's extent of control from a 9-person squad to a 40-person platoon. It requires students to exercise effective communication skills by placing them in situational leadership positions. Different military scenarios (offense, defense, reconnaissance) are employed where students can pick from different leadership techniques to make decisions. Open to all students and does not require an obligation to the U.S. Army. Participation in the Leadership Lab is optional and encouraged.

Credits: 3. Contact Hours: 3 hr./wk.

MSCI 30100 - Adaptive Team Leadership I

This is a closed course for students in their third year of the Military Science program. Students study, practice, and apply the fundamentals of Army leadership, officership, Army values and ethics, personal development, and small unit tactics at the team and squad level. Theory, skills and training to plan, and lead a team or squad in the execution of a practical exercise, a Leadership Lab, or during a Field Training Exercise (FTX) are part of the coursework. MSCI 300 and 400 courses are only open to those students who are contracted with the U.S. Army ROTC. Participation in Physical Training, Leadership Lab and field trips are required.

Credits: 3. Contact Hours: 3 hr./wk Prerequisite: MSCI 20200 or assessed equivalency based on prior military service. Contracted Cadets only.

MSCI 30200 - Adaptive Team Leadership II

This is a closed course for students in their third year of the Military Science program. Students apply Army leadership methods to situational training exercises in order to develop their own effective leadership styles. Students will exercise Army values and ethical decision-making at the squad and platoon levels. At the conclusion of the course, students will possess the required leadership skills to plan and issue orders necessary to lead a small unit. MSCI 300 and 400 courses are only open to those students who are contracted with the

U.S. Army ROTC. Participation in the Leadership Lab, Physical Training and field trips are required.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MSCI 30100 or assessed equivalency based on prior military experience. Contracted Cadets only.

MSCI 40100 - Adaptive Leadership I

This is a closed course for students in their final year of ROTC training. The course trains college seniors in the skills needed for success as a 2nd Lieutenant in the U.S. Army. Topics covered include ethics, planning, briefing and running training events. Students are given instruction in the theory behind Army training methods and then apply these techniques through individual or group projects aimed at providing training for the lower level ROTC students. Students will plan, and conduct the laboratory training component attended by the first through third students as practical exercises to their classroom instruction. Participation in the Leadership Lab, Physical Training, and field trips are required.

Credits: 3. Contact Hours: 3 hr./wk Prerequisite: MSCI 30200, contracted Cadets only.

MSCI 40200 - Adaptive Leadership II

This is a closed course for students in their final year of ROTC training. The course trains college seniors in the skills needed for success as a 2nd Lieutenant in the U.S. Army. Topics covered include non-commissioned officer relationships, effective military writing and speaking, joint ethics regulations, and the code of conduct. Students are given instruction in the theory behind Army training methods and then apply these techniques through individual or group projects aimed at providing training for the lower level ROTC students. Students will plan, and conduct the laboratory training component attended by the first-through third- students as practical exercises to their classroom instruction. Participation in Physical Training, Leadership Lab and field trips are required.

Credits: 3. Contact Hours: 3 hr./wk Prerequisite: MSCI 40100, contracted Cadets only.

MUS - Music Course Descriptions

MUS 10100 - Introduction to Music

Concepts underlying the understanding and enjoyment of music. Examples from around the world highlight matters of form and content. Attendance at concerts, both on and off campus, as well as guided classroom listening aid in the development of listening and communication skills.

Credits: 3. Contact Hours: 3 hr./wk.

MUS 10101 - Introduction to Music (Honors)

An alternate version of MUS 10100 for Honors students. Concepts underlying the understanding and enjoyment of music. Examples from around the world highlight matters of form and content. Attendance at concerts, both on and off campus, as well as guided classroom listening aid in the development of listening and communication skills.

Credits: 3. Contact Hours: 3 hr./wk.

MUS 10200 - Introduction to World Music

An exploration of music from around the world and its relation to cultural forces. Investigates music related to religion, ritual, politics, work, and social function in terms of musical form, style, and literary content. Does not serve as a prerequisite for courses in the music major.

Credits: 3. Contact Hours: 3 hr./wk.

MUS 10201 - Introduction to World Music (Honors)

An alternate version of Music 10200 for students in the Honors Program. An exploration of music from around the world and its relation to cultural forces. Investigates music related to religion, ritual, politics,

work, and social function in terms of musical form, style, and literary content.

Credits: 3. Contact Hours: 3 hr./wk.

MUS 13100 - Elementary Musicianship

Ear-training, sight-singing; rudimentary theory, rhythm, basic writing skills. For potential Music majors and students continuing in music theory. Not for elective concentration for Music majors.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: Permission of the department.

MUS 13200 - Tonal Harmony and Voice-Leading I - Introduction to Diatonic Practices

An introduction to Western diatonic classical harmony and voice leading. Topics include: four-part harmony, voice-leading, harmonic progression, figuration and embellishing tones, overview of species counterpoint, I, V (7), and their inversions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Permission of the department: only students who pass the Music Theory placement exam (offered at the beginning of each term) may enroll in 13200.

MUS 14500 - Introduction to Jazz

An introduction to the important figures and diverse styles of jazz. Emphasis will be on listening to jazz and its unique characteristics including identifying various instruments and their roles in jazz ensembles. Attendance at concerts both on and off campus as well as guided classroom listening will aid in the development of listening and communication skills. The influence of folk and popular music from all related cultures will be discussed as well as social issues that affected the music's growth and popularity. Does not serve as a prerequisite for courses in the Music major.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: None.

MUS 14501 - Introduction to Jazz (Honors)

An alternate version of Music 10200 for students in the Honors Program. An introduction to the lives and styles of important jazz musicians. Guided classroom listening will focus on the unique characteristics including identifying various instruments and their roles in jazz ensembles. Attendance at concerts both on and off campus will aid in the development of listening and communication skills. The influence of folk and popular music from all related cultures will be discussed as well as social issues that affected the music's development.

Credits: 3. Contact Hours: 3 hr./wk.

MUS 15200 - Fundamentals of Music for Elementary School Teachers

Acquiring basic music skills. Singing, piano, recorder, principles of notation and tonality, conducting, ear training, simple harmony. Not for elective concentration for Music majors.

Credits: 2. Contact Hours: 3 hr./wk.

MUS 15400 - Beginning Piano

Basic music notation, styles and trends explored while learning to play the piano. No previous musical training necessary. Those who wish to become Music majors should take MUS 13100 and MUS 16100.

Credits: 2. Contact Hours: 2 hr./wk.

MUS 16000 - Large Performing Ensembles

May be taken by B.A. students four times for credit, by B.F.A. students, eight times.

Credits: 1. Contact Hours: 3 hr./wk. Prerequisite: Audition.

MUS 16001 - Orchestra

Credits: 1.

MUS 16002 - Chorus

Credits: 1.

MUS 16004 - Large Jazz Ensemble

Credits: 1.

MUS 16005 - Jazz Ensemble Workshop

A workshop/ensemble designed to provide opportunities for students to improve the skills required to perform with various City College jazz ensembles. Emphasis will be placed on note reading, rhythms, section playing, intonation, tone production, expression of dynamic and articulation markings, and phrasing. May be repeated for credit.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: Permission of the instructor. Corequisite: MUS 35700 or higher and MUS 32300 or higher.

MUS 16100 - Aural Fundamentals

An introduction to singing and dictation skills: matching pitch, singing scales and rudimentary diatonic melodies, sight-singing, and the fundamentals of melodic dictation. This course also serves as preparation for the music major entrance exam. For potential music majors.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: Permission of the department.

MUS 16200 - Theory Practicum I

The companion course to Music 13200. Gives students an opportunity to apply the skills and knowledge acquired in Theory 1 to sight singing, rhythm, keyboard, and ear-training activities. Serves as a review and reinforcement of the concepts learned in Theory 1.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: Or Coreq: MUS 13200.

MUS 16300 - Fundamentals of Jazz Harmony

A preparatory course in jazz practices and ear training. Topics include: how to practice jazz, the psychology of music, jazz notation, transpositions, lead sheet preparation, ear-training as well as a brief overview of jazz theory. Students should bring their instruments on selected days.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: Permission of the department.

MUS 16400 - Class Instruction in Piano I

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: MUS 16100 or MUS 15400.

MUS 16500 - Class Instruction in Voice I

Credits: 1. Contact Hours: 2 hr./wk.

MUS 16900 - Introduction to Jazz Improvisation

A beginning course in jazz improvisation. Fundamental jazz repertoire, scale/chord relationships, construction of improvised solos, rhythm section "comping," and group interaction will be discussed and practiced in a combo setting. Students should bring instruments to each class.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: None. Corequisite: MUS 13200 or permission of the instructor.

MUS 21000 - Writing About Music

Intended to help music majors and others interested in exploring the different strategies and styles pertaining to reading, thinking, and writing about music. This course satisfies the requirement of the second level writing course.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS or ENGL 11000 and MUS 10100 and MUS 13100.

MUS 21500 - Music Notation and Software

An introduction to digital music notation software. The course will focus on basic MIDI setup, data entry, score layout, part extraction and playback. Data entry topics will include, staves, clefs, key signatures, pitch, rhythm, dynamics, expression marks, articulation, chord symbols and lyrics, drum/percussion notation as well as manipulations such as transposing, copy and paste and independent elements. Score layout

will include rehearsal letters, measures per line, bar lines, measure numbers, titles, page numbers, layers, repeats, multiple measure rests, page turns, and part extraction, printing. Playback options will include sound libraries, tempo settings, mixing and human playback.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: MUS 13100, MUS 16100. Corequisite: MUS 13200, MUS 16200.

MUS 21600 - Music Production: MIDI & Audio

Overview of contemporary music production, recording, sound design concepts, and techniques, including a hands-on lab component.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: Prereq or Coreq: MUS 10100, MUS 13100, and MUS 16100 or permission of the department.

MUS 21700 - Basic Audio Technology Concepts

Introduction to the basic concepts and technologies of the audio industry. Acoustics (sound generation, frequency and pitch, the overtone series, waveforms, bells and decibels, etc.). Basic electricity (laws of charges, conductors and insulators, voltage/current/resistance, circuits, magnetic induction, etc.). Interfacing audio equipment (impedance standards, balanced and unbalanced interconnections, audio connectors, standard operating levels, etc.). Lecture course. No studio time required.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Prereq or Coreq: MUS 13100 and MUS 16100 or permission of the department.

MUS 21800 - Introduction to Audio Recording Technology & Practice

Components, functions, and signal flow of analog mixing consoles. Signal flow in contemporary digital audio workstations and digital mixing consoles. Digital audio interface formats and digital audio synchronization. Application of signal flow concepts to modern recording/mixing techniques. Microphone design, application, and selection. Students are assigned individual studio time.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 21700 and Pre/Coreq MUS 13200, MUS 16200, and MUS 21900 or permission of the department.

MUS 21900 - Introduction to Music Production Techniques

An exploration of the concepts underpinning today's Digital Audio Workstations. Practical hands-on experience with MIDI and audio recording, programming, editing, and arranging. Projects for individuals and groups will give students the opportunity to create original music and sound design using these technologies.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 21700 or permission of the department; pre/co-req: MUS 13200, MUS 16200, MUS 21800 or permission of the department.

MUS 23100 - Tonal Harmony and Voice-Leading II - Diatonic Practices

A continuation of harmony and voice-leading study of the common-practice diatonic vocabulary: predominant chords, predominant seventh chords and their inversions, cadential embellishment, leading-tone seventh chords, VI, embellishing tones, III and VII, sequences, and 6/4 chords.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 13200.

MUS 23200 - Tonal Harmony and Voice-Leading III - Chromatic Practices

A continuation of harmony and voice-leading study, involving the common-practice chromatic vocabulary: applied chords, tonicization and modulation, mode mixture, the Neapolitan sixth, augmented sixth chords, chromatic sequences, and chromatic modulation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23100.

MUS 24100 - History I - Antiquity through the Renaissance

Musical thought of the Middle Ages. Evolution of plainchant; origins and organization of polyphony, Ars Nova. Modes, musica ficta, trends toward homophony. Mass, motet, chanson, and madrigal in 15th and 16th centuries.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 21000 or equivalent and MUS 13200.

MUS 24200 - History II - The Baroque through the Early Classic Era

Monody and basso continuo. Emergence of opera, oratorio, cantata and Passion. The suite, concerto grosso and baroque sonata. Learned, galant and bourgeois styles. Beginnings of classical sonata, symphony, concerto, chamber music.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23100 and MUS 24100.

MUS 24400 - A Concise History of Jazz

A chronological survey of jazz from its origins through the present focusing on the key innovators and diverse styles. Emphasis will be placed on listening directed towards the techniques of improvisation, arranging, and performances practices. Guided classroom listening, as well as attendance at concerts both on and off campus, will aid in the development of perception and communication skills. The influences of music from other styles and cultures will be included as well as social issues that affected jazz's development.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: FIQWS or ENGL 11000, MUS 10100 and MUS 13200. Corequisite: MUS 21000 or equivalent.

MUS 26000 - Ensemble Performance

Experience in performing in small groups. In addition to ensembles listed, other types of ensembles will be offered to suit the particular interests and abilities of students. May be taken eight times.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: Permission of the Department and/or audition.

MUS 26001 - Chamber Music

Credits: 2. Contact Hours: 2

MUS 26002 - Vocal Ensemble

Credits: 2. Contact Hours: 2

MUS 26003 - African Drumming

A performance ensemble and workshop focusing on traditional styles of African music and developing performance skills on a variety of African percussion instruments.

Credits: 2. Prerequisite: Music major status or permission of instructor. Contact Hours: 2.

MUS 26004 - Small Jazz Ensemble

Small jazz ensembles focusing on bebop, post-bop and contemporary styles. For upper level jazz majors.

Credits: 2. Prerequisite: BFA jazz majors only, audition by instructor. Contact Hours: 2.

MUS 26005 - Latin Band

A performance ensemble focusing on repertory representing traditional and popular forms of Afro-Cuban and Caribbean music, including son, rumba, bolero, danzon, and mambo.

Credits: 2. Contact Hours: 2. Prerequisite: Music major status or permission of instructor.

MUS 26008 - Brass Ensemble

Credits: 1.

MUS 26009 - Collegium Musicum

Credits: 1.

MUS 26010 - Bass Ensemble

Credits: 1.

MUS 26011 - Brazilian Jazz Ensemble

Credits: 1.

MUS 26012 - Improvisational Music Ensemble

Credits: 1.

MUS 26013 - Jazz and World Music Ensemble

Credits: 1.

MUS 26014 - Jazz Repertory Ensemble

Credits: 1.

MUS 26015 - Jazz Vocal Ensemble

Credits: 1.

MUS 26016 - Guitar Ensemble

Credits: 1.

MUS 26017 - Blues Vocal Workshop

Credits: 1.

MUS 26018 - Rock Ensemble

Credits: 1.

MUS 26019 - Klezmer Ensemble

Credits: 1.

MUS 26100 - Theory Practicum II

The companion course to Music 23100. Gives students an opportunity to apply the skills and knowledge acquired in Theory 2 to sight singing, rhythm, keyboard, and ear-training activities. Serves as a review and reinforcement of the concepts learned in Theory 2.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: MUS 13200, MUS 16200 or equivalent. Corequisite: MUS 23100.

MUS 26200 - Theory Practicum III

The companion course to Music 23200. Gives students an opportunity to apply the skills and knowledge acquired in Theory 3 to sight singing, rhythm, keyboard, and ear training activities. Serves as a review and reinforcement of the concepts learned in theory.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: MUS 23100, MUS 26100 or equivalent. Corequisite: MUS 23200.

MUS 26400 - Class Instruction in Piano II

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: MUS 16400 and permission of the department.

MUS 26500 - Class Instruction in Voice II

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: MUS 16500 and permission of the department.

MUS 27100 - Series: Topics in Popular Music

A group of courses dealing with the history and literature of popular music.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 10100 or permission of the Department.

MUS 27103 - A Survey of Popular Music

Credits: 3.

MUS 27104 - Latin Popular Music

Credits: 3.

MUS 27105 - Gospel Music

Credits: 3.

MUS 27106 - The American Musical

Credits: 3.

MUS 27400 - Series: Topics in Folk Music

Music in a changing world. Important trends in rural and urban folk music.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 10100 or permission of the department.

MUS 27401 - Survey of Afro-American Music

Credits: 3.

MUS 27402 - Latin American and Caribbean Folk Music

Credits: 3.

MUS 27403 - Survey of Anglo-American Music

Credits: 3.

MUS 27500 - Jazz Piano I

Elementary techniques for playing piano in jazz style. Chord identifications. Techniques for accompanying with or without melody, and with or without bass. Standards and jazz tunes. Extended chords.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: MUS 16300 or departmental permission. Corequisite: MUS 35700 or permission of the Department.

MUS 27600 - Jazz Piano II

Continuation of MUS 27500. Blues. Altered dominant chords. Stride style. Harmonic complexities. Standards and jazz tunes.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: MUS 27500. Corequisite: MUS 35800 or permission of the Department.

MUS 29900 - The Musician Entrepreneur

Designed to help develop the student's music business acumen. An intensive exploration of all aspects of the music business, marketing, social networking, and law that are required to manage an artist's career successfully in the contemporary market.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 21000.

MUS 30100-30300 - Honors I - III

Approval of Dean and Department representative required. Apply no later than December 10 in the Fall term or May 1 in the Spring term.

Credits: Credit variable. Contact Hours: Credit variable, but usually 3 credits per term.

MUS 31001-31003 - Independent Study

Individual scholarly or creative work under supervision of a full-time faculty mentor. May be taken up to a total of 12 credits.

Credits: 1-3. Prerequisite: Permission of the department.

MUS 31100-32000 - Selected Topics in Music

A changing series of innovative and experimental courses on topics not generally covered in regular courses. Course announcements will be made the preceding semester.

Credits: Hours and credits to be arranged..

MUS 32100 - Synthesis and Sound Design I

Review of acoustics. Principles of voltage control systems. Subtractive synthesis, additive synthesis, matrix modulation, and sample playback synthesizers. Examination of both software and hardware synthesizers. Students create original sounds and music for synthesis and sound design projects throughout the semester. Students are assigned individual studio time.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 21800 or permission of the department.

MUS 32200 - Synthesis and Sound Design II

Percussion oriented sample playback hardware and software. Amplitude and frequency modulation synthesis. Vector synthesis and wave sequencing. Granular synthesis. Resampling technology. Audio modulation software and plug ins. Students create original sounds and music for synthesis and sound design projects throughout the semester. Students are assigned individual studio time.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 32100.

MUS 32300 - Jazz Repertory and Performance Practices I

Basic exercises for developing skills in sight reading and rhythmic execution. Sight reading arrangements and charts. Ear training. Techniques for effective practicing and memorization. Playing in various keys and developing transposition skills. Interpreting meters and related jazz styles. Memorization of standard jazz repertoire. Techniques for combo performance and small ensemble performance.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MUS 13200, MUS 16200. Corequisite: MUS 35700, MUS 27500.

MUS 32301 - Jazz Repertory and Combo Performance 1

Learning standard jazz repertory in various styles through memorization of chosen repertoire and performance. Emphasis on developing skills for small group performance.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: Permission of the Department.

MUS 32311 - Jazz Vocal Repertory and Performance Practices I

A course devoted to learning important tunes from the standard and jazz repertory, as well as common jazz performance practices. The course includes in-class performance, lead-sheet preparation, transposition, interpretation, phrasing, second-chorus improvisation, arranging, and the development of skills in leading and interacting with the band.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: or Coreq: MUS 35701, MUS 27500, MUS 35703.

MUS 32400 - Jazz Repertory and Performance Practices II

Intermediate exercises for developing skills in sight reading and rhythmic execution. Sight reading arrangements and charts. Ear training. Techniques for effective practicing and memorization. Playing in various keys and developing transposition skills. Interpreting meters and related jazz styles. Memorization of standard jazz repertoire. Techniques for combo performance and small ensemble performance.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MUS 32300, MUS 27500. Corequisite: MUS 35800, MUS 27600.

MUS 32401 - Jazz Repertory and Combo Performance II

Learning standard jazz repertory in various styles through memorization of chosen repertoire and performance. Emphasis on developing skills for small group performance.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: MUS 32301 and permission of the Department.

MUS 32411 - Jazz Vocal Repertory and Performance Practices II

A course devoted to learning important tunes from the standard and jazz repertory, as well as common jazz performance practices. The course includes in-class performance, lead-sheet preparation, transposition, interpretation, phrasing, second-chorus improvisation, arranging, and the development of skills in leading and interacting with the band.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: MUS 35701, MUS 27500, MUS 35703. Corequisite: MUS 35801, MUS 27600, MUS 35803.

MUS 32500 - Digital Audio I

Basic concepts of audio analog-to-digital and digital-to-analog conversion. Quantization error, dithering, sample rate, word length, normalization. An extensive discussion of two-track and multi-track hard disk recording systems. Destructive and non-destructive editing, playlists, files and regions, voice allocation vs. channels. Host based and native DSP. Audio editing in Peak, Pro Tools, and Logic Audio. Students are assigned individual studio time.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 21800 or permission of the department. Corequisite: MUS 21900.

MUS 32600 - Digital Audio II

Working with samples using hardware and software samplers. Drum and percussion loops and loop manipulation. Time and pitch processing plug ins. Audio data compression formats for the web. Downloadable and streaming audio protocols for the web. Archiving and backup. The DVD specification. Students are assigned individual studio time.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 32500.

MUS 32700 - Microphone Applications I

Microphone technology (construction, polarity patterns, frequency and transient response). Recording techniques for electric guitar, acoustic guitar, electric bass, and acoustic bass. Students work on recordings during class and during individual studio time.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 32600. Corequisite: MUS 32701.

MUS 32701 - Multi-Track Production Techniques I

Ancillary class to MUS 32700. Advanced concepts and application of dynamic processing. Patch bay construction and configurations. Recording session procedures and documentation. Setting up talkback and headphone mixes for a recording session.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 32600. Corequisite: MUS 32700.

MUS 32800 - Microphone Applications II

Recording techniques for piano, drums, woodwinds, brass, strings, vocalists, and spoken word. Ensemble/band recordings. Students work on recordings during class and during individual studio time.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 32700. Corequisite: MUS 32801.

MUS 32801 - Multi-Track Production Techniques II

Stereo microphone techniques. Advanced filtering and equalization applications. Basic sound reinforcement concepts and applications. Vocal and style based production techniques. Students are assigned individual studio time.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 32701. Corequisite: MUS 32800.

MUS 33100 - Tonal Harmony and Voice-Leading IV - Form and Analysis

The study of form in common-practice tonal music and detailed analytic techniques. Topics include: sentences, periods, binary and rounded binary form, ternary form, rondo form, and sonata theory.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23200.

MUS 33700 - Fundamentals of Jazz Composition

Composition and analysis of standard song forms as well as other standard compositional practices and forms idiomatic to jazz.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 45700 and permission of the instructor.

MUS 34100 - History III - The Classic-Romantic Era

Changing instrumental and vocal styles in the late 18th century. Influences of literature, visual arts in the 19th century. Role of virtuosity. Chromaticism, modality. Opera, symphony, symphonic poem, chamber music and song. National music idioms. Exoticism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23200 and MUS 24200.

MUS 34200 - History IV - Music of the Twentieth Century and Beyond

Late 19th century. Harmonic changes in the early 20th century. Breakdown and reinterpretation of tonality. Impressionism, Expressionism, Eastern European and Asiatic influences. Twelve-tone system. Traditional and innovative forms. Aleatoric and electronic music.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 33100 and MUS 34100.

MUS 34400 - Jazz History I: From its Origins to 1950

An examination of the roots of jazz and its stylistic evolution and major contributors up to 1950. Emphasis will be placed on detailed listening assignments, a 3500 word writing requirement and readings.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 10100 and ENGL 11000 or equivalent. Pre- or co-req.: MUS 21000 or equivalent.

MUS 34500 - Jazz History II: From 1950 to the Present

An examination of the trends in jazz and its major contributors since 1950. Emphasis will be placed on detailed listening assignments, a 3500 word writing requirement and readings.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 10100 and ENGL 11000 or equivalent. Pre- or co-req.: MUS 21000 or equivalent.

MUS 35000 - Studio Ensemble Singing

Exploration and application of non-jazz vocal styles; the art of background vocals; application of musicianship skills; studio and recording skills; and basic knowledge of sound systems for live performances. Includes lectures, application of musical concepts, performances, videotaping with self-critique, and a vocal session in a recording studio. May be taken twice.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 26100 and permission of the Department.

MUS 35200 - Jazz Arranging I

Basic principles of chord voicing; voicing extended chords. Ranges, transpositions, and instrumental characteristics of the instruments of the standard jazz big band. Chord substitution. Arranging for the small jazz ensemble, from two to five horns with rhythm section. Arranging standard songs.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 35800 and MUS 27600.

MUS 35700 - Jazz Harmony and Improvisation I: Principles of Extended Harmony

A practical study of basic principles of extended chord harmony. Voicings and voice leading of extended chords. Examination of basic diatonic and chromatic chord functions. Improvisation techniques based on tonal centers and harmonic targets. Identification and application of nonharmonic tones. Harmonic and melodic ear training. Transcription and analysis.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: MUS 13200, MUS 16200. Corequisite: MUS 32300, MUS 27500.

MUS 35701 - Jazz Harmony I

The same course as 35700 without the improvisation component. In a 2-day/week harmony and improvisation sequence, this course is designed so that the BFA jazz vocal students may join the instrumentalists during

the harmony session, then attend Musicianship for Jazz Vocalists 1 (35703) on the alternate day.

Credits: 2. Contact Hours: 2 hr./wk. Corequisite: MUS 27500, MUS 35703, MUS 32311.

MUS 35703 - Musicianship and Improvisation for Jazz Vocalists I

Designed to develop and reinforce jazz musicianship skills in the areas of sight singing, dictation, rhythm, and piano to assist in the development of jazz language for vocal improvisation. Transcription, instrumental solos, modes, scales, seventh chords, chord progressions, swing rhythm notation, articulation, scat syllables, piano voicings and bass lines will be covered with emphasis on the ii-V-I progression.

Credits: 2. Contact Hours: 2 hr./wk. Corequisite: MUS 35701, MUS 27500, MUS 32311.

MUS 35800 - Jazz Harmony and Improvisation II: Principles of Functional Harmony

Diatonic and chromatic idioms of tonal organization in standard jazz repertory and "Rhythm Changes." Basic principles of chord substitution and reharmonization. An examination of bebop harmonic and melodic vocabulary and chromatic approach vocabulary. Harmonic and melodic ear training. Transcription and analysis.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: MUS 35700, MUS 27500. Corequisite: MUS 32400, MUS 27600.

MUS 35801 - Jazz Harmony II

The same course as 35800 without the improvisation component. In a 2-day/week harmony and improvisation sequence, this course is designed so that the BFA jazz vocal students may join the instrumentalists during one class session, then attend Musicianship for Jazz Vocalists 1 (35803) on the alternate day.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: MUS 27500, MUS 35703, MUS 32311. Corequisite: MUS 27600, MUS 35703, MUS 32411.

MUS 35803 - Musicianship and Improvisation for Jazz Vocalists II

Designed to develop and reinforce jazz musicianship skills in the areas of sight singing, dictation, rhythm, and piano to assist in the development of jazz language for vocal improvisation. Transcription, instrumental solos, modes, scales, seventh chords, chord progressions, swing rhythm notation, articulation, scat syllables, piano voicings and bass lines will be covered with emphasis on the ii-V-I progression.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: MUS 35701, MUS 27500, MUS 35703. Corequisite: MUS 35701, MUS 27500, MUS 35703

MUS 36000 - Introduction to Contemporary Vocal Styles

Idioms from jazz, folk, pop and rock singing; musical theater, avant-garde techniques; recording studio techniques. May be taken up to eight times.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: Permission of the Department.

MUS 36001 - Jazz Vocal Workshop

Credits: 2.

MUS 36002 - Pop Vocal Workshop

Credits: 2.

MUS 36100 - Theory Practicum IV

Covers concepts taught in Theory 4. Gives students an opportunity to apply the skills and knowledge acquired in the theory sequence to sight singing, rhythm, keyboard, and ear-training activities. Serves as a review of advanced chromatic harmonies and the compositional practices of the 20th century.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: MUS 23200, MUS 26200 or equivalent.

MUS 36201 - Instrumentation and Arranging for Commercial Music

A study of the range, tone quality, transposition, expressive qualities, and arrangements for horns, strings, rhythm sections, and guitars. Introduces the rudiments of commercial music arranging.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23100 or MUS 35700 or MUS 35701.

MUS 36202 - Instrumentation and Arranging for Classical Music

Score reading and writing. A study of the range, tone quality, transposition, and expressive qualities of orchestral instruments. Introduces the rudiments of arranging.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23100 or MUS 35700 or MUS 35701.

MUS 36302 - Choral Conducting

Principles and techniques of choral conducting. Includes some experience in conducting college performing groups.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23200 or MUS 35800.

MUS 38001 - Rhythm Section Seminar

Performance seminar for advanced jazz rhythm section instrumentalists (bass, guitar, piano and drums). May be taken twice.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: MUS 35800, MUS 42400 and audition, or permission of the instructor.

MUS 38002 - Jazz Guitar Styles

An examination of jazz guitar styles and techniques. Transcriptions of masters from all periods, such as Charlie Christian, Wes Montgomery, Jim Hall, Grant Green, Pat Metheny, Ralph Towner, John Abercrombie and others, will be played and analyzed. Performance will focus particularly on the guitar/bass/drums trio, the guitar/bass duo and solo guitar concepts. Some Classical guitar literature will be introduced and other finger-style techniques employing alternative tunings will be examined. A concert of material drawn from the semester's work will be performed by the students.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: Permission of the instructor and the jazz program supervisor.

MUS 38003 - Jazz Drumming and Rhythmic Techniques

A practical study of rhythmic techniques in jazz for non-drummers. Emphasis on swing rhythm, rhythmic independence, polyrhythms, rhythmic phrase construction and rhythmic practices for accompanying. Students will explore the role of the drummer in the jazz ensemble and the characteristics of the drum kit through listening and practice.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: MUS 35800 or MUS 35801, MUS 32400, MUS 27600. Corequisite: MUS 45700, MUS 42300.

MUS 40000 - Special Topics in Western Music

Intensive study in a particular genre, composer or historical period. Topics will vary and will be announced prior to registration.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Permission of the Department.

MUS 42000 - Rock Analysis

This seminar critically explores rock analytical literature by academic music theorists, with an emphasis on post-1965 music and post-1990 essays. Students will examine representative examples of analytical readings of specific rock songs as well as more ambitious attempts to define the style through broad theoretical generalizations. The work will culminate with original analyses modeled on, and ideally expanding, the existing literature.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23200 or MUS 35800.

MUS 42300 - Jazz Repertory and Performance Practices III

Advanced intermediate exercises for developing skills in sight reading and rhythmic execution. Sight reading arrangements and charts. Ear training. Techniques for effective practicing and memorization. Playing in various keys and developing transposition skills. Interpreting meters and related jazz styles. Memorization of standard jazz repertoire. Techniques for combo performance and small ensemble performance.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MUS 32400, MUS 27600. Corequisite: MUS 45700.

MUS 42301 - Jazz Repertory and Combo Performance III

Learning standard jazz repertory in various styles through memorization of chosen repertoire and performance. Emphasis on developing skills for small group performance situations. In addition to standard performance practices, experimental approaches will be introduced, including playing in odd and changing meters, transposing, and playing in alternative rhythmic approaches.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: MUS 32401 and permission of the Department.

MUS 42311 - Jazz Vocal Repertory and Performance Practices III

A course devoted to learning important tunes from the standard and jazz repertory, as well as common jazz performance practices. The course includes in-class performance, lead-sheet preparation, transposition, interpretation, phrasing, second-chorus improvisation, arranging, and the development of skills in leading and interacting with the band.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: MUS 35801, MUS 27600, MUS 35803. Corequisite: MUS 45701, MUS 45703.

MUS 42400 - Jazz Repertory and Performance Practices IV

Advanced exercises for developing skills in sight reading and rhythmic execution. Sight reading arrangements and charts. Ear training. Techniques for effective practicing and memorization. Playing in various keys and developing transposition skills. Interpreting meters and related jazz styles. Memorization of standard jazz repertoire. Techniques for combo performance and small ensemble performance.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: MUS 42300. Corequisite: MUS 45800.

MUS 42401 - Jazz Repertory and Combo Performance IV

Learning standard jazz repertory in various styles through memorization of chosen repertoire and performance. Emphasis on developing skills needed for small group performance situations. In addition to standard performance practices, experimental approaches will be introduced, including playing in odd and changing meters, transposing, and playing in alternative rhythmic approaches.

Credits: 1. Contact Hours: 2 hr./wk. Prerequisite: MUS 42301 and permission of the Department.

MUS 42411 - Jazz Vocal Repertory and Performance Practices IV

A course devoted to learning important tunes from the standard and jazz repertory, as well as common jazz performance practices. The course includes in-class performance, lead-sheet preparation, transposition, interpretation, phrasing, second-chorus improvisation, arranging, and the development of skills in leading and interacting with the band.

Credits: 2. Contact Hours: 3 hr./wk. Prerequisite: MUS 45701, MUS 45703. Corequisite: MUS 45803.

MUS 43000 - Composition

Intensive work in composition of complete pieces, in imitative or free style, according to student's abilities and interests. May be taken twice.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Permission of the Department.

MUS 43200 - Tonal Counterpoint Analysis

Analysis of appropriate models and intensive work in composition of canon, choral-prelude, invention, fugue, etc.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23200 and permission of the department.

MUS 43400 - Audio and Music Industry Internships

At professional music and audio technology facilities. Students observe and interact with production and business practices in the professional marketplace. Requires a minimal commitment of eight-hours per week. May be taken twice.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 23100 or MUS 35700.

MUS 43500 - Audio for Moving Images

Advanced synchronization of audio to moving images. Advanced synchronization of digital audio devices with existing transfer protocols. Introduction to analog and digital video, film, and animation technologies. Video and audio compression codexes. Introduction to video/audio editing software. FX, Foley, narration, dialog replacement, and music bed. QuickTime synchronization and DVD-R authoring. Students are assigned individual studio time.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 32700.

MUS 43600 - Studio Project Workshop

Takes audio techniques learned in prerequisite courses and explores them in more depth and detail. Includes demonstrations, hands-on sessions and exercises, discussion, and independent projects. Introduces various production techniques as well as the people, organizational, and business skills that will be useful in real-world recording and production situations. Students go on field trips to world-class production facilities in New York City, interact with professionals, and intern at such facilities. May be taken twice.

Credits: 3. Materials Fee: \$25. Contact Hours: 3 hr./wk. Prerequisite: MUS 32800 and MUS 32801.

MUS 44100 - Studies in Western Music

Designed for advanced Music majors who wish to pursue specific topics in Western art music, such as composers and genres of various periods; offered on a rotating basis.

Credits: 3. Contact Hours: 3 hr./wk.

MUS 44101 - Studies in Medieval and Renaissance Music

Credits: 3. Prerequisite: MUS 24100.

MUS 44102 - Studies in Baroque Music

Credits: 3. Prerequisite: MUS 24200 and MUS 23100.

MUS 44103 - Studies in Classic Music

Credits: 3. Prerequisite: MUS 34100 and MUS 23200.

MUS 44104 - Studies in Romantic Music

Credits: 3. Prerequisite: MUS 34200 and MUS 33100.

MUS 44105 - Studies in Contemporary Music

Credits: 3. Prerequisite: MUS 34200 and MUS 33100 or MUS 33300.

MUS 45200 - Jazz Arranging II

Arranging for the standard jazz big band. Analysis of form and content of traditional swing and bebop band arrangements. Thickened line, basic chorale, and combination voicings. Line writing and sectional counterpoint. Dynamic shape of the arrangement; thematic exposition and motivic development; repetition and variation. Treatment of texture and climaxes; "shout chorus" and saxophone solo. Preparation of the score and parts. Contemporary and experimental techniques.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 35200.

MUS 45700 - Jazz Harmony and Improvisation III: Advanced Principles of Functional Harmony

Advanced chromatic idioms of tonal organization. An examination of the blues and blues content in related and unrelated forms. Diminished scale harmony and the diminished cycle of chord substitution. Applied chord scale theory and extended harmony. Harmonic and melodic ear training. Transcription and analysis.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: MUS 35800, MUS 27600. Corequisite: MUS 42300.

MUS 45701 - Jazz Harmony III

The same course as MUS 45700 without the improvisation component.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: For instrumental majors: MUS 35800, MUS 32400, MUS 27600. For jazz vocal majors: MUS 35800, MUS 26200, MUS 32401, MUS 27600. Corequisite: For jazz instrumental majors: MUS 42300. For jazz vocal majors: MUS 45702, MUS 42311, MUS 36102.

MUS 45703 - Musicianship & Improvisation for Jazz Vocalists III

Designed to develop and reinforce jazz musicianship skills in the areas of sight singing, dictation, rhythm, and piano to assist in the development of jazz language for vocal improvisation. Transcription, instrumental solos, modes, scales, seventh chords, chord progressions, swing rhythm notation, articulation, scat syllables, piano voicings and bass lines will be covered with emphasis on the ii-V-I progression.

Credits: 2. Contact Hours: 2 hours Prerequisite: MUS 35801, MUS 35803, MUS 27500, MUS 32411

MUS 45800 - Jazz Harmony and Improvisation IV

Nonfunctional Harmony, Modalism and Bitonality Nonfunctional idioms and non-tonal harmonic organization. Bitonality and upper-structure triads. Modal jazz and free jazz. Thirds relations and "Coltrane changes." Advanced reharmonization using bass functions including pedal point, ostinato and linear techniques. Harmonic and melodic ear training. Transcription and analysis.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: MUS 45700. Corequisite: MUS 42400.

MUS 45801 - Jazz Harmony IV

The same course as MUS 45800 without the improvisation component.

Credits: 2. Contact Hours: 2 hr./wk. Prerequisite: For instrumental majors: MUS 45700, MUS 42300. For jazz vocal majors: MUS 45701, MUS 45702, MUS 36102. Corequisite: For jazz instrumental majors: MUS 42400. For jazz vocal majors: MUS 45802, MUS 42411, MUS 36112.

MUS 45803 - Musicianship & Improvisation for Jazz Vocalists IV

Designed to develop and reinforce jazz musicianship skills in the areas of sight singing, dictation, rhythm, and piano to assist in the development of jazz language for vocal improvisation. Transcription, instrumental solos, modes, scales, seventh chords, chord progressions, swing rhythm notation, articulation, scat syllables, piano voicings and bass lines will be covered with emphasis on the ii-V-I progression.

Credits: 2. Contact Hours: 2 Prerequisite: MUS 45701, MUS 45703

MUS 46200 - Orchestration

A continuation of Instrumentation and Arranging. Emphasis on orchestrating for large ensemble.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 36200 and permission of the Department.

MUS 46500 - Advanced Conducting

A continuation of MUS 36300 with more emphasis on score reading.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: MUS 36300 and permission of the department.

MUS 48000 - Individual Instruction

The Music Department will assign an instructor, or give permission to study with a teacher not connected with the College. Student progress is assessed by a juried examination at the end of each semester.

Designed for BA students; BFA students take MUS 49000. May be taken four times.

Credits: 1. Contact Hours: 1 hr. lesson/wk. Prerequisite: MUS 10100, MUS 13100, MUS 16100, and audition.

MUS 49000-49004 - Private Instruction in Instrument or Voice

Eight one-hour lessons per semester. Student progress is assessed by a juried examination at the end of each semester. Designed for B.F.A. students; B.A. students take MUS 48000. May be taken up to eight times.

Credits: 2. Prerequisite: MUS 13100, MUS 16100, and BFA audition. Corequisite: Four (4) other credits of music major courses.

MUS 49002 - Jazz Vocal Instruction

Credits: 3. Contact Hours: 3 hours

NSS - SEEK Counseling and Student Support Services Course Descriptions

SEEK students take advantage of the full range of courses offered to all students in the college. Placement in appropriate introductory courses is based on an evaluation of high school preparation and performance on entrance examinations. Separate SEEK sections are offered in selected courses which are linked to form learning communities. In their first year, SEEK freshmen are enrolled in one of the established learning communities.

NSS 10000 - New Freshman Seminar

New Student Seminar (Required) This seminar will introduce topics and information important to students transitioning to College. Topics will include: Money Matters, Tracking your Academic Progress; Technology and You; Being at College; Awareness and Empowerment and Surviving and Succeeding at City College. Required for all students except those in the Sophie Davis School of Biomedical Education, SEEK and Center for Worker Education (CWE).

Credits: 0. Contact Hours: 1 hour

NSS 10108 - New Student Seminar

All entering SEEK freshmen are required to take the New Student Seminar 10108. This is a non-credit course which provides new students with an orientation to the College and to the SEEK program; disseminates information about college guidelines, regulations and retention standards; helps students to clarify their educational and career goals; encourages the development of greater self awareness and the development of those personal skills and attitudes critical to college success.

Credits: 0. Contact Hours: 1 hr. 15 min./wk.

PA - Physician Assistant Course Descriptions

PA 30100 - History of the Profession

This course introduces students to the history of the P.A. profession through an extensive review of original literature, including readings on medical manpower shortages, patient and provider acceptance, quality of care, substitutability, subspecialty development, and economic issues. The ethics portion explores contemporary ethical issues in the context of the role of a dependent practitioner.

Credits: 1. Contact Hours: 15 lect., 1 hr./wk.

PA 30101 - Orientation/Medical Terminology

The course teaches the principles of scientific reasoning through integrated problem-based learning, study, test taking, scientific reading and writing skills. Students participate in a three-day team building exercise (Ropes course) and seminars, which focus on listening and communication skills development. Students become familiar with the vocabulary of anatomical structures, disease processes, and the medical disciplines in this self-study programmed course. The terminology learned provides a foundation for the study of the preclinical and clinical sciences and enhances effective communication with other healthcare professionals.

Credits: 1. Contact Hours: 15 lect., 1 hr./wk.

PA 30200 - Physical Diagnosis I

Students are introduced to the role of the physician assistant-patient interaction; proper methods of obtaining a comprehensive patient history and performing of comprehensive physical examination and methods of written case presentations utilizing the problem-oriented medical record. Includes supervised small group practicums in the physical examinations.

Credits: 1. Contact Hours: 30 lect., 30 lab, 4 hr./wk.

PA 30300 - Physical Diagnosis II

Students are introduced to the role of the physician assistant-patient interaction; proper methods of obtaining a comprehensive patient history and performing of comprehensive physical examination and methods of written case presentations utilizing the problem-oriented medical record. Includes supervised small group practicums in the physical examinations.

Credits: 1. Contact Hours: 30 lect., 30 lab, 4 hr./wk.

PA 30400 - OB/GYN

Introduction to routine and problem oriented evaluation of the female patient with emphasis on office Gynecology, AIDS, and high-risk pregnancies.

Credits: 1. Contact Hours: 15 lect., 15 lab, 2 hr./wk.

PA 32202 - Pharmacology

Introduction of the general principles of drug actions and characteristics of classes of drugs currently used in primary care practice; drug safety and efficiency; duration of action; potential side effects or adverse reactions; drug interactions; prescription writing; and legal considerations.

Credits: 4. Contact Hours: 60 lect., 30 lab, 6 hr./wk.

PA 32300 - Pathology

This course presents the students with the key concepts of the evolution and expression of disease. The material covered is based upon the clinical importance and heuristic relevance of individual disorders. The lectures are supplemented by computer-assisted instruction.

Credits: 1. Contact Hours: 15 lect., 30 lab, 3 hr./wk.

PA 32400 - Geriatrics

This course introduces the students to the clinical implications of the physiologic changes occurring as a result of the aging process. It also emphasizes the problem with prescriptions and the elderly as well as injury prevention and home visits.

Credits: 1. Contact Hours: 15 lect., 15 lab, 2 hr./wk.

PA 33300 - Pediatrics

Basic introduction to growth and development, well-child care, and evaluation, diagnosis and management of common disorders from conception to young adulthood. Parent education and trauma prevention are stressed.

Credits: 2. Contact Hours: 30 lect., 15 lab, 3 hr./wk.

PA 33400 - Surgery

Introduction to selected common disorders warranting general and surgical subspecialty evaluation including pathophysiology, preoperative management, repair, post-operative management and recovery.

Credits: 2. Contact Hours: 30 lect., 15 lab, 3 hr./wk.

PA 34200 - CML Cluster I

Introduction to fundamental disease processes constructed in units around the major subspecialties of Internal Medicine: Immunology, Infectious Diseases, Dermatology, Rheumatology, Hematology, Oncology, Cardiology, Endocrinology, Nephrology, Pulmonary, Gastroenterology, and Neurology. Integration of knowledge acquired in preclinical sciences with an understanding of clinical signs and symptoms related to common disease entities; process of diagnostic hypothesis generation; and introduction to the principles of patient management and therapeutics. The section on Radiology introduces the student to the concepts of radiation safety, the indications, contraindications and preparations of routine and special studies. While covering nuclear imaging, CT and MRI studies, more than 2/3 of the section is devoted to teaching the student paradigms for reviewing normal radiographs. Also included in this sequence is a section on Dental Issues in Primary Care.

Credits: 2. Contact Hours: 30 lect. 2 hr./wk. and 35 PBL hr./wk.

PA 34300 - CML Cluster II

Introduction to fundamental disease processes constructed in units around the major subspecialties of Internal Medicine: Immunology, Infectious Diseases, Dermatology, Rheumatology, Hematology, Oncology, Cardiology, Endocrinology, Nephrology, Pulmonary, Gastroenterology, and Neurology. Integration of knowledge acquired in preclinical sciences with an understanding of clinical signs and symptoms related to common disease entities; process of diagnostic hypothesis generation; and introduction to the principles of patient management and therapeutics. The section on Radiology introduces the student to the concepts of radiation safety, the indications, contraindications and preparations of routine and special studies. While covering nuclear imaging, CT and MRI studies, more than 2/3 of the section is devoted to teaching the student paradigms for reviewing normal radiographs. Also included in this sequence is a section on Dental Issues in Primary Care.

Credits: 2. Contact Hours: 30 lect. 2 hr./wk. and 35 PBL hr./wk.

PA 34400 - CML Cluster III

Introduction to fundamental disease processes constructed in units around the major subspecialties of Internal Medicine: Immunology, Infectious Diseases, Dermatology, Rheumatology, Hematology, Oncology, Cardiology, Endocrinology, Nephrology, Pulmonary, Gastroenterology, and Neurology. Integration of knowledge acquired in preclinical sciences with an understanding of clinical signs and symptoms related to common disease entities; process of diagnostic hypothesis generation; and introduction to the principles of patient management and therapeutics. The section on Radiology introduces the student to the concepts of radiation safety, the indications, contraindications and preparations of routine and special studies. While covering nuclear imaging, CT and MRI studies, more than 2/3 of the section is devoted to teaching the student paradigms for reviewing normal radiographs. Also included in this sequence is a section on Dental Issues in Primary Care.

Credits: 2. Contact Hours: 30 lect. 2 hr./wk. and 35 PBL hr./wk.

PA 35100 - Gross Anatomy and Embryology

The objective of Gross Anatomy, Embryology, with Organ Imaging is to provide students with hands on experience in the study of the structure and function of the human body, and an understanding of relevant aspects of human development and its abnormalities. Gross Anatomy is explored via regional prosection. Students are expected to examine

anatomic relationships leading to an integration of anatomic function and embryo-fetal development under normal and pathologic conditions.

Credits: 5. Contact Hours: 46 lect., 60 lab hrs. per semester

PA 35300 - Health Promotion & Disease Prevention (HPDP) Clinical Labs

This course emphasizes the role of Physician Assistants in educating patients about disease prevention. Principles of behavioral medicine are taught in conjunction with material on promoting healthy lifestyles.

Credits: 1. Contact Hours: 15 lect., 15 lab, 2 hr./wk.

PA 35400 - Emergency Medicine

The emergency medicine segment focuses on diagnosis, treatment and referral of medical and surgical conditions frequently encountered in the emergency room setting.

Credits: 3. Contact Hours: 3 hr./wk.

PA 36100 - Clinical Correlation I

Students learn the critical thought process necessary for the diagnosis and treatment of clinical problems.

Credits: 1. Contact Hours: 15 lect., 15 lab, 1 hr./wk.

PA 36200 - Clinical Correlation II

Students learn the critical thought process necessary for the diagnosis and treatment of clinical problems.

Credits: 1. Contact Hours: 15 lect., 15 lab, 1 hr./wk.

PA 37100 - Behavioral Science

Basic concepts of mental health, signs and symptoms of mental disorders, methods of gathering data on a patient's mental status, and methods of managing mental health problems in primary care setup. The Department of Psychiatry teaches a sequence in stress management.

Credits: 2. Contact Hours: 30 lect. hrs./sem., 15 lab, 3 hr./wk.

PA 37200 - Interviewing and Counseling

This course focuses on the cultural patterns of communication affecting the clinician-patient relationship and teaches students effective interviewing techniques. Throughout the course, students are expected to apply the concepts and cognitive skills acquired through the Behavioral Science and Physical Diagnosis courses to clinical situations.

Credits: 1. Contact Hours: 15 lect., 15 Problem-Based Learning hours 2 hr./wk.

PA 37400 - Culture, Health and Illness

This course has three broad objectives: 1) To acquaint students with the basic tools, concepts and methods of the social sciences in the study of health, illness and community life, 2) To explore a range of health-related issues such as how cultures adapt to environmental circumstances; how cultural traditions influence the way people feel and express distress, explain their illness, manage misfortune and seek help; and how class, gender and ethnic differences are reflected in patterns of sickness and death, and 3) To introduce the students to the peoples, communities, and contemporary problems of New York.

Credits: 1. Contact Hours: 1 hr./wk.

PA 38100 - Physiology I

Introduction to the study of the biomedical sciences with emphasis on the relationship of structure to function, the sources of energy for life processes, and the quantitative measurement of physiological functions.

Credits: 4. Contact Hours: 60 lect. hr./sem., 4 hr./wk.

PA 38200 - Physiology II

Introduction to the study of the biomedical sciences with emphasis on the relationship of structure to function, the sources of energy for life processes, and the quantitative measurement of physiological functions.

Credits: 4. Contact Hours: 60 lect. hr./sem., 4 hr./wk.

PA 38400 - Health, Law and Economics

This course introduces students to the basic principles of the law as it relates to healthcare and malpractice.

Credits: 1. Contact Hours: 1 hr./wk.

PA 39100 - Microbiology

This course introduces students to the role of bacteria, fungi, viruses, protozoa and parasites in disease, immunity, and public health practice. Emphasis is on clinical applications and basic laboratory diagnostic procedures.

Credits: 4. Contact Hours: 45 lect., 45 lab, 6 hr./wk.

PA 39401 - Epidemiology

This course provides students with a basic understanding of morbidity and mortality rates, incidence and prevalence; the characteristics of persons, place and time as they relate to disease; cohort analysis; risk factors and the calculation of relative risk; and screening methods and the sensitivity and specificity of diagnostic tests. The laboratory exercises with computer applications are field based and designed to give the students practical experience in elements of community health assessment.

Credits: 1. Contact Hours: 15 lect., 20 lab, 2.5 hr./wk.

PA 39402 - Graduate Pairing

This is a continuation of the physical diagnosis course giving students an opportunity to shadow a practicing P.A. in a clinical setting. The student will observe the activities of a senior PA, interview patients, perform focused physical examinations, gain exposure to various medical specialties and acquire the socialization and skills that are pertinent to the profession.

Credits: 1. Contact Hours: 1 hr./wk.

PA 40501 - Physician Assistant National Certifying Examination (PANCE): Clinical Seminars I

The Physician Assistant National Certifying Examination is equivalent to the National Board Examination - Medicine. Physician Assistant students need specific training in Patient Management Protocols, Clinical Therapeutics and Clinical Interventions in their Senior Year. The new course format will allow students to sign-up each semester for a one-credit hour (15 lecture/ laboratory hours) course in Medical Management and will receive a Pass/Fail grade at the end of each semester.

Credits: 1. Contact Hours: 15 lect., 15 lab, 2 hr./wk.

PA 40502 - Physician Assistant National Certifying Examination (PANCE): Clinical Seminars II

The Physician Assistant National Certifying Examination is equivalent to the National Board Examination - Medicine. Physician Assistant students need specific training in Patient Management Protocols, Clinical Therapeutics and Clinical Interventions in their Senior Year. The new course format will allow students to sign-up each semester for a one-credit hour (15 lecture/ laboratory hours) course in Medical Management and will receive a Pass/Fail grade at the end of each semester.

Credits: 1. Contact Hours: 15 lect., 15 lab, 2 hr./wk.

PA 40503 - Physician Assistant National Certifying Examination (PANCE): Clinical Seminars III

The Physician Assistant National Certifying Examination is equivalent to the National Board Examination - Medicine. Physician Assistant students need specific training in Patient Management Protocols, Clinical Therapeutics and Clinical Interventions in their Senior Year. The new course format will allow students to sign-up each semester for a one-credit hour (15 lecture/ laboratory hours) course in Medical Management and will receive a Pass/Fail grade at the end of each semester.

Credits: 1. Contact Hours: 15 lect., 15 lab, 2 hr./wk.

PA 41500 - Emergency Medicine Rotation

This clerkship provides students with practical clinical experience in working in an urban acute care setting. The clerkship helps students develop a focused and systematic approach in diagnosing and treating common medical and surgical emergency problems.

Credits: 3. Contact Hours: 6 weeks or 240 hours at the rotation site. 40 hr./wk.

PA 42500 - Medicine Rotation

This clerkship provides students with practical clinical experience in interpreting and integrating information from a patient's history and physical symptoms in order to reach a diagnosis and formulate a management plan based on general medical knowledge. In addition, students learn the indications and limitations of diagnostic procedures and therapeutic regimens common to internal medicine.

Credits: 3. Contact Hours: 6 weeks or 240 hours at rotation site. 40 hr./wk.

PA 43500 - OB/GYN Rotation

Students gain practical clinical experience in the diagnosis, evaluation and management of normal and abnormal conditions in gynecology and obstetrics. In addition, students learn to provide pre- and post- partum care and counsel to patients on family planning and other concerns.

Credits: 3. Contact Hours: 6 weeks or 240 hours at rotation site. 40 hr./wk.

PA 44500 - Pediatrics Rotation

Students become acquainted with methods of pediatric diagnosis and therapy from birth through adolescence. Emphasis is placed on the diagnosis and management of common childhood illnesses and well-child care.

Credits: 3. Contact Hours: 6 weeks or 240 hours at rotation site. 40 hr./wk.

PA 45500 - Primary Care Rotation

Students in this clerkship gain experience in the effective and compassionate management of the broad spectrum of medical conditions that can be treated in the ambulatory setting. The clerkship emphasizes the importance of providing direct, initial, comprehensive and continuous health care, with a focus on health promotion and disease prevention. Students rotate twice through this clerkship.

Credits: 3. Contact Hours: 6 weeks or 240 hours at rotation site. 40 hr./wk.

PA 46500 - Psychiatry Rotation

This clerkship acquaints students with the diagnosis and management of ambulatory and inpatient psychiatric problems. Students learn to treat both acute and chronic mental health problems as well as affective disorders caused by chemical abuse.

Credits: 3. Contact Hours: 6 weeks or 240 hours at rotation site. 40 hr./wk.

PA 47500 - Surgery Rotation

This clerkship acquaints students with the diagnosis and management of general and subspecialty surgical problems occurring in an ambulatory setting. Students not only learn to assist in surgery, but also gain experience in pre- and post- operative evaluation and management.

Credits: 3. Contact Hours: 6 weeks or 240 hours at rotation site. 40 hr./wk.

PA 48500 - Critical Care/SICU Rotation

Students have an opportunity to participate in the care and management of patients who are critically ill with life-threatening multi-system diseases. Students are exposed to a broad spectrum of invasive physiological monitoring.

Credits: 2. Contact Hours: 4 weeks or 160 hours of clerkship hours at the rotation site. 40 hr./wk.

PA 49500 - Geriatrics Rotation

This clerkship gives students practical clinical experience in the diagnosis and management of common geriatrics medical conditions. Additional emphasis is placed on the rehabilitation techniques and nutritional support appropriate for the elderly patient.

Credits: 2. Contact Hours: 4 weeks or 160 hours of clerkship hours at the rotation site. 40 hr./wk.

PA 49900 - Elective Rotation

This rotation is to expose and educate the P.A. student with clinical experiences with both a pediatric and adult population in Primary Care subspecialty. This rotation entails the development of comprehensive management of a wide variety of common medical problems. All disciplines of medicine are integrated, enabling the student to recognize normalcy and assess its deviations. The student will learn an approach to preventive medicine through the transitions of life - school age, middle age and old age. Preventive care shall be emphasized. The scheduled rotation hours will be determined by the preceptor at the beginning of the rotation and may be subject to change.

Credits: 2. Contact Hours: 4 weeks or 160 hours of clerkship hours at the rotation site. 40 hr./wk.

PHIL - Philosophy Course Descriptions

PHIL 10200 - Introduction to Philosophy

An introduction to some of the central questions of philosophy, concerning our knowledge of the external world, causation, God, mind and body, freedom, justice, and moral judgment, via analysis of classical and contemporary philosophers such as Plato, Aristotle, Descartes, Locke, Hume, Mill, Kant, Russell, Wittgenstein and Rawls.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 11100 - Critical Thinking

An informal analysis of inference and evidence employed in everyday arguments, including study of the principles held to justify forms of argument in morality, politics, the law and aesthetics. The aim of the course is to develop critical skills in reasoning and the evaluation of arguments, and sensitivity to the distinction between substantive argument and persuasive rhetoric, through a detailed analysis of examples drawn from a wide variety of sources, including the media. Attention will be paid to some elementary but critical distinctions relating to meaning, definition, and implication.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 11104 - Critical Thinking

Students will study of the role of evidence and inference. Special emphasis is given to developing skills in reasoning and the appraisal of arguments. Arguments in the sciences, social sciences, law, and politics will be considered.

Credits: 4. Contact Hours: 4hr/wk

PHIL 11200-12000 - Special Topics in Philosophy

Selected topics and experimental courses are offered on a variety of topics. No prerequisites.

Credits: Variable cr..

PHIL 11250 - Scientia: the Unity of Knowledge

Is knowledge one type of thing, or a number of different things? Does it make sense to integrate scientific, mathematical, humanistic and artistic knowledge? If so, how do we do that while respecting the distinctive contributions of each field? We will explore what knowledge is and how we make sense of it.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 20100 - Logical Reasoning

This course provides students with an introduction to the elements of logical reasoning. Basic rules and methods of assessing validity and proving arguments as they occur in natural language are introduced (such as truth tables and rules of inference). The goal of the course is to enable students to translate and evaluate arguments in natural language using the basic tools of modern logic. The focus of this course enables it to serve as an excellent form of preparation for SATs, LSATs and other standardized tests, as well as an analytic resource for further academic studies.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 20200 - Introduction to Logic

This course introduces students to the basics of modern logic. Topics covered include truth-tables, the rules of inference for the propositional calculus, and introduction to quantification theory. It focuses both on rules for producing formal proofs, and for translating natural language arguments into logical notation. Primarily designed as a preparation for advanced logic (PHIL 32100: Symbolic Logic), the course would also be very useful for anyone expecting to deal extensively with complex reasoning.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 20600 - Philosophy of Science Fiction

An analysis of some of the central questions of philosophy as they are represented in science fiction (and occasionally, science fact). Selections from science fiction works will range over topics such as space and time, infinity and eternity, identity, knowledge of other minds; artificial intelligence; moral dilemmas and technology; the meaning of life.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 30001 - The Rational Animal: Honors

A critical analysis of the nature and relationships between a variety of intellectual disciplines (such as the natural and social sciences, humanities and education) and of a number of contemporary, philosophical problems relating to mind, self and consciousness, and authority, rights and responsibilities. For Honors students only.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 30100-30400 - Honors I-IV

Approval of Dean and Department Honors Supervisor required. Apply no later than December 10 in the Fall term or May 1 in the Spring term.

Credits: variable credit, but usually 3 cr./sem..

PHIL 30500 - History of Philosophy I: Ancient

A survey of early Greek philosophy, centered on the figures of Socrates, Plato, and Aristotle. Some attention is paid to pre-Socratic philosophers (e.g. Heraclitus, Parmenides) and to at least one current of thought after Aristotle (e.g. Stoicism, Skepticism, neo-Platonism, or early Christian theology).

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 30600 - History of Philosophy II: Modern

The formulation of the subjects and methods of modern philosophy in the seventeenth and eighteenth centuries. Rationalism: Descartes, Spinoza, Leibniz. Empiricism: Locke, Berkeley, Hume. Transcendental idealism: Kant. Topics include the human mind, free will and determinism, knowledge of the external world and God.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 30700 - Metaphysics and Epistemology

A survey of classic problems and contemporary theories of reality and knowledge. Includes topics such as appearance and reality; substance and accident; the relation between mind and body; causation; freedom and determinism; the relation between knowledge, belief, and certainty; skepticism, solipsism, relativism, and reliabilism.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 30800 - Ethics

Analysis of the concepts employed in moral reasoning, such as good, right, duty, obligation, virtue, freedom and choice. Critical study of various theories of moral justification-such as utilitarianism, deontological ethics, virtue ethics-and of status of moral judgments-such as subjectivism, objectivism, relativism and skepticism. The relation between morality and religion, moral dilemmas, and some problems in practical ethics (abortion, famine, the environment, etc.).

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 30804 - Ethics

Analysis of the concepts employed in moral reasoning, such as good, right, duty, obligation, virtue, freedom and choice. Critical study of various theories of moral justification-such as utilitarianism, deontological ethics, virtue ethics, and of the status of moral judgments such as subjectivism, objectivism, relativism, and skepticism is encouraged. The relation between morality and religion, moral dilemmas, and some problems in practical ethics (for example: abortion, famine, the environment) are considered.

Credits: 4. Contact Hours: 4 hr./wk.

PHIL 30900 - Social and Political Philosophy

An analysis of the concepts and principles employed in reasoning about the social and political aspects of human life, such as social structure and function, equality and justice, property and rights, social and political obligation. A critical analysis of theories of the state of society, such as liberalism, Marxism, communitarianism, conservatism, and anarchism.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 31000 - Independent Study and Research

A planned program of reading in philosophy to meet special needs of individual students, under guidance of a member of the department. Limited to upper seniors able to take a course before graduation when needed for graduate preparation. For advanced or specialized work beyond available offerings already completed. Permission of instructor required before registration.

Credits: Variable credit, but usually 3 cr./sem..

PHIL 31100-32000 - Special Topics in Philosophy

Special and experimental courses offered on a variety of topics. Consult Department for offerings and prerequisites.

Credits: variable credit, but usually 3 cr./sem..

PHIL 31404 - Philosophy & Film

Credits: 4. Contact Hours: 4 hours

PHIL 32100 - Symbolic Logic

This course extends the work of PHIL 20200. The focus is on rigorously formulated systems of propositional and predicate logic, with emphasis

on theorem-proving and the formalization of natural-language reasoning. Attention will be paid to the theory of relations, definite descriptions, the translation of elementary arithmetical concepts into logic and proofs of the deductive completeness of various systems of logic.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHIL 20200.

PHIL 32200 - Philosophy of Science

A critical survey of philosophical theories of scientific explanation and development. The course will focus on topics such as inductive and hypothetico-deductive accounts of scientific method; confirmation and falsification of scientific theories; the logic of scientific explanation; theories and models; the structure of scientific revolutions.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 32300 - Philosophy of Mind

Examination of some classical and contemporary problems relating to our concepts and theories of mind, and of psychological phenomena such as intelligence, rationality, and emotion. Topics are likely to include theories of the relation between mind and brain (varieties of dualism and materialism); self-knowledge and knowledge of other minds; psychopathology; artificial intelligence; and personal identity.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 32400 - Philosophy of Language

Examination of the relationship between thought, language and the world. The course will cover topics such as meaning, truth, reference, synonymy, necessity, names and descriptions, logical form, and pragmatics.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 32500 - Aesthetics: The Philosophy of Art

The philosophical study of art, and of our judgment of art, through classical readings and contemporary developments. Includes topics such as representation, taste, artist intention, and mechanization. Special attention is paid to the problem of trying to speak generally about art in the face of the differences among specific arts.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 32600 - Philosophy of Law

A critical analysis of some central concepts employed in legal reasoning and judgment, such as justice, crime, evidence, responsibility, legal and civil rights, punishment, civil disobedience, and constitutional interpretation. Examination of major theories of law such as natural law theory, legal positivism and social realism, and of the relation between the law and morality.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 32700 - Philosophy of Religion

Critical analysis of the question: What is religion? in light of the variety of religious beliefs and practices. Examination of different approaches to religion, including faith, rational argument, sensory experience, mystical and religious experience. Exploration of the relation between faith and reason, and between morality and religion.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 32800 - Philosophy of Social Science

Critical analysis of the concept of the social as it is employed in classical and contemporary social scientific theories of social action, social structure, social collectivity and social explanation. Attention will be paid to topics such holism and individualism; social and psychological explanation; structural and functional explanation; rationality assumptions; understanding alien societies; theories and values in social science; and the autonomy of historical understanding.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 32900 - Philosophy of History

A survey of some classical and contemporary problems in both speculative and analytical philosophy of history. The course focuses on topics such as general theories of history (Vico, Kant, Herder, Hegel, Marx, Toynbee); varieties of historical explanation; objectivity in history; concepts of causation in history; methodology; history as an autonomous discipline.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 33400 - Philosophy of Artificial Intelligence

Addresses philosophical issues raised by computers and other machines capable of performing tasks indicative of intelligence (e.g. multiplication, logical reasoning, playing chess, learning a language). The course will focus on topics such as the Turing test; strong and weak AI; concepts of representation, memory and understanding; the frame problem; symbolic versus connectionist approaches to cognitive processing.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 33500 - Philosophy of Film

Addresses philosophical issues relating to film, such as the status of film as art object; the role of the audience in the constitution of the film object; realism and surrealism in film; and particular film genres such as comedy and cinema noire.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 33600 - Philosophy of Space and Time

Addresses philosophical questions raised by our employment of the concepts of space and time in science and metaphysical thinking. The course will focus on topics such as individuation and spatio-temporal continuity; unities of space and time; substantial and relational theories of space; asymmetries of time; the theory of relativity; infinity and eternity.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 33700 - Decision Theory

A non-mathematical introduction to game theory, decision theory, and rational choice theory, and philosophical issues relating to probability theory and utility theory. Includes examination of problems and paradoxes such as the Prisoner's Dilemma, Newcomb's problem and Cohen-Kelly queuing paradox.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 33800 - Philosophy of Wittgenstein

Critical explanation and analysis of the philosophy of Ludwig Wittgenstein, with special focus on his controversial and influential views on language, reality and forms of life, and their implications for disciplines such as linguistics, psychology, literary criticism and feminist theory.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 33900 - Kierkegaard, Nietzsche, Freud

A study of three authors who helped to define modernism after Hegel. The course focuses on: the philosophical critique of philosophy; the new quest for authentic individuality; reassessments of religion.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 34000 - Self and Identity

A study of major philosophical theories of self-knowledge and personal identity, and related literary, social and psychological theories.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 34100 - Philosophy of Psychoanalysis

Critical analysis of central concepts of Freudian and post-Freudian psychopathology and psychotherapy.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 34400 - World Philosophies

Addresses central concepts and principles of a variety of non-Western systems and traditions in philosophy. Courses offered are likely to include (but are not restricted to) African Philosophy; Chinese Philosophy; Indian Philosophy; Islamic Philosophy; Latin- American Philosophy. Different systems and traditions will be offered in different semesters.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 34500 - American Philosophy

Addresses central themes of American Philosophy, through the work of authors such as Edwards, Emerson, James, Pierce, Dewey, Quine, Putnam, and Rorty.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 34600 - Feminist Philosophy

Charts the historical evolution of the feminist approach to philosophy, and the contribution of feminists to topics in epistemology, philosophy of mind and moral, social and political philosophy.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 34700 - Contemporary Philosophy

A study of major philosophical theories and theorists of the late nineteenth and twentieth century. The focus of this course may vary in different semesters, with emphasis placed upon either analytical, pragmatist or continental theories and theorists.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 34800 - Continental European Philosophy

A study of major concepts and principles of philosophical movements originating in Continental Europe, such as Phenomenology; Existentialism; Hermeneutics; and Critical Theory.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 34900 - Applied Ethics

Critical analysis of moral issues and dilemmas as they arise in various professions and everyday situations. Courses offered are likely to include (but are not restricted to): Business Ethics; Computer Ethics; Engineering Ethics; Environmental Ethics; Medical Ethics; Psychological Ethics. Different course topics will be offered in different semesters.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 34902 - Computer Ethics

Credits: 3. Contact Hours: 3 hours

PHIL 34905 - Biomedical Ethics

Biomedical Ethics is a philosophical overview of leading theories, principles, and problems in the field of bioethics. Ethical theories and principles are examined to provide a theoretical structure for analysis of concrete ethical problems. The course considers the ethics of the doctor-patient relationship, including paternalism, informed consent, confidentiality, and truth telling, as well as larger systemic issues of social justice and access to health care. Topics in reproductive ethics, end-of-life ethics, and some of the newest developments in the field arising from genetics and neuroscience are also discussed. Extensive use is made of case studies.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 35000 - Major Philosopher(s)

Intensive study of the work of major philosophers (such as Plato, Hume, Kant, Hegel). Different philosophers featured in different semesters.

Credits: 3. Contact Hours: 3 hr./wk.

PHIL 35400 - Seminar in Advanced Topics in Philosophy

Topics selected from a variety of different areas are made the focus of intensive critical examination. Topics offered each semester will be listed by the Philosophy Department. Prerequisites stated with course descriptions. Intended primarily for philosophy majors.

Credits: 3. Contact Hours: 2 sem. hr./wk. plus conference

PHYS - Physics Course Descriptions

PHYS 10000 - Ideas of Physics

A course with two themes: 1. How nature works the interplay of space, time, matter and energy; 2. Structures are born, live out their life cycles, and die. These include us, the stars, and perhaps the universe. This theme may be called the scientific story of genesis.

Credits: 3. Contact Hours: 3 lect., 1 rec. hr./wk., demonstrations, slides, films

PHYS 20400 - General Physics II

For majors in the life sciences (biology, medicine, dentistry, psychology, physical therapy) and for liberal arts students. Fundamental ideas and laws of physics from mechanics to modern physics. Included are Newton's laws of motion, electricity and magnetism, heat, optics, relativity, quantum mechanics and nuclear physics. Emphasis is on the basic principles and general laws. Use of mathematics is restricted to elementary algebra and some trigonometry. PHYS 20300 is prereq., for PHYS 20400 (required for Premed., Preident., Bio-Med., and all Life Science students).

Credits: 4. Materials Fee: \$10. Contact Hours: 3 lect., 2 rec., 2 lab. hr., 4 cr./sem. Prerequisite: PHYS 20300

PHYS 20300 - General Physics I

For majors in the life sciences (biology, medicine, dentistry, psychology, physical therapy) and for liberal arts students. Fundamental ideas and laws of physics from mechanics to modern physics. Included are Newton's laws of motion, electricity and magnetism, heat, optics, relativity, quantum mechanics and nuclear physics. Emphasis is on the basic principles and general laws. Use of mathematics is restricted to elementary algebra and some trigonometry. PHYS 20300 is prereq., for PHYS 20400 (required for Premed., Preident., Bio-Med., and all Life Science students).

Credits: 4. Materials Fee: \$10. Contact Hours: 3 lect., 2 rec., 2 lab. hr., 4 cr./sem.

PHYS 20305-20405 - Laboratory Sections for 20300 and 20400

Department permission required for registration, which is limited to students having passed lecture part via exemption exam or via equivalent course elsewhere. Not open to students who have previously taken or are planning to register for PHYS 20300 or PHYS 20400.

Credits: 1. Contact Hours: 3 lab. hr. alt. wks.; 1 cr./sem.

PHYS 20700 - University Physics I

Calculus based introductory physics course covering: vectors, kinematics, Newton's laws, equilibrium, gravitation, motion in a plane, work and energy, impulse and momentum, rotation and angular momentum, simple harmonic motion, fluids, heat, and thermodynamics.

Credits: 4. Materials Fee: \$10. Contact Hours: 3 lect., 2 lab/wrkshp. hr. Prerequisite: or coreq.: MATH 20200 for PHYS 20700. PHYS 20700 is prereq. (Required for all students in the Physical Sciences, Engineering and Computer Science.)

PHYS 20800 - University Physics II

Vectors, equilibrium, rectilinear motion. Newton's laws, gravitation, motion in a plane, work and energy, impulse and momentum, rotation and angular momentum, simple harmonic motion, fluids, heat and thermodynamics, waves and acoustics, electrostatics, magnetism and

electromagnetism, direct and alternating current, geometrical and physical optics. Vectors, equilibrium, rectilinear motion. Newton's laws, gravitation, motion in a plane, work and energy, impulse and momentum, rotation and angular momentum, simple harmonic motion, fluids, heat and thermodynamics, waves and acoustics, electrostatics, magnetism and electromagnetism, direct and alternating current, geometrical and physical optics.

Credits: 4. Materials Fee: \$10. Contact Hours: 3 lect., 2 rec. hr./wk., 2 lab/wrkshp. hrs Prerequisite: PHYS 20700 and MATH 20300

PHYS 20900 - General Physics: Waves, Optics and Modern Physics

Calculus-based study of the basic concepts of wave motion, physical optics, and modern physics. Topics include: Wave equation, Electromagnetic Waves, Dispersion; Interference, Diffraction, Polarization; Special Theory of Relativity; Particle properties of Waves, Photoelectric Effect, Compton Effect; Wave Properties of Particles, Wave-particle duality; The Nuclear Atom, Bohr Model, Franck-Hertz Experiment; The Schrodinger Equation, Harmonic Oscillator, Hydrogen Atom; Atomic Physics; Molecular Structure and Atomic Spectra; Structure of Solids, Conduction; Nuclear Physics, Nuclear Structure, Nuclear Force, Radioactivity.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: PHYS 20700, PHYS 20800 and MATH 20300. Corequisite: None.

PHYS 21900 - Physics for Architecture Students

A one-semester course for students of Architecture. Translational and rotational equilibrium. Newton's laws of motion and vibrations. Work, energy and power. Fluids and temperature. Heat and energy transfer.

Credits: 4. Contact Hours: 3 lect., 2 rec. hr./wk. Prerequisite: Completion of all mathematics requirements through trigonometry or be eligible for MATH 20500.

PHYS 30000 - Elementary Physics

For students in the School of Education. Survey of physics emphasizing the meanings of physical laws, concepts of motion and energy, and physical properties of matter. Topics include concepts of velocity and acceleration; Newton's laws of motion, mass and weight, circular motion, gravitation, work, energy, momentum, electromagnetic properties of matter, and atomic theory (required for students in Elementary Education).

Credits: 3. Contact Hours: 3 lect., 2 lab. or discussion hr./wk.

PHYS 30100-30300 - (Honors I-III): Research Honors Program

The Research Honors Program is one of several ways for undergraduate students to participate in faculty research projects. Such projects, if judged to be of sufficient quality and quantity, may lead to a degree with Research Honors. A written report by the student is required every semester. Students presentation of the results of their work is required at the Honors and Independent Study symposium in the spring of their senior year. In order to graduate "with Research Honors", the student must maintain a "B" average or better in the major subject, submit an Honors paper which is a report in research publication format, and be given a minimum of 6 credits of "A" for this work by the mentor. The student's Research Mentor will provide a written document certifying that the student has fulfilled the criteria established for graduating with Research Honors.

Credits: variable credit, usually 3 cr./sem. Contact Hours: TBA hr./wk.. A maximum of 12 credits of honors courses count toward the degree. Prerequisite: Approval of Dean and Department Honors Supervisor is required and should be obtained in the semester prior to the one in which the work will be performed. A "B" average or better in major courses is required in order to take Honors (or Independent Studies) courses.

PHYS 31000 - Independent Study

The student will pursue a program of independent study under the direction of a member of the Department with the written approval of the faculty sponsor and the Department Chair. Credit may be from 1-4

credits, as determined in the semester before registration by the instructor with the approval of the Department Chair. Students must have completed at least nine credits with a GPA of 2.5 or higher. A maximum of nine credits of independent study may be credited toward the degree. Independent study is to be used to meet special student needs that are not covered in regular course offerings.

Credits: 1-4.

PHYS 31100-32000 - Selected Topics in Physics

Courses on contemporary topics to be offered according to the interest of faculty members and students. Consult Department for courses to be offered each academic year.

Credits: 3. Contact Hours: 3 hr./wk.

PHYS 31500 - Medical Physics

Physical aspects of the skeletal, circulatory, nervous, muscular, respiratory, and renal systems; diagnostic imaging including EKG, EEG, x-rays, CAT, MRI, lasers and fiber optical probes; radiation therapy and safety; nuclear medicine; artificial organs.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 20400 or PHYS 20800.

PHYS 32100 - Modern Physics for Engineers

Introductory historical background, elementary quantum theory, application to one-electron atoms, atomic shell structure and periodic table; nuclear physics, relativity and statistical mechanics. Concepts, quantitative work and problem sets are emphasized.

Credits: 3. Contact Hours: 3 lect. hr./wk. Prerequisite: PHYS 20800 or equivalent, MATH 20300 or MATH 20900 (elective for Engineering students).

PHYS 32300 - Quantum Mechanics for Engineers

Basic experiments, wave-particle duality, uncertainty. Wave functions and Schroedinger equation. 1-d problems, bound states, square well, harmonic oscillator, scattering from barriers, tunneling. QM formalism, Dirac notation, operators & eigenvalues, angular momentum. Hydrogen atom. Perturbation theory first order nondegenerate, level splitting. Time-dependent PT, Golden rule, spin. Quantum communication, Bell's theorem.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 20700 and PHYS 20800, MATH 39100 and MATH 39200.

PHYS 33100 - Intelligent Life in the Universe

Problems concerning the existence of and contact with other intelligent life forms. The physical conditions necessary for development and evolution of such forms. The physical limitations on contact with them.

Credits: 4. Contact Hours: 4 hr./wk.

PHYS 33200 - Physics of Science Fiction

The physical basis for the many imaginative and speculative schemes encountered in science fiction: anti-matter, space warps, black holes, anti-gravity, time travel, multi-dimensional universes, parallel universes, quarks, robots, flying saucers, Star Trek, etc. Every lecture is accompanied by a color slide show. No prereq.

Credits: 3. Contact Hours: 3 hr./wk.

PHYS 33300 - Development of Knowledge in Physics I

Selected topics in physics with emphasis on gaining a depth of understanding of the subject matter and an awareness of the development of skills essential to the scientific process. Course content focuses on contexts of force, motion, and the behavior of the sun, moon and stars. Background for teaching science in secondary schools or introductory college level with introduction to Physics Education Research. Integrated laboratory / discussion format.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 20900 or PHYS 32100.

PHYS 33400 - Development of Knowledge in Physics II

Selected topics in physics with emphasis on gaining a depth of understanding of the subject matter and an awareness of the development of skills essential to the scientific process. Course content focuses on contexts of geometrical optics, waves, physical optics, the particulate nature of light, properties of the atom, and wave particle duality. Background for teaching science in secondary schools or introductory college level with introduction to Physics Education Research. Integrated laboratory / discussion format.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 20900 or PHYS 32100.

PHYS 35100 - Mechanics

Newton's laws; Systems of particles; Small oscillations; Central forces and planetary motion; Rotations and rotating coordinate system; Introduction to rigid body motion; Lagrangian dynamics; Introduction to Hamiltonian dynamics.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: PHYS 20800; pre- or core req.; MATH 39100 (required for Physics majors).

PHYS 35300 - Electricity and Magnetism I

Review of vector calculus; Electrostatics in vacuum, work & energy, conductors; Laplace's equation and its solution; Electric fields in matter, currents, circuits and dielectrics; magnetostatics, vector potential.

Credits: 3. Contact Hours: 3 hr./wk.

PHYS 35400 - Electricity and Magnetism II

Selected topics in physics with emphasis on gaining a depth of understanding of the subject matter and an awareness of the development of skills essential to the scientific process. Course content focuses on contexts of geometrical optics, waves, physical optics, the particulate nature of light, properties of the atom, and wave particle duality. Background for teaching science in secondary schools or introductory college level with introduction to Physics Education Research. Integrated laboratory / discussion format.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 35300; pre- or coreq.: MATH 39100 and MATH 39200 (required for Physics majors, except those in the Biomedical Option).

PHYS 55200 - Quantum Physics II

Formalism of quantum mechanics: observables, operators; application to simple cases: two-level systems, electron in a magnetic field, spin; time-independent and time-dependent perturbation theory with applications; adiabatic processes; selected topics in atomic, optical, solid-state, nuclear and particle physics; quantum entanglement, Bell's theorem and recent experiments.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 55100 or equivalent MATH 39100, and MATH 39200 (required for Physics majors).

PHYS 55400 - Solid State Physics

(Same as PHYS U4500) Crystal structure and symmetry; crystal diffraction; crystal binding; phonons and lattice vibrations; thermal properties of insulators; free electron theory of metals; energy bands; Fermi surfaces; semiconductors, selected topics in superconductivity, dielectric properties, ferro-electricity, magnetism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 55100 or equivalent, e.g. CHEM 33200 or PHYS 32100 (elective for Physics and Engineering majors).

PHYS 55500 - The Physics and Chemistry of Materials

(Same as PHYS U4600) Examples, characteristic properties, and applications of important classes of materials (semiconductors, ceramics, metals, polymers, dielectrics and ferroelectrics, superconductors, magnetic materials); surfaces and interfaces of solids; selected topics in the synthesis, processing and characterization of materials.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 55400 or equivalent, e.g. EE 45400 (required of Physics majors in the Applied Physics/Material Science Concentration, and elective for other Physics majors and for Engineering majors).

PHYS 55600 - Current Topics in Physics

A seminar course on current topics in experimental and theoretical physics, with oral reports by students and faculty (required for Physics majors).

Credits: 1. Contact Hours: 1 hr./wk.

PHYS 56100 - Materials Science Laboratory

Introduction to some of the basic methods for sample preparation and characterization relevant to materials science. Topics include synthesis of semiconductor thin films and high temperature superconductors, contact preparation, measurements of transport properties as a function of temperature, Raman spectroscopy, electron spin resonance (ESR), X-ray diffraction, absorption measurements in UV-visible range.

Credits: 4. Contact Hours: 4 lect. hr./wk. for the first three wks., then 7 lab. hr./wk. Prerequisite: PHYS 32300 Corequisite: PHYS 55400 or permission of the instructor.

PHYS 58000 - Physical Photonics II

(Same as PHYS U6800) Three-level and four-level solid state lasers: ion-doped laser crystals and glasses. Solid-state laser engineering: end-pumping techniques. Laser characterization: limiting slope efficiency. Femtosecond pulse generation: synchronous pumping, active mode-locking of tunable solid-state lasers. Regenerative amplification of ultrashort pulses. Photons in semiconductors: light-emitting diodes and semiconductor lasers. Semiconductor-laser-pumped solid-state lasers; microchip lasers. Photon detectors; noise in photodetectors. Polarization and crystal optics: reflection and refraction; optics of anisotropic media; optical activity and Faraday's effect; optics of liquid crystals; polarization devices. Electro-optics: Pockel's and Kerr effects; electro-optic modulators and switches; spatial modulators; photo-refractive materials. Nonlinear optics: frequency mixing and harmonic generation; optical solutions. Acousto-optics: interactions of light and sound; acousto-optic devices.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 45300.

PHYS 58100 - Physical Photonics III/Wave Transmission Optics

(Same as PHYS U8100) Waves and Maxwell's equations. Field energetics, dispersion, complex power. Waves in dielectrics and in conductors. Reflection and refraction. Oblique incidence and total internal reflection. Transmission lines and conducting waveguides. Planar and circular dielectric wave-guides; integrated optics and optical fibers. Hybrid and linearly polarized modes. Graded index fibers. Mode coupling; wave launching. Fiber-optic communications: modulation, multiplexing, and coupling; active fibers: erbium-doped fiber lasers and amplifiers.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PHYS 35300 and PHYS 35400.

PORT - Portuguese Course Descriptions

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which is numbered 123, 124 and 226.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

PORT 12300 - Introductory Portuguese I

An introductory course using a communicative approach to develop conversational skills and provide the student with a foundation in Portuguese grammar, pronunciation and vocabulary.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

PORT 12400 - Introductory Portuguese II

A continuation of Portuguese 12300 using a communicative approach to develop conversational skills and provide students with further study of Portuguese grammar, pronunciation and vocabulary.

Credits: 3. Contact Hours: 4 hr./wk. plus one hr. at the Language Media Center Prerequisite: PORT 12300 or placement.

PORT 22600 - Intensive Intermediate Portuguese

A one-semester Portuguese course at the intermediate level. This course will review the grammar of the Portuguese language, enhance vocabulary, and will include literary and cultural readings. It will further develop listening, speaking, reading comprehension, and writing skills through class discussions and the use of multimedia and the Internet.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: PORT 12400 or placement examination.

PORT 32100 - Reading and Writing in Portuguese I

Lays the foundations for students' further understanding of grammar and different forms of expository and analytical writings in Portuguese. The short stories studied in this course address topics such as the representation of national self-identity, slavery, the indigenous, Afro-Brazilian and immigrant cultures, the Lusophone diaspora, gender, and regional differences encountered throughout Portuguese speaking countries. Readings and class discussions in Portuguese.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: PORT 22600 or scoring at the exempt level.

PORT 32200 - Reading and Speaking in Portuguese II

Practice in oral expression with an emphasis on developing conversational skills (pronunciation, comprehension, and oral expression), and cultural knowledge. Provides intense practice of the spoken language through comprehension of Lusophone texts, films, and current events. Readings and class discussions in Portuguese.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: PORT 22600. Corequisite: PORT 32100.

PORT 40100 - Selected Topics in Luso-Brazilian Literatures and Cultures

Offers an overview of the development of Luso-Brazilian literature from its origins to contemporary times. Includes a study of the social, cultural, and political developments of Brazil and Portugal. The study of literature written in Portuguese acquaints students with the influential role played by Portugal during the Age of Discovery. It deepens the students' appreciation and enjoyment of fine literature in Portuguese through reading selections by leading authors. Studies the contribution of Native, Iberian and African cultures, the development of the arts, the impact of revolutionary movements, and the place of minorities today.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: PORT 32100 and PORT 32200.

PORT 40200 - The Cultures and Literatures of Lusophone Africa

A survey of the post-colonial literature of Lusophone Africa. Topics include the struggle for independence, geography, folklore, development of the arts, ideology, socio-political changes and social issues. A unit for each Lusophone country features film analysis, poetry, short stories, novels, and literary criticism and theory.

Credits: 3. Contact Hours: 3hr./wk. Prerequisite: PORT 32100 and PORT 32200.

PSC - Political Science Course Descriptions

PSC 10104 - U S Politics & Govt

Credits: 4. Contact Hours: 4 hours

PSC 12500 - Introduction to Public Policy

Public policy encompasses much of governmental and even non-governmental activity. This course introduces students to the problems of bounding the phenomenon of public policy and of understanding the policy process, including agenda-setting, problem-definition, policy evaluation, and public accountability.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 12504 - Introduction to Public Policy

This is a course in what governments do in political, social and economic contexts. Models of the formulation, legitimation and implementation of domestic policies in areas such as health, welfare, education, civil rights, and the environment are examined.

Credits: 4. Contact Hours: 4hr/wk

PSC 12600 - Introduction to the Legal Process

The basic institutions, procedures and theory of the administration of justice. Students examine typical proceedings, civil and criminal, and the operation of administrative as well as judicial tribunals. The legal process in relation to the American political system.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 20200 - Comparative Political Economy

An examination of the relationship between political and economic systems in selected industrialized and developing countries. Introduction to theories of political economy as they apply at the domestic and international levels. Preparation for advanced courses dealing with applications of such theories in particular problem or area settings.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: INTL 20100 or PSC 12200.

PSC 20700 - The Politics of Criminal and Civil Justice

The uses and limitations of law as a vehicle for achieving and securing a just political and social order. Special attention to the persistence of

discrimination and inequality in the establishment and operation of legal systems.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 20800 - American Political Thought

The origins and development of American political thought from the Puritan times to the end of the Civil War. The course will include study of basic themes in American thought: the scope and bounds of legitimate government power, majority rule and minority rights, federalism and centralization, participatory democracy, checks and balances, religious freedom and separation of church and state. Also counts as a political theory and philosophy course.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 20900 - Amer Pol Thought 2

The development of American political thought from the end of the Civil War to the present. The course will include study of major political issues emergent since Reconstruction: race and gender issues, immigration, urbanization, multiculturalism, business-government relations, management of the American economy, and America's relationship to the world. Also counts as a political theory and philosophy course.

Credits: 3. Contact Hours: 3 hours

PSC 21000 - Urban Politics

The politics and policy problems of urban areas throughout the United States. Emphasis on both the central cities and their suburbs, as well as their relationships to state governments and national institutions.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 21002 - Politics and Leadership

The dynamics and dilemmas of leadership and power. Various definitions of politics and systems of government will be related to current political controversies. Use of case studies, novels, films, essays, and other materials to illustrate political processes and concepts. Satisfies requirements of discipline-based writing course.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 21200 - Constitutional Law

Survey of the historical and political role of the Supreme Court, focusing on leading decisions. These deal with central problems of judicial review and democracy, the federal system, and the scope and limits of congressional and presidential power.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 21300 - Civil Liberties

The conflicts between majority rule and minority rights in leading Supreme Court decisions. Major attention to the more recent decisions concerning freedom of speech, freedom of religion, and other civil liberties, as well as social legislation and regulation of business.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 21304 - Reinventing Freedom

Analyzes the major writings of the Enlightenment, the century that has done more than any other to shape the current sense of modernity and freedom, particularly in the American people. In dealing with questions regarding belief and the place of religion in a politically just society; regarding the justification for political obedience and the legitimation of political order; regarding economic justice and how it can be achieved; and regarding the place and possibilities for women in the modern world, students realize that this era marks the reinvention of freedom that has catapulted us into the modern age.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 21600 - Political Parties and Interest Groups

Interest groups and pressure politics. The rise of new groups in the political process. The nature and functions of parties under the

American system of government; major and minor parties; party finance and political machines; national campaign issues and techniques.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 21700 - Mass Media and Politics

The political questions raised by the growth, methods and technology of the mass media. Includes exploration of alternative theories of communication; the development of special media-oriented social roles and events; and the relationship between mass communication, symbolic politics, and political behavior at both the individual and societal level.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 21800 - Early American Political Development

Early American Political Development studies the institutional, intellectual, legal, and political development of the United States from the late colonial era through the time of Abraham Lincoln. The questions at this course's focus are: "Are we to be a nation?" and "What kind of nation are we to be?" The course examines a wide range of primary sources – including constitutions, laws, examples of political argument, and other documents – and a sampling of the best, most up-to-date scholarship.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 21900 - African-American Political Thought

African American Political Thought studies the evolution of and contributions to political thought by African Americans from the early nineteenth century to modern times. Questions at this course's heart include: What is the relationship between African American political thought and American political thought? What challenges does African American Political Thought pose for the American experiment and for such components of that experiment as the rule of law?

Credits: 3. Contact Hours: 3 hr./wk.

PSC 22000 - The Judiciary

How courts function in the political system. Examination of the motivations of judges, the social and cultural contexts of courtroom behavior, and role of the judiciary in policy-making.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 22100 - The Congress

An examination of the role of legislative bodies in our political system. Organization, procedures and operations are the focus of the course. Case studies dealing with contemporary policy-making are integrated throughout the semester.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 22200 - The Presidency

Assessment of the present and possible future role of the American presidency. The development of the office, its relationship to other institutions and politics, and contemporary problems. Topics include the duties of the President as Chief Executive, legislator, shaper of foreign policy, Commander-in-Chief, party leader, and head of state.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 22300 - United States Foreign Policy

This course will examine the nature and instruments of American foreign policy with the aim of equipping the student with the tools to make his/her own evaluation. Emphasis will be on the interplay between "ideas" and "reality" in this nation's approach to the outside world. Current foreign policy issues will be thoroughly examined. Also counts as an International Relations course.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 22600 - Ethnic and Racial Politics in the United States

Detailed examination of cooperation and conflict among various ethnic groups. Particular attention will be paid to such topics as busing, affirmative action, neo-conservative thought, and comparative ethnic issues.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 22800 - Policy Analysis

Designed to provide practical insights into the use of technical information and technical skills in the legislative and administrative processes of government. Designed especially for students in the School of Engineering and Architecture, this course is open by permission of the instructor to other interested students.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 22900 - Women and Politics

This course explores the theoretical underpinnings of contemporary feminism and analyzes the changing dimensions of women's participation in American politics. Electoral, interest group, and elite level political involvement will be discussed and comparisons made with women's political role in other nations.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 23000 - Contemporary Comparative Politics

The basic problems of comparing different types of political systems and their institutions. Specific examples are taken from American, western European and the Communist experience, as well as from cases drawn from the developing world.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 23100 - Political Systems of Europe

Political processes in European countries viewed in terms of historical influences and contemporary social structure, and in comparison with American experience..

Credits: 3. Contact Hours: 3 hr./wk.

PSC 23500 - Introduction to the Politics of Developing Nations

Analysis of theories of development and their application in particular to the nations of the global south, the political, social and economic problems of developing countries, with particular emphasis on public policy choices. International economic influences (problems of foreign aid, trade and investment) as well as domestic influences on policy are discussed.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 23600 - Political Systems of Latin America

Contemporary political systems in selected countries. Emphasis upon the cultural environments, constitutional foundations, and practices, political and administrative patterns, political instability and revolution, the role of the family, church, army, intellectual and caudillo, and the relations of these governments with each other and the world.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 23800 - Political Systems of Africa

This course provides a broad overview of African politics. It does so in two ways. First, it gives a broad political history of the African continent from pre colonial times until the present, with a particular emphasis on the postcolonial period. Second, it introduces students to key debates about the continent within the field of political science and in public policy more broadly. We do this through close, critical readings of key texts which have shaped perennial debates about politics in Africa.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 24000 - Politics of Southern Africa

A survey of politics, race relations, and African nationalism south of the Zambezi: Angola, South Africa, Namibia, Zimbabwe, Mozambique, Lesotho, Botswana, and Swaziland. Special attention to South Africa, its relations with adjacent areas and other states north of the Zambezi and abroad, and the problems of revolutionary change.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 24100 - Argument and Evidence in Political Science

This course focuses on the construction of social science arguments, the joining of theory and literature with hypothesis development, and the joining of hypotheses with methods, data, and interpretation of results. Qualitative and quantitative methods in political science are introduced, and fundamental methodological debates and choices are presented.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 24500 - Caribbean Politics

The course will focus on key actors and institutions shaping contemporary Caribbean politics and policy. Of particular importance will be the role of those actors and institutions, both domestic and transnational, in shaping development in the region. Case studies will be drawn from several islands to maximize the comparative nature of the course.

Credits: 3. Contact Hours: 3 hours

PSC 25200 - Theories of International Relations

Analysis of basic theoretical approaches at the individual, state, sub-systemic (regional) and systemic (international) levels. Includes discussion of personality and psychological approaches, decision-making, comparative foreign policy, regional integration, alliances, and the international system. Basic introduction to social science methodology as applied to international relations.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 25300 - International Law

Development of the basic principles of international law, including those relating to war and peace. Special attention will be placed on the role of international law in international relations and recent legal problems in international politics: trade, the sea, terrorism, the redefinition of sovereignty, minority and human rights, and international criminal tribunals.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 25400 - International Organization

General and regional intergovernmental organizations, with emphasis on purposes, organs, functions and processes of the United Nations; problems of conflict resolution, decolonization, disarmament, social and economic development and the application of international law are discussed. The National Model United Nations Simulation (PSC 25500) may be taken as an adjunct to this course.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 25500 - Model United Nations Internship

Simulation of the United Nations in class and at local level, leading to a national exercise, held partly at the U.N., which brings together college students from around the country, from Canada, Puerto Rico and Japan. Should be taken simultaneously with, or after, PSC 25400. Open to other students only by permission of instructor.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 25604 - Contemporary World Conflict

The world in the late 20th century and at the beginning of the 21st century has witnessed several major conflicts locally, nationally and globally. Militarism, poverty, and socio-economic inequality, women's subordination and oppression, racial and ethnic discrimination, human rights violation, nationalism, religious fundamentalism, terrorism,

globalization and environmental degradation constitute some of the more important factors generating the conflicts in question. This course attempts to do three things: (a) clarify the meaning of the term "conflict" and discuss the various means by which conflict management and resolution are achieved; (b) examine the nature and development of multi-factor conflicts in such selected situations as Northern Ireland, South Africa, the former Yugoslavia (especially Bosnia), Afghanistan, and Israel and Palestine; and (c) outline and analyze such phenomena as the struggle for human rights and women's rights, the peace movement, the confrontation between Islamic fundamentalism and the West, the recent war against terrorism, the anti-globalization movement, and the politics of humanitarian intervention.

Credits: 4. Contact Hours: 4 hr./wk.

PSC 26000 - American Constitutional Development

The most honored and fundamental principles of the American political system, and many of this country's most divisive crises, have been debated and challenged in terms of constitutional law. This seminar examines the nature and scope of the powers of the federal judiciary, Congress, the presidency, and the relationship between the federal government and the states. One goal of this seminar is to emphasize that answers to questions about the proper ways in which to organize a political system around even the most fundamental principles -- such as separation of powers, federalism, representative democracy, liberty, equality, and the rule of law -- have changed throughout this country's history. The modern constitutional regime is, in complex ways, vastly different from what the Framers of the Constitution imagined. These changes raise fascinating questions about methods of constitutional interpretation, as well as judicial and political fidelity to our constitutional regime - all of which will be covered through a review of these historical developments and the leading cases in the constitutional law canon. Open only to students participating in the Skadden, Arps program.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 26100 - The Legal Profession

This seminar will explore the legal profession in the United States as it existed in the past and as it exists in the present. Students will learn about the structure of the profession, different practice areas, and issues regarding women and minorities. Guest speakers will directly address life as a lawyer in their specific fields. Students will be assigned 5 papers throughout the semester. Students are to meet with the seminar's writing instructor, to develop and write these papers. Open only to students participating in the Skadden, Arps program.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 27300 - Political Systems of Asia

The political institutions in the Far East and developments in Southeast Asia in the framework of world politics. Analyzes selected problems affecting six major powers: Japan, India, Pakistan, Indonesia, Communist China and Russia-in-Asia.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 27400 - Modern Political Thought: Up to 1848

Will explore some of the political, social and ethical ideas which arose out of the process of modernization as it first occurred in the West. Readings vary from term to term, but include some of the following: Machiavelli, Hobbes, Locke, Montesquieu, Diderot, Rousseau, Burke, Paine, Bentham, Hegel, Marx (early writings), Shakespeare, and novelists of the nineteenth century. There will be special emphasis on the Enlightenment and French Revolution.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 27500 - Contemporary Political Thought: 1848 to the Present

Issues and ideas discussed will include: alienation, anomie, mass society, eclipse of community, bureaucratization, uses and abuses of technology, totalitarianism, and ambiguities of modernization.

Readings may include Marx, Weber, Freud, Kafka, Arendt, Orwell, and other nineteenth and twentieth century thinkers.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 27504 - Contemporary Political Thought

Issues and ideas discussed will include alienation, anomie, mass society, eclipse of community, bureaucratization, uses and abuses of technology, totalitarianism, and ambiguities of modernization.

Readings may include Marx, Weber, Freud, Kafka, Arendt, Orwell, and other nineteenth and twentieth century thinkers.

Credits: 4. Contact Hours: 4hr/wk

30200 PSC 30200 - The American State

As we have increasingly looked to the federal government to provide and protect policies and rights that benefit its citizens, how have the branches of government risen to this occasion? Where have they struggled? What obstacles have they faced? This course is an investigation of the political, institutional, and legal development of the American state in the contemporary era. Topics will include an examination of some foundational questions about the role of the federal government; the ways in which the executive, legislative, and judicial branches have provided (or gotten in the way of) providing benefits and rights; and a variety of policy areas including the politics of mass incarceration, civil rights, and the welfare state, among others.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 30300 - Power, Inequality, and U.S. Social Policy

This course examines the development of the American welfare state and current conflicts and political debates about its performance and future. The course aims to improve your understanding of the history of social welfare policies in the United States and the political challenges associated with changing these policies. Typically, one policy brief of 15 pages. Two essay exams and three oral classroom presentations.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 30800 - Jurisprudence

In this seminar, we will address debates about judicial philosophy and legal reasoning, with a special focus on the law/politics distinction. We will examine scholarship that asks how judges might be constrained in their decision-making - i.e., through precedent, deference to the elected branches, originalism, etc. As we read work by Dworkin, Scalia, Breyer, critical legal scholars, and others, we will evaluate how the legal interpretation of the common law, statutes, and the Constitution differs from any other type of political decision, and explore what our conclusions imply for the ideology of the rule of law. Open only to students participating in the Skadden, Arps program.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 30900 - Advanced Legal Analysis

This innovative pre-law honors seminar has been designed by the Flom Professor, an experienced law school professor, to introduce Skadden Scholars to the topics and skills that are essential prerequisites for success as a law student: legal research and writing, case review and outlining, variations on the Socratic Method, doctrinal analysis, and the traditional law school exam hypothetical. To prepare Skadden Scholars for the rigors of the law school curriculum, the seminar reading assignments include the leading law school casebooks for constitutional law (Sullivan & Gunther) and torts (Prosser), as well as supplementary readings on legal analysis and test-taking skills. Open only to students participating in the Skadden, Arps program.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 31000 - Independent Readings and Research in Political Science

Designed to meet the special needs of individual students not met by existing courses. Requires approval of Department Chair and availability of an instructor willing to supervise the reading or research program before registering.

Credits: 1-3. Contact Hours: 1-3 cr./sem.

PSC 31051 - Community-Based Research

The course introduces students to several different approaches to community-based research, and compares it to more standard social science research practices. The course introduces community-based and advocacy research tools, strategies and uses, and links them to a practicum with existing community organizations.

Credits: 3. Contact Hours: 3

PSC 31125 - Social Contract Theories

The concept of the social contract is one of the most vital ideas of the Enlightenment period that gave rise to the two revolutions that have done the most to shape the modern world: the American Revolution and the French Revolution. What does Social Contract theory state? How does the social contract theory justify political obedience? On a more contemporary note, is it possible to see the relevance of social contract theory today in a world of political extremism?

Credits: 3. Contact Hours: 3 hr./wk.

PSC 31147 - Community Organizing

This course introduces students to the practice and skills involved in community organizing, and combines readings, meetings with active community organizers in New York City, and several practical exercises in outreach, issue-identification, and campaign planning.

Credits: 3. Contact Hours: 3

PSC 31450 - Powell Fellowship Seminar 1

During the first semester, students participate in a seminar sequence introducing them to the public policy process. The introductory module on public policy teaches students about the nuts and bolts of the policy making process. In their second semester, students complete a similar module, introducing them to service based modules of social change. The public service module is made up of weekly seminar meetings supplemented by a 25 hours service project, designed to provide students with the opportunity to reflect on and deepen the information they receive in the seminar. In both the first and second semester, seminars are supplemented by regular workshops that build student's soft-skills in networking, public speaking, and resume writing.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must be participants in the Colin Powell Leadership Program.

PSC 31451 - Powell Fellowship Seminar 2

During the first semester, students participate in a seminar sequence introducing them to the public policy process. The introductory module on public policy teaches students about the nuts and bolts of the policy making process. In their second semester, students complete a similar module, introducing them to service based modules of social change. The public service module is made up of weekly seminar meetings supplemented by a 25 hours service project, designed to provide students with the opportunity to reflect on and deepen the information they receive in the seminar. In both the first and second semester, seminars are supplemented by regular workshops that build student's soft-skills in networking, public speaking, and resume writing.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Students must be participants in the Colin Powell Leadership Program.

PSC 31505 - The Media's Influence on Public Policy in the U.S.

This course looks at some of the ways the press influences how the American Political system functions, with a special focus on its role and impact in the development of public policy.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 31507 - The Politics of Immigration

Provide a comparative overview of immigration as a political, economic, and social issue. It develops cumulative themes which define

immigration from several perspectives, and builds to an analysis of policy options in the United States and elsewhere.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 31607 - Humanitarian Intervention

This course examines the history of mass atrocities, and the ways in which states, international institutions (principally the United Nations), and non-state organizations have responded to them, and the debate over armed humanitarian intervention. It starts with the early 20th century but focuses principally on the mass killings that have occurred since the end of the Cold War.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 32300 - Legislative Internships

Offers students the opportunity to participate in the New York Assembly or Senate Internship Programs, or other legislative internships that combine practical experience and academic training. Credit varies, though typically 12 credits will be awarded for those students who successfully complete the programs offered by the New York State Legislature.

Credits: 3-12. Prerequisite: Junior or senior status and permission of the chair.

PSC 32400 - The Politics of Protest

The emergence, development and ultimate impact of protest movements on politics and policy in American politics. Through an examination of several movements in the United States after World War II, such as the civil rights, women's and anti-tax movements, the course will focus on three basic sets of questions: under what circumstances do dissident movements emerge? How do dissidents choose political tactics and strategies? And how do movements influence more conventional politics and policy?

Credits: 3. Contact Hours: 3 hr./wk.

PSC 32500 - International Security

This course offers an overview of the field of international security. Topics will include traditional threats to international security, such as interstate war, as well as today's more diverse "garbage bag of threats," including nuclear proliferation, terrorism, and failed states.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 32600 - Nationalism, Identity and Ethnic Conflict

This course examines the role of identity in international politics. Far from eroding as a result of globalization, ethnic, national, and religious sources of allegiance have only grown in importance, making such politically salient identities essential to understand. Topics include ethnic conflict, the rise of nationalism, and religious violence.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 32701 - Seminar Internship in Public and International Affairs

This course is part of a City University internship program designed for students interested in the practical aspects of government at city, state and federal levels, as well as in international organizations.

Credits: 4. Contact Hours: 2 hr./wk., plus internship

PSC 32702 - Seminar Internship in Public and International Affairs

This course is part of a City University internship program designed for students interested in the practical aspects of government at city, state and federal levels, as well as in international organizations.

Credits: 4. Contact Hours: 2 hr./wk., plus internship

PSC PSC 33300 - The Politics of Crime and Punishment

This course examines the politics of crime, criminalization, and punishment within the context of how state institutions are expanded, consolidated, and legitimized. By considering the relationship between crime, punishment and the state, this course will present some of the

diverse ways in which political leaders and their opponents have used crime and punishment to shape, extend, or resist state institutions over time. The course is comparative in nature which means material is primarily drawn from outside of the United States, though the U.S. and New York will be discussed as part of our examination of the politics of other countries.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 34000 - Feminist Political Thought

This course reviews and analyzes key texts of feminist political thought, as well as some of the more traditional text that also consider women's "place" in the political sphere. This study is done against the background of women's attempts throughout history to carve a place for themselves in liberal policies that disregarded women's voices even as they justified their own existences by embracing ideas like "equality" and "human rights" for all human beings.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 35500 - Environmental Politics: Comparative and Global Perspectives

Examines the rise of environmental consciousness and the key actors and institutions in environmental politics and policymaking at the domestic level. In particular such issues as global warming, ozone depletion, biodiversity, deforestation, and the links between environment and economic development are addressed. Latin America contains much of the planet's rainforests and biodiversity, hence has a great concern for "green" environmental issues. It is also urbanizing at a rapid rate and must address the "brown" environmental issues associated with rapid city growth and industrialization. Many of the cases read and examples cited during the course are drawn from Latin American context.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 35600 - Contemporary World Conflict

An advanced-level course focusing on the psychological, sociological, cultural, economic and military causes of inter-state and civil insecurity; methods of conflict resolution; and analyses of selected contemporary conflicts.

Credits: 3. Contact Hours: 3 hr./wk.

PSC 37600 - Marxism

A study of Karl Marx's social thought and political activity, and of other radical responses to modern capitalism. We will explore some of the "different roads to socialism" that have emerged in the twentieth century. There will be special emphasis on the contrast between democratic socialism and Leninism..

Credits: 3. Contact Hours: 3 hr./wk.

PSC PSC 39900 - Peacemaking and Negotiations

This course will examine international negotiation and peacekeeping, from the United Nation's first inception up to current operations in the field, focusing on the Middle East, Africa, Central America, the former Yugoslavia, Cambodia, East Timor, and elsewhere. We will study the role of both the UN and individual mediators in the peace process as well as the context and history of conflict in each of these regions.

Credits: 3. Contact Hours: 3 hr./wk.

PSY - Psychology Course Descriptions

PSY 10101 - Psychology for Freshman Honors Students

Designed to provide for greater student participation. In addition to attendance at special PSY 10101 lectures, students will participate in a 2 hour seminar, during which student papers will serve as the basis for class discussion.

Credits: 3. Contact Hours: 2 lect., 2 seminar hr./wk.

PSY 10200 - Applications of Psychology in the Modern World

An introduction to the study of human development and learning, personality and motivation, sex differences, attitudes, aggressions, interpersonal attraction, behavior in groups and work settings, abnormal behavior and its treatment. Emphasis on the ways in which psychological theory and research can be applied to individual and social problems. May not be taken for credit by students who have already passed PSY 10101 or PSY 10299.

Credits: 3. Contact Hours: 3 hr./wk.

PSY 10204 - Psychology in the Modern World

An introduction to the study of human development and learning, personality and motivation, sex differences, attitudes, aggressions, interpersonal attraction, behavior in groups and work settings, abnormal behavior and its treatment. Emphasis on the ways in which psychological theory and research can be applied to individual and social problems. Required for all other Psychology courses.

Credits: 4. Contact Hours: 4hr/wk

PSY 10299 - Applications of Psychology in the Modern World

An introduction to the study of human development and learning, personality and motivation, sex differences, attitudes, aggressions, interpersonal attraction, behavior in groups and work settings, abnormal behavior and its treatment. Emphasis on the ways in which psychological theory and research can be applied to individual and social problems. For ESL and SEEK students.

Credits: 3. Contact Hours: 6 hr./wk.

PSY 20300 - Psychology as the Science of Behavior

Introduction to basic research methods in Psychology. Students will gain first-hand experience in using a range of scientific methods to study basic psychological questions and will critically examine reports of social science findings. May not be taken for credit by students who have passed PSY 10101.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10200 or PSY 10299 (required for Psychology majors).

PSY 21500 - Applied Statistics

Summation notation, frequency distributions; graphs; percentiles; measures of central tendency and variability; standard score; the normal curve; statistical inference; one-sample tests of significance; confidence intervals; 2-sample tests of significance; linear correlation and regression; chi-square. All procedures are examined in the context of their application to research in psychology. Credit will be given for only one of the following courses: PSY 21500, SOC 23100, ECO 20150. Required for Psychology majors.

Credits: 4. Contact Hours: 5 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299.

PSY 22600 - Introduction to Life-Span Development

Introduces theories, concepts and research which enrich our understanding of human development throughout the life cycle. Students may wish to take this course as a general introduction to human development before enrolling in courses which focus on particular developmental periods. (PSY 24600, PSY 25600 and PSY 26600).

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 or PSY 20300.

PSY 23300-23600 - Laboratory and Field Work

For students who wish to supplement classroom work by supervised experience in the field. It is expected that a student will work on the average of 3 hr./wk. per credit. Approval is required.

Credits: 1. Contact Hours: 3 hr./wk. Prerequisite: Or coreq.: PSY 10101 or PSY 10200 or PSY 10299. Pass/Fail grade.

no more than six credits in any one department and no more than nine credits total will be permitted for the following courses: ANTH 13300-13600, ASIA 20402, BLST 20000-20400, PSY 23300-23600, SOC 23300-23600.

PSY 24600 - Introduction to Human Development: Infancy and Childhood

Topics include genetic considerations; prenatal development; the characteristics of the neonate; cognitive processes; language development; personality changes; early socialization; moral development.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299.

PSY 24700 - Social Psychology

Fundamental concepts and methods used in the investigation of attitude and attitude change, prejudice, socialization, communication, groups, conformity and other topics. Issues will be studied in the light of theory, research and relevant social problems.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299.

PSY 24900 - Psychology of Personality

This course explores the determinants of personality from a variety of perspectives, including psychodynamic, behavioral, cognitive, and humanistic, while also exploring how personality is influenced by factors such as gender, ethnicity, and culture. Students come to appreciate different perspectives regarding how and why people differ from one another.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10100 or PSY 10200 or PSY 10299.

PSY 25300 - Cognitive Psychology: Thinking, Knowing and Remembering

How do we come to understand the world we live in and the people with whom we interact? How is self-knowledge acquired? This course will consider the ways in which people acquire and process information. Why do we forget some things and remember others? How do we solve problems, learn to read and write, find the right words to express our ideas? What is "thinking?" How do we transform our ideas into action? Other topics include how computers process information; brain damage; and learning disabilities.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299.

PSY 25400 - Brain, Mind and Experience

This course will explore the nature of the relation between the brain states, mental states and complex human experience. It is intended to expose students to the intersection between the biological sciences and psychology.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10100 or PSY 10200 or PSY 10299.

PSY 36900 - Behavior in Organizations

This course examines individual factors such as personality, perception, attitude, emotion, and learning and their effects on behaviors at the interpersonal and organizational levels. Communication, work teams, decision making, conflict, and negotiation factors are considered at the interpersonal level. Culture, structure, technology, environment, and climate at the organizational level are considered. These three levels of processing are considered for their impact upon worker productivity, satisfaction, motivation, learning and performance management. Career management is a central theme that is emphasized throughout the course.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299. Corequisite: PSY 32100.

PSY 30100-30400 - Honors I-IV

Prior application to and approval by Honors Office and permission of Psychology Department Honors Supervisor required.

Prerequisite: PSY 21500; Prereq or Coreq: PSY 32100.

PSY 31000 - Independent Study

For students who wish to pursue advanced study or research in selected topics. Students must obtain written permission of faculty mentor and Dr. Milstein, before registration. The mentor must approve both the number of credits and the student's plan of study (PSY 31001-1 cr.; PSY 31002-2 cr.; 31003-3 cr.; PSY 31004-4 cr.). This could involve intensive reading on a selected topic and does not necessarily involve experimental research.

Credits: 1-4.

PSY 31100-32000 - Seminars in Special Topics in Psychology

Specially selected topics for intensive examination in several different areas. The topics and the courses offered each semester will be listed by the Psychology Department. Prerequisites stated with course descriptions.

Credits: 3. Contact Hours: 3 hr. /wk.

PSY 31500 - Community Service

This course incorporates a community service fieldwork experience, integrated with assigned readings, classroom discussion, and analysis, culminating in the creation of a student-led service learning project designed to positively impact declining CCNY retention and graduation rates.

PSY 31824 - Psychology of Parenting

Students are given opportunities to examine the practice of parenting through interdisciplinary approaches. Students will explore the roles of parenting and parenting styles as well as the effects of particular parenting strategies on the social, physical, emotional, cognitive and overall growth and development of children. Cultural similarities and difference in beliefs regarding child rearing will also be discussed.

Credits: 4. Contact Hours: 4hr/wk

PSY 32100 - Experimental Psychology

The application of research methods to psychological problems. Techniques of formulating and investigating a problem and use of laboratory equipment are stressed. Experiments are performed in representative areas of psychology.

Credits: 4. Contact Hours: 2 lect., 4 lab hr./wk. Prerequisite: MATH 17300 or PSY 21500 or SOC 23100 or ECO 20150.

PSY 32500 - Market Research Methods

This course is designed to help students think critically about psychological research as applied to real-world problems by understanding the main types of research designs and methods used by consumer researchers and business and marketing analysts. Students develop practical skills and expertise in qualitative and quantitative research methods, analysis, and reporting.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299, and PSY 21500, and PSY 25900 (Consumer Psychology)

PSY 33000 - Positive Psychology

This is an introduction to the scientific study of optimal human functioning. The focus will be on the factors that allow individuals and communities to thrive or flourish. Topics on positive states (happiness, gratitude, flow) and positive traits (resilience, optimism) will be covered.

Credits: 3. Contact Hours: 3 Prerequisite: PSY 10101 or PSY 10200 and PSY 24700 or PSY 24900 Corequisite: PSY 32100

PSY 33100 - Evolution of Modern Psychology

The theoretical and conceptual problems involved in the development of psychology as a science and its relationship to other disciplines. An examination of selected theories, such as behaviorism, gestalt psychology and Freud, which have attempted to deal systematically with such persistent problems of psychology as perception, motivation, learning and personality. Recommended for juniors and seniors.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and any 20000- level course. Prereq or Coreq: PSY 32100.

PSY 33300 - Psychology of Enculturation, Immigration and Acculturation

Migration disrupts familiar rules of living and leads to conflicts of culture. This course will review developmental psychology theory and discuss psychological disruptions experienced by immigrants in relation to their individual developmental stages. We also will examine disruptions specific to particular ethnic groups. The course will discuss the psychological vulnerabilities as well as resiliencies that result from the process of immigrant acculturation. Throughout the course we will seek to discern preventive measures that could lessen negative outcomes and promote positive outcomes through effective decision making in response to disruptions of migration.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10100 or PSY 10200 or PSY 10299 and PSY 22600 or PSY 24600. Prereq or Coreq: PSY 32100.

PSY 33700 - Parent-Infant Relationships

This course will introduce students to a wide range of approaches to the study of infancy and toddlerhood, including the development of attachment, autonomy, and a wide range of self-regulatory capacities. Theories of early infant social development in play, language and representation. The course will also consider the development of parent identity: what goes into making someone a "good" parent, and how can one, as an adult, change in the ways necessary to positive parenting? Finally the course will consider recent development in parent-infant intervention, specifically parent-infant psychotherapy.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101, PSY 10200 or PSY 10299 and PSY 22600 or 24600. Prereq or Coreq: PSY 32100.

PSY 33800 - The Psychology of Women

This course explores the social constructions, theories and research that have resulted in a psychology of women. It includes the biological, developmental, social and cultural aspects of femaleness in an historical and contemporary context. Students will be expected to consider and contribute from their own gender-establishing experiences.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 33900 - Psychology Applied to Work

Problem solving in the work environment using principles derived from psychological research: selection and placement of employees, psychological testing, job analysis, job evaluation, employment interviewing, performance appraisal and feedback, employee and management training and development, workplace design and human engineering. Emphasis will be placed upon social issues such as affirmative action, equal employment opportunity, substance abuse, and health and safety in the workplace.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 34000 - Drug and Alcohol Abuse: Causes and Treatment

Discusses theory and research on personality, developmental and genetic factors in the lives of drug and alcohol abusers; diagnostic techniques for the assessment of substance abuse and addiction; and

the various techniques used in the treatment and prevention of drug and alcohol abuse. Required for CASAC Program.

Credits: 3. Contact Hours: 3 hrs./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 25400. Prereq or Coreq: PSY 32100.

PSY 34300 - Sensation and Perception

The psychology of sensation and perception in the study of how we humans see, hear, taste, smell, and touch the world around us. One sub-field is concerned with how people see colors, another with how people appreciate works of art & how people listen to music. By the end of this course, you should have a good grasp of what perception psychologists study, and some of their most important research findings.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 25300 or PSY 25400. Prereq or Coreq: PSY 32100.

PSY 34400 - Psychology of Language

Students are introduced to psycholinguistics through readings in linguistics, psychology, philosophy, education, artificial intelligence and neurocognition. Sound-writing-sign structures, semantics, syntax, pragmatics and discourse and their psychological processing including bilingualism, language acquisition and loss in disorder or brain damage, and organization in the brain are studied. Issues relating language to consciousness, and whether animals "have" language will be discussed.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101, PSY 10200 or PSY 10299 and PSY 25300 or introductory course in Linguistics. Prereq or Coreq: PSY 32100.

PSY 34500 - Psychology of Violence

An introduction to the psychology of violence, with emphasis placed on understanding the scope of violence, its cause and effects.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101, PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 34700 - Social Psychology of Racism and Prejudice

The social psychology of prejudice and a particular form of prejudice-racism. The course activities are designed to help students understand how this behavior has been researched by behavioral scientists and has changed over time. The course will also explore how individuals and institutions perpetuate racism and prejudice across generations. Course content will also offer an introduction to definitions and origins of prejudice. Students will also learn about the origin and nature of stereotypes. Course readings and assignments will help students understand individual, cultural and institutional racism and learn about efforts to prevent prejudice and racism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10100 or PSY 10200 or PSY 10299 and PSY 24700. Prereq or Coreq: PSY 32100.

PSY 34800 - Abnormal Psychology

The description of various psychological disorders. Through the study of these disturbances the course gives insight into the general nature of personality functioning. Case material is presented.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24900. Prereq or Coreq: PSY 32100.

PSY 35000 - Treatment of Substance Abuse

This course takes an applied approach to recent research and theory concerning the treatment and prevention of substance abuse. More specifically, the course offers a comprehensive introduction to all aspects of case managements: assessment, planning, linking, monitoring and advocacy. A range of treatment options will be considered. However, our main focus will be behavioral, and this particular model of treating substance abuse will be examined in detail. Case examples will be used. Required for CASAC Program.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 35100 - Psychology of Human Sexual Behavior

Sexual behavior, attitudes, developments, and the consequences of the behavior are examined from a psychological perspective. Topics include historical and cross-cultural viewpoints, theories of human sexuality, gender roles, sexual dysfunction, sexual preference, psychological development of adult sexuality and aging sexuality.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 35200 - Sleep, Dreams and Sleep Disorders

This course will survey the principles of sleep organization and the evaluation and treatment of sleep disorders. Basic science topics will include assessment of sleep and sleepiness, homeostatic and circadian regulation, brain mechanisms, ontogeny, dream process, and memory. Applied topics will include sleep disorders assessment and treatment of conditions such as Insomnia, Narcolepsy, Sleep Apnea, Sleep Walking, Night Terrors, REM Behavior Disorder, Circadian Rhythm Disorders and Pharmacology.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 25400. Prereq or Coreq: PSY 32100.

PSY 35300 - A Seminar on Memory

This course provides students with an opportunity to examine the centrality of memory in human experience. Using observations from normal and extraordinary people, we will consider three broad questions, First, how does information acquired in the past insinuate itself into a persons' current thoughts, feelings and actions? Second, what relation do our current conscious recollections have to actual past events and experiences? Third, can memories that operate outside of the awareness affect our sense of the present, past and future state of affairs, and if so, how does this occur?

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or 10299 and PSY 25300. Prereq or Coreq: PSY 32100.

PSY 35500 - Psychology of Women and Violence

This course explores gender violence in its multiple forms from both a national and a global perspective. This class covers current theories and research pertaining to violence against women and the factors that contribute to it. Methods to address and alleviate this worldwide problem are also presented. Particular emphasis will be placed on exploring gender violence from a psychological perspective, examining risk and protective factors, and the consequences of being violently victimized, with the goal of understanding human behavior and interaction

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 35600 - Introduction to Human Development: Adolescence and Youth

From puberty through early adulthood. Topics include the physical and psychological changes associated with puberty and the assumption of adult sex roles; cognitive and personality changes associated with developing autonomy; the varying social and cultural contexts within which adolescents and young adults develop; and the relationships of these age groups to social institutions.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24600 or PSY 22600. Prereq or Coreq: PSY 32100.

PSY 35700 - Community Psychology

The use of psychology in the solution of community problems, and the impact of social and psychological stressors is examined from a community-wide perspective. How can communities and neighborhoods be measured for mental health strengths and dangers? What kinds of preventive actions and strategies, and what kinds of

treatment and programs can be taken on a community-wide basis to promote mental health?

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 36000 - Treatment of Substance Abuse II

The aim of this second section of treatment of substance abuse is to further introduce CASAC and other psychology undergraduate students to concepts relevant to the assessment, evaluation, treatment, planning, case management, and referral and service coordination for Alcohol, Tobacco, and Other Drug (ATOD)-related problems. A range of evidence-based methods will be discussed including the latest empirically supported screening and assessment instruments. Students will gain knowledge of the diagnostic criteria for alcohol and substance use disorders utilizing the Diagnostic and Statistical Manual Fifth Edition (DSM-5). Required for CASAC Program.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101, 10200, or 10299, and PSY 22600 or 24600 or 24700 or PSY 24900. Prereq or Coreq: PSY 32100

PSY 36100 - Health Psychology

This course presents a survey of theory and research in health psychology. The aims of this class are to 1) acquaint students with current research in a variety of areas such as stress, coping, social support, prevention of illness, and health promotion; 2) broaden students' understanding of models, theories, and methods employed in health psychology research.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299, and PSY 24700, or PSY 24900. Corequisite: PSY 32100.

PSY 36300 - Psychology of Prevention

This course examines the history and societal tensions between mental health promotion and mental illness treatment. We study the skills necessary to promote mental health and reduce risks for mental illness through community-based interventions, while learning the specific vocabulary of prevention research. Required for CASAC Program.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 36400 - Psychology and the Black Experience

This course examines the psychological aspects of historical and contemporary experiences of people of African ancestry. The work of noted black psychologists in the United States and abroad is utilized to address issues of well-being and abnormality as they pertain to black people's past and current realities. Topics will include cross-cultural perspectives in black psychology, the black family, ethnic identity, education and the black child, mental health concerns of black people, research issues and the black community.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Either PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 36500 - Family Psychology

Family structure and process in terms of historical, cultural and psychosocial factors. Emphasis on viewing family interactions in terms of a psychodynamic system and subsystems. The complex relationships within the family and between the family and society serve as a setting for theorizing, researching and developing models of constructive intervention. Required for CASAC Program.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10100 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 36600 - Introduction to Human Development: Adulthood and Aging

From early adulthood (marriage, parenthood, first job) up to the end of the life cycle. Topics include the developmental approach to adulthood; considering the psychological, sociological, and biological changes in adult life; sex differences; the family; work, leisure, and retirement; death and bereavement.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24600 or PSY 22600. Prereq or Coreq: PSY 32100.

PSY 36700 - Small Group Processes

The course is divided into two parts: self-study groups and lectures. The self-study group examines its own behavior in order to help the student develop an ability to observe, analyze and understand the small group as a social system. The lectures present concepts, case materials, and empirical findings on group phenomena. Required for CASAC Program.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 37000 - Counseling Issues in Addiction

This course provides an overview of the field of addiction counseling with an emphasis on developing a detailed understanding and foundation of skills in the use of specific strategies, procedures, and interventions in assessment, diagnosis, and treatment of substance abuse. The course will summarize key points drawn from the following areas: the American experience with addiction and recovery, theoretical explanations for understanding addiction, basic pharmacology and neuroscience, and assessment and treatment of issues specific to addiction counseling. The course will also provide a general overview and introduction to the psychopharmacology of alcohol, and major drugs and classes of abused substances as well as prescription drugs commonly used in treating. This course is required for CASAC certification (Credentialed Alcoholism and Substance Abuse Counselor).

Credits: 3. Contact Hours: 3 hours

PSY 37100 - Introduction to Cognitive Neuroscience

Science of behavioral neurobiology and psycho-biology. The course will emphasize topics in neurobiology including history of brain/mind research, models of brain/behavior relationships, cellular and chemical interactions, brain development/aging, biological rhythms, systems of sensation and movement.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 25400. Prereq or Coreq: PSY 32100.

PSY 37300 - Neuropsychology

Consideration of the effects of brain damage on psychological functioning, with emphasis on impairments in perception, attention, emotion, memory, and language abilities.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24900. Prereq or Coreq: PSY 32100.

PSY 37700 - Theories of Personality

A critical review of major contemporary theories of human personality, their relation to research findings and to methods of psychotherapy. Case studies interpreted from the perspective of the various theories.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100

PSY 38000 - Introduction to Clinical and Counseling Psychology

The aim of this course is to introduce basic concepts relevant to the application of clinical and counseling psychology, including pertinent ethical codes and considerations, provision of culturally competent interventions, and the centrality of the counselor and client relationship. Students will learn basic counseling and communication skills through

lectures, small group discussions, and role-plays. Issues of multiculturalism and diversity will be presented and developed throughout the course via readings, discussions and student writing assignments. The course will familiarize students with theoretical and practical tenets of counselor and client interactions, ethical responsibilities, interpersonal dynamics and dilemmas, and clinical supervision. Required for CASAC Program.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101, 10200, or 10299, and PSY 22600 or 24600 or 24700 or PSY 24900. Prereq or Coreq: PSY 32100

PSY 38800 - Theories of Psychotherapy

Designed primarily to discuss and evaluate different forms of psychotherapeutic intervention. Concepts such as resistance, transference, and working through will be treated in the context of both psychoanalytic and interpersonal theory. The aims and techniques of behavioral therapy and case histories will be presented for analysis.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900 or PSY 22600 or PSY 24600. Prereq or Coreq: PSY 32100

PSY 38900 - Psychological Tests and Measurements

Introduces both theoretical and practical aspects. Methods for assessing intelligence, achievement, aptitude, personality, interests and attitudes. Evaluation of tests and interpretation of test scores; use of tests in educational and clinical prediction, guidance, personnel selection, and research.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100.

PSY 40000 - Animal Behavior and Ethics

This course introduces students to the ethological study of animal behavior and to ethical issues in the treatment of animals.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: PSY 10101 or PSY 10200 or PSY 10299 and PSY 24700 or PSY 24900. Prereq or Coreq: PSY 32100

PSY 44000 - Internship in Psychology Applied to Business and Organizations

For students who wish to supplement classroom instruction in applied psychology related to business, nonprofit organizations and government. It is expected that students will work 6-10 hours per week in an internship in an organization approved by the department, meet in class for 3 hours per week and do reading and written work outside of class. Approval is required. Credits cannot be applied toward the credits required for the psychology major.

Credits: 5. Contact Hours: 5 hr./wk. Prerequisite: Grade of B+ or better in two courses related to applied psychology including: PSY 26900, Behavior in Organizations and PSY 33900, Psychology in the Workplace, OR PSY 25900, Consumer Psychology and PSY 32500 Market Research and others approved by the department. Students who select to do their internship in Market/Consumer Research, using as prerequisites Consumer Psychology and Market Research, must also complete PSY 32100, Experimental Psychology, as a prerequisite.

no more than nine credits in any one department and no more than twelve credits total will be permitted for the following courses: ANTH 13300-13600, ASIA 20402, BLST 20000-20400, PSY 23300-23600, SOC 23300-23600, PSY 31000, PSY 30600.

SCI - Secondary Education Course Descriptions

SCI 10001 - Man and Nature: Life (Honors)

For students in the City College Honors Program and the Macaulay Honors College. An exploration of the biological basis of life on earth and the impact of man's activities on its quality and continued survival. Those enrolled will participate in a seminar designed to permit in-depth examination of important issues related to the course content.

Credits: 4. Contact Hours: 3 lect., 2 rec./lab hr./wk.

SCI 10101 - The Physical Universe (Honors)

For students in the City College Honors Program and the Macaulay Honors College. A broad exposure to the physical sciences with heavy stress on the scientific method of inquiry and investigation. The basic principles of physics and chemistry; application to some phenomena of astronomy, geosciences, chemistry and physics.

Credits: 4. Contact Hours: 3 lect., 2 rec./lab hr./wk.

SCI 12400 - Principles of Physical Science

Explores the basic scientific content, processes, and approaches with an emphasis on depth of understanding in the domain of physical science. Subject matter is drawn from properties of matter, heat and temperature, energy, optics, and force and motion. Class format is a combination of interactive discussions, hands on activities, and participation in extended scientific processes. This course is one of three similar courses along with Principles of Life Science and Principles of Environmental Science which could be taken in any order.

Credits: 3. Contact Hours: 3hr./wk.

SCI 12500 - Principles of Life Science

Explores core topics in the biological sciences with an emphasis on depth of understanding of the subject matter and an awareness of the skills and methods used in the life sciences. Subject matter is drawn from cell and molecular biology, evolution, and ecology. Class format is a combination of interactive discussions, hands on activities, and participation in extended scientific processes. This course is one of three similar courses along with Principles of Physical Science and Principles of Environmental Science which could be taken in any order.

Credits: 4. Contact Hours: 3hr./wk.

SCI 12600 - Principles of Environmental Science

This undergraduate course explores core topics in the environmental sciences with an emphasis on depth of understanding of the subject matter and an awareness of the skills and methods used in the environmental sciences to better understand the interrelationships of the natural world. Subject matter is drawn from a variety of disciplines, including biology, chemistry, and earth science, and focuses on analyzing environmental problems both natural and human-made, and proposing alternative solutions to these problems. Class format is a combination of interactive discussions, hands-on activities, and participation in extended field studies. This course is one of three similar courses along with Principles of Physical Science and Principles of Life Science which could be taken in any order. This course satisfies the Physical Science requirement or the third science requirement for Childhood Education.

Credits: 3. Contact Hours: 4 hours per week integrated lab/discussion. Prerequisite: None.

SCI 28000 - Bioinfo & Biomol Sys

Bioinformatics and Biomolecular Systems is a computer laboratory-based interdisciplinary course that introduces essential concepts in recombinant DNA methods, bioinformatic databases and computational software. A number of "in silico" tools and one case study is used to simplify and integrate disciplines of molecular genetics and molecular structural biology early in undergraduate education.

Credits: 3. Contact Hours: 4 hours

SCI 36000 - Service Learning in Health and Wellness

This course is for science majors or those interested in health careers. Using classroom knowledge they address critical health issues facing Harlem, an undeserved community. Students examine Harlem's health pro-file to identify and develop solutions to its most prevalent health issues in partnership with community and governmental organizations.

Credits: 3. Contact Hours: 2 hr. plus fieldwork/wk. Prerequisite: Open to students with 30 or more earned credits

SOC - Sociology Course Descriptions

SOC 10500 - Individual, Group and Society: An Introduction to Sociology

The language of sociology, the sociological perspective, and basic areas of sociological inquiry. Topics include: culture, socialization, self and society, social stratification and social class. The family, religion, polity, community organization, collective behavior, mass culture, social order and social change.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 10501 - Introductory Sociology For Freshman Honors Students

Provides a basic framework for sociological investigation and some knowledge of the institutions which constitute the fabric of society. The emphasis will be on concepts, hypotheses and theories which explain social behavior. Although social problems of contemporary relevance are often discussed, the focus of most of the material is on sociological problems and on analytical issues in the study of society.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 23000 - Qualitative Research Methods

The logic and practice of the major qualitative research methods in sociology: field observation; participant observation; qualitative interview; thematic content analysis of sociological documents. Students design and carry out projects to gain mastery of these methods.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 23100 - Sociological Statistics

An introduction to statistical theory and techniques as utilized by sociologists. This course covers descriptive and inferential statistics. Credit given for only one of the following courses: SOC 23100, ECO 20150, PSY 21500.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SOC 10500.

SOC 23200 - Methods and Techniques of Sociological Research

The meaning and relevance of "the Scientific Method" as a canon guiding the logic of research in sociology. Historical perspective and method of social research in the recent past. Survey research, sampling, questionnaire construction analysis, and hypothesis- testing; community study, field observation, unstructured interviewing, participant observation, control of bias.

Credits: 4. Contact Hours: 4 hr./wk.

SOC 23300-23600 - Field Work in Social Service or Tutorial Research

Involves, according to student's choice, either: (1) placement in special agency (welfare, poverty, urban planning, police, detention) where a student learns by working directly with clients under close supervision of the agency; or (2) carrying out a research project in the student's area of interest. In either case, the student meets regularly with a faculty member of the Social Research Laboratory. No more than six credits in any one department and no more than nine credits total will be permitted in the following courses: ANTH 13300-13600, ASIA 20402-20404, BLST 20000-20400, PSY 23300-23600, SOC 23300-23600. These

credits count towards total credits needed for graduation, but do not count as credits needed for the major in Sociology.

Credits: 3 cr. Maximum: 6 cr. cumulative.. Contact Hours: 2 hr./wk., 1 cr.; 4 hr./wk., 2 cr.; 6 hr./wk.

SOC 23700 - Foundations of Sociological Theory

The roots of modern sociology in the ideas of nineteenth and early twentieth century theorists, such as Marx, Weber, Durkheim, Simmel, Veblen and Cooley, with emphasis on the intellectual and social context and current relevance of the concepts and propositions they developed.

Credits: 4. Contact Hours: 4 hr./wk. Prerequisite: SOC 10500. Suggested prerequisite: a course in the history of ideas such as HIST 35100, HIST 35200, HIST 35300 or PSC 27400.

SOC 23800 - Contemporary Sociological Theory

Modern sociological theory and practice. Contemporary theorists such as Parsons, Merton, Homans, Dahrendorf and others show how conceptualization and theory building proceeds in understanding self, society, class, power and alienation in the modern world.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 24000 - Personality and Social Structure

The relevance of biological and social factors (and the interaction of the two) are examined in an attempt to understand the variations and universalities of personality. Psychological and social theoretical views are presented, as are current works in socialization theory.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 24100 - Criminology and Corrections

Theories of crime causation and the social response to crime. Nature, extent, major types, and distribution of criminal behavior. The changing impact of police and the courts.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 24200 - Juvenile Delinquency

Theories of delinquency and youth crime, including the extent and major types of delinquent behavior, the impact of labeling, and explanations of re-entry into society. Analysis of delinquency causation, prevention, control and treatment. Strategies of diversion, alternatives to incarceration, the juvenile court, drug use and public policy, and the possibility of decriminalization.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 24300 - Sociology of Youth

Youth considered as a stage in socialization, a stratum, a demographic group with its own subculture, and as a force for change. Implications for education, mental health and urbanization.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 24400 - Principles of Social Work

Introduction to principles of group work, case work, and community action. Primarily designed for those planning a career in Social Work. Concurrent field work required (see description of Social Research Laboratory).

Credits: 3. Contact Hours: 3 hr./wk.

SOC 24404 - Principles of Social Work

Introduction to principles of group work, case work, and community action. Primarily designed for those planning a career in Social Work. Concurrent fieldwork required.

Credits: 4. Contact Hours: 4hr/wk Corequisite: SOC 23301.

SOC 24500 - Sociology of Social Welfare Institutions

Origins and growth of social welfare theory and practice. Impact of industrialization and urbanization. Trends in social legislation. Current issues and concepts. Social agencies and social work as a profession.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: Minimum of 2 electives in Sociology. Concurrent field work required (see description of Social Research Laboratory).

SOC 24800 - Studies in Deviant Behavior

Sources and effects of differences in behavioral norms between society at large and deviant groups (criminals, drug addicts, sexual deviates, cultural deviates). Power structure and the social definition and control of deviancy. Stigma, alienation and the problems of value relativism.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 25000 - Theory of Mass Culture and Mass Communications

The character of mass society in comparison with earlier forms. "High" culture and "pop" culture and the mass media of communications. Social effects of the mass media and the problem of public control.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 25100 - Urban Sociology

Nature and origins of the modern city, and of community life within and in relation to the metropolis. Urbanization as a process. Types of cities and urban communities. The changing nature of contemporary cities, urban development and the dilemmas of growth.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 25200 - Social Class

The application of various theories of social stratification to studies of societies and communities. The relationships of class positions to familial, educational, religious, political and economic behavior.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 25300 - Ethnic Minority Groups

Analysis of human relations from both social- structural and social-psychological standpoints. Prejudice and discrimination; their consequences for both minority and majority group members. Theoretical, historical, cross-cultural approaches. Examination of public and private organizations engaged in intergroup relations. Case materials from social action programs in the United States and other nations.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 25400 - Social Problems

The origins and career of "social pathology" as a sensitizing concept. The interrelationship between social issues, and social problems, and public policy. The problem of bias in defining a social problem and in devising a strategy for meliorative intervention. Case studies with contemporary relevance. Role of voluntary agencies, mass media and legislative bodies in identifying social problems.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 25500 - Population and Human Ecology

The determinants and consequences of human migration and differential population composition. Comparative fertility and mortality in relation to selected sociocultural factors. Demographic description and analysis as a research tool. Implications of population trends for local, regional, national and world problems. Recommended for all specialization programs in the Department.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 26000 - Theory of Social Change

Theories of institutional change in the past and present. How culture, social structure, and political, economic and technological factors are

interrelated. Case studies of change in Western Europe and in developing countries today.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 26200 - Political Sociology

Theories of the polity and political behavior in sociological perspective. Types of government and of political order viewed comparatively and historically, and in relation to economic and social-psychological factors. Legitimation and subversion (counter-legitimation) as social process. Social movements. Analysis of contemporary issues.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 26300 - Contemporary Social Issues

An examination of the major controversial issues of the day: abortion, homosexuality, capital punishment, and the like.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 26500 - Sociology of Childhood

Examination of the socialization process of childhood, the familial environment of the child, influence of the peer group, the development of the self and values. Major psychological and sociological theories will be examined in the light of empirical evidence.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 26600 - Family Relationships

Sociological explanations of how and why husband/wife, parent/child, and other family relationships have varied, historically and today, in the United States and around the world. How sociological research can contribute to understanding and making informed choices and decisions in family life.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 26700 - Social Change in Developing Countries

Major processes of change today in Latin America, Asia and Africa. Theories of development as applied to industrialization and changes in occupational structure; urbanization, internal migration and population growth; national integration; changes in the class structure; revolution and reform.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 26800 - Studies in Social Forces and Mass Movements

Mass movements for reform, revolution and renovation. Socialism, communism, fascism, and the forces that brought them into being, natural history and internal dynamics of the type they represent. Contemporary case materials.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 27000 - Sociology of Health and Illness

This courses examines health, illness, disability, and medicine from a social perspective. Topics may include: epidemiology, historical transitions in population health, social and cultural analysis of health and disease, medicine as profession and work practice, health policy, and the nature and role of health-related knowledge in professional and popular contexts.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 27200 - Religion and Religious Groups

The social bases for the function and impact of religion in contemporary society.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 27400 - Urban Politics and Policy

This course examines the changing U.S. city with a focus on New York City. Beginning with an overview of U.S. urban politics and policy, we explore the impact of economic, political, demographic and social

trends on our cities; then examine several contested policy issues—housing, economic development, education and/or welfare. How and why have national problems become identified as "urban" problems? Is the city a viable problem-solving unit? What are the respective roles of public and private sectors? We will address these questions through critical reading, discussion and writing.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 27700 - Ethnic Families in the United States

A description and explanation of male/female values, power, conflicts, and achievements of families from various ancestral origins. Included will be elite and minority families and old and new immigrant families from Europe, Africa, Asia, Latin America, and the Caribbean.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 29000 - Immigration

This course will examine the new immigration to the U.S. in the light of the old, searching for similarities that link this latest wave to the turn-of-the-century experience, and for the differences that make the post-1965 immigration distinctive.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 30100-30300 - Honors I-III

Approval of Dean and Department Honors Supervisor required. Apply no later than December 10 in the Fall term or May 1 in the Spring term.

Credits: Credit flexible but usually 3 credits per term..

SOC 31000 - Independent Study

The student will pursue a program of independent study under the direction of a member of the Department with the approval of the Department Chair. Credit may be from 1-4 credits, as determined before registration, by the instructor, with the approval of the Chair.

Credits: 1-4.

SOC 31100-32000 - Selected Topics in Sociology

See Department for information.

Credits: Hours and Credit TBA..

SOC 31211 - Pub Pol Intrn 2

Credits: 3. Contact Hours: 3 hours

SOC 31511 - Interviewing

This practicum introduces students to accepted interviewing techniques with individuals and groups using both structured and unstructured questionnaires, reviews current federal regulations concerning the protection of human subjects and their informed consent, provides observations of good interviewing and recording techniques, and examines the theory and practice of focus groups. The use of translation and translators and other practical cultural and ethical issues are discussed. Students gain an understanding of the function of interviews conducted in the social sciences and in a variety of professional settings including social work, human resources, health and human services and journalism. Training and supervision in structured interviews with volunteer research subjects will be provided. Advanced students may conduct supervised focus groups.

Credits: 4. Contact Hours: 4hr/wk

SOC 31654 - The Color Line: Sociological Perspectives on Race and Racism in 20th Century American Life

This course provides an historical and sociological background for examining the concept and expression of "race" and racism in America. The course does not confine itself to the traditional Black vs. White notions of race relations, but includes Latin, Asian, and Native American experiences, anti-Semitism and the experiences of "white" ethnic groups such as Italians and the Irish. The significance of the growth of "mixed race" population is also covered. The course intends to help

those enrolled better understand personal experiences of race and to challenge stereotypes and pre-judgments.

Credits: 4. Contact Hours: 4 hr./wk.

SOC 31717 - Organizations and Collective Action

This course is an introduction to the sociological study of organizations. This course has two main objectives. First, this course examines the literature on formal organizations, with a focus on understanding the consequences of different organizing practices for organizations' members and society. Second, this course prepares students to undertake research and critical analysis of organizations, with the aim of helping students apply theoretical concepts to organizations that they have observed. To accomplish these objectives, course readings include both an overview of major theoretical perspectives, as well as excerpts of primary research. In addition, the class will discuss strategies for conducting organizational research, and students will conduct a research project comparing organizations' methods of controlling members and organizations' impact upon society.

Credits: 4. Contact Hours: 4 hr./wk.

SOC 38100 - Institutional Structure and Behavior

Offered irregularly.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 38101 - Contemporary Issues in the Workplace

Sociological analysis of contemporary and historical research about work and its social-organizational context, explanations for the degree of meaning, satisfaction, and autonomy people find in their work, and the implications of particular workplace practices. Requirements can include class discussions of required readings, homework, essay exams, oral presentations, and research project.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 38102 - Work and Family

Sociological analysis of how work and family can affect life chances, reinforce gender roles and cultural stereotypes, and widen inequality. Examines how public policy and workplace practices can affect individuals' experiences with work and family. Requirements can include class discussions of required readings, homework, essay exams, oral presentations, and research project.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 38103 - Race and Ethnicity in International Perspective

Race and ethnicity are key dimensions of stratification in society. This course examines competing theories and definitions of race and ethnicity. Using case studies, it looks at the social construction of race and ethnicity in different societies around the world during different eras.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SOC 105.

SOC 38106 - Selected Topics in Comparative Sociology

Credits: 3.

SOC 38107 - Justice, Law, and Society

This course looks at theories about law, the practical application of law in the justice system, and peoples' own perceptions of the law. It explores how those aspects of law often differ from one another and considers the implications of those gaps in understandings. Typically one term paper of 12-15 pages, two essay exams, and one oral classroom presentation.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 38144 - School and American Societies/Sociology of Education

Analysis of selected social, political and economic forces that influence the school as an institution, and in turn are influenced by the school, especially in urban settings. Special attention to immigrant, language

and ethnic minority groups. Required for Early Childhood Education Majors.

Credits: 4. Contact Hours: 4 hrs./wk.

SOC 38200 - Human Groups and Communities

Offered irregularly.

Credits: 3. Contact Hours: 3 hr./wk.

SOC 38201 - Occupations and Professions

Credits: 3.

SOC 38203 - Small Groups

Credits: 3.

SOC 38206 - Aging and Society

Credits: 3.

SOC 38207 - Sex Roles and Social Change

Credits: 3.

SOC 38209 - Sociology of Sexualities

Credits: 3.

SOC 38211 - Drugs and Society

This course examines psychoactive drug use in social and historical context, and includes both illegal and medical drug use. Topics may include: varying patterns of use, addiction and treatment, epidemiology, drug policy and enforcement, drug markets, prescribing practice, and very basic pharmacology (how drugs work in the body).

Credits: 3. Contact Hours: 3 hr./wk.

SPAN - Spanish Course Descriptions

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which is numbered 123, 124 and 226.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

SPAN 12104 - Intro Spanish I

Credits: 4. Contact Hours: 6 hours

SPAN 12204 - Intro Spanish II

Credits: 4. Contact Hours: 6 hours

SPAN 12300 - Introductory Spanish I

An introductory course for non-native speakers using a communicative approach to develop conversational skills and provide the student with a foundation in Spanish grammar, pronunciation and vocabulary.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

SPAN 12400 - Introductory Spanish II

A continuation of Spanish 12300 using a communicative approach to develop conversational skills and provide the student with a foundation in Spanish grammar, pronunciation and vocabulary.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: SPAN 12300 or placement examination.

SPAN 19300 - Spanish for Heritage Speakers and Listeners I

A course designed for heritage speakers and heritage listeners of Spanish who speak and/or understand the language to various degrees. This course emphasizes grammar, reading, writing and vocabulary acquisition.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

SPAN 19400 - Spanish for Heritage Speakers and Listeners II

A further study of the grammatical structure of Spanish with emphasis on the nuances of the target language and more intensive practice in reading, writing and vocabulary acquisition.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: SPAN 19300 or placement examination.

SPAN 22300 - Intermediate

A review of the most important aspects of Spanish grammar, further vocabulary development through conversation and reading.

Credits: 2. Contact Hours: 3 hours

SPAN 22504 - Intermediate Spanish

A one-semester Spanish course at the intermediate level. This course will review the grammar of the Spanish language, enhance vocabulary, and will include literary and cultural readings. It will further develop listening, speaking, reading comprehension, and writing skills through class discussions and the use of multimedia and the Internet.

Credits: 4. Contact Hours: 4hr/wk Prerequisite: SPAN 12204 or placement.

SPAN 22600 - Intermediate Spanish

A one-semester Spanish course at the intermediate level. This course will review the grammar of the Spanish language, enhance vocabulary, and will include literary and cultural readings. It will further develop listening, speaking, reading comprehension, and writing skills through class discussions and the use of multimedia and the Internet.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: SPAN 12400 or placement.

SPAN 28100 - Masterworks of Spanish Literature I

The evolution of Spanish literature from the Medieval period through the Golden Age. Critical analysis of representative works and writers.

Credits: 3. Contact Hours: 3 hr./wk.

SPAN 28200 - Masterworks of Spanish Literature II

The development of Spanish literature during the 18th and 19th centuries. Critical analysis of representative works, writers and movements.

Credits: 3. Contact Hours: 3 hr./wk.

SPAN 28300 - Masterworks of Latin American Literature

Representative works and authors of Spanish American letters from the mid 20th century to the present. The texts are analyzed in light of the social, political, cultural and ideological contexts in which they were produced.

Credits: 3. Contact Hours: 3 hr./wk.

SPAN 29000 - Spanish for the Health Professions

Designed for students looking to work in the health and related professions who wish to acquire the basic tools for effective communication in Spanish. Assumes no prior knowledge of Spanish and allows students to focus on acquiring relevant vocabulary, some basic grammar, and cultural competency with the goal of facilitating basic communication with Spanish speakers. Students practice using these communicative skills within the context of specific professional situations. Includes a brief introduction to the cultures of the hispanophone world. Taught in English. This class is not open to Spanish majors or minors and does not fulfill the CCNY language requirement.

Credits: 3. Contact Hours: 3 hr./wk.

SPAN 30100-30300 - Honors I-III

Approval of Dean and the Department Honors Supervisor required. Apply no later than December 10 in the Fall term or May 1 in the Spring term.

Credits: 1-4. Contact Hours: Variable cr., 1-4

SPAN 31000 - Independent Study

For students with special literary or linguistic interests who desire to pursue independent study and research. For juniors and seniors, ordinarily.

Credits: 1-4. Contact Hours: Variable cr., 1-4 Prerequisite: Departmental approval required.

SPAN 31100-32000 - Selected Topics

A series of advanced courses to be offered with varying frequency on selected topics not generally covered in the set course offerings. Topics to be announced in the preceding semester.

Credits: 1-3. Contact Hours: 1-3 hr./wk. Prerequisite: SPAN 32100 or SPAN 32200.

SPAN 32100 - Problems of Spanish Grammar

An advanced look at Spanish grammar focusing on description and explanation of selected Spanish syntactic phenomena such as uses of infinitive *ser/estar*, the order of major constituents, uses of *se*, and uses of the subjunctive. Students will analyze Spanish syntax increase their understanding of the structure of Spanish and develop stylistically correct Spanish prose. Students are advised to take SPAN 37300, Advanced Spanish Composition & Conversation, prior to this course or in the same semester.

Credits: 3. Contact Hours: 3 hr./wk.

SPAN 32200 - Practice in Writing Spanish

An intensive course in written Spanish, with stress on correct structure of descriptive, narrative and expository prose.

Credits: 3. Contact Hours: 3 hr./wk.

SPAN 32300 - Spanish Conversation

Development of speaking skills through discussion of current topics (not open to native speakers).

Credits: 3. Contact Hours: 4 hr./wk.

SPAN 32400 - Translation

Development of skills in the art of translation from English to Spanish and vice versa through the use of a wide range of materials.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32401 or placement exam or permission of the instructor. SPAN 32100Corequisite: SPAN 32200

SPAN 32401 - Studies in Translation I

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100Corequisite: SPAN 32200

SPAN 32402 - Studies in Translation II

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100Corequisite: SPAN 32200

SPAN 32500 - Spanish Phonetics and Phonology

A study of phonetic transcription and phonetic and phonological theory in the different Spanish-speaking areas. Especially recommended for students who plan to teach Spanish.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100Corequisite: SPAN 32200

SPAN 32600 - Spanish in the Business World

Development of technical vocabulary and forms of expression used in the world of commerce, economics and finance.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100Corequisite: SPAN 32200

SPAN 32700 - Introduction to Spanish Linguistics

A presentation of the tools and methods of modern linguistics and their application to the study of the phonological, morphological and syntactic characteristics of contemporary Spanish, especially those related to Spanish in the Americas.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100Corequisite: SPAN 32200

SPAN 33000 - Representations of Contemporary Spain in its Cinema

This course is designed to introduce students to major social, historical, and cultural issues in Spain since the end of the Franco dictatorship in 1975, through an exploration of some of the most outstanding films of the contemporary period. Class discussions may be held either in English or Spanish or both.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 22400, SPAN 22500 or permission of the instructor. SPAN 32100Corequisite: SPAN 32200

SPAN 33100 - Representations of Latin America Through its Cinema

This course will analyze various aspects of the culture and society of Latin American countries through film. A careful selection of movies and texts presented in class will help students improve their ability to read films aesthetically, culturally, and historically. Cultural and social aspects such as the role of women in Latin American society, political ideologies, social and economic structures, power institutions, e.g. the Catholic Church, the State, drug lords, etc, will be examined and discussed through a systematic study of films selected.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 22400/SPAN 22500 or permission of chairperson or instructor. SPAN 32100Corequisite: SPAN 32200

SPAN 35100 - Studies in Spanish Literature I

A survey of the literature of Spain from the Middle Ages to the end of the 17th century, with emphasis on the different styles and periods and on the characteristics of representative genres.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100Corequisite: SPAN 32200

SPAN 35200 - Studies in Spanish Literature II

A survey of the literature of Spain from the 18th century to the present, with emphasis on the different styles and periods and on the characteristics of representative genres.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100Corequisite: SPAN 32200

SPAN 35300 - Studies in Spanish American Literature

An overview of the development of Spanish American literature since its origins to contemporary times. This course will emphasize the literary trends and cultural currents that have shaped Spanish-American letters through the analysis of representative works.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100Corequisite: SPAN 32200

SPAN 35400 - Dominican Literature and Culture

This course will use a variety of texts including the novel, the essay, the short story, popular poetry, representations of the oral tradition, paintings, music, films, to provide students with a unique opportunity to learn about some of the first literary and cultural manifestations in the Dominican Republic. Readings will cover selections from Columbus Diary and letters, and other selections from chronicles. The course will

also focus on how Dominican intellectuals have incorporated modern artistic trends into their creations.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 22400 and SPAN 22500. SPAN 32100 Corequisite: SPAN 32200

SPAN 36000 - Techniques for Literary Analysis

The study of critical techniques and terminology for the analysis of different literary genres and contemporary criticism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 Corequisite: SPAN 32200

SPAN 37000 - History of the Spanish Language

Study of the development of the Spanish language from Latin to the present, including language contact, especially in the area of lexicology.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32700 or LING 22100, SPAN 32500 or EDUC 35000, SPAN 32100 or permission of the instructor. LAT 12100 strongly recommended. Corequisite: SPAN 32200

SPAN 37300 - Advanced Spanish Composition & Conversation

This course is required for Bilingual Education majors. The course will develop and improve the students' capacity to express themselves in writing and speech utilizing various techniques.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: It is recommended that students take this course prior to or concurrently with SPAN 32100, Problems of Spanish Grammar.

SPAN 37400 - Lit For Young Adults

This course is intended for prospective Middle School and High School teachers and all of those interested in this type of literature. The course will incorporate a selection of readings in Spanish-language literature in several genres. The primary goal will be to have participants become familiar with a body of literary works to be read in their Spanish classes at Middle and High School levels. Students will analyze and write about literature and use cultural and historical insight.

Credits: 3. Contact Hours: 3 hours

SPAN 390 - Seminario Mario Vargas Llosa

This one-credit seminar offered through the Cátedra Mario Vargas Llosa at the Department of Classical and Modern Languages and Literatures focuses on the work of 2010 Nobel Prize winner and its impact on Hispanic and World Literature through the analysis of selected novels, short-stories and essays in print and other media. The course is run by the Department of Classical and Modern Languages and Literatures and is taught by a rotating series of invited world-renowned and award-winning writers and critics. Generally taught in Spanish, it is open to both undergraduate and graduate students. Because the instructor and topic of the course are different each year, students may repeat the seminar for credit.

SPAN 42100 - Studies in Medieval Spanish Literature

A literary and linguistic analysis of the major texts of the medieval period, including "cantigas," *Poema del Cid*, *Milagros de Nuestra Señora*, *Libro de Buen Amor*, and *La Celestina*.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 42400 - Cervantes: Don Quijote

An exploration of Cervantes' major work from different critical points of view.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 42600 - Golden Age of Spanish

The study of the major literary and ideological currents that developed in Spain during the Renaissance and the Baroque periods along with the reading and analysis of representative works.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 42601 - Lope de Vega and the Evolution of the Spanish Theatre

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 42602 - Renaissance and Baroque Prose and Poetry

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 42800 - Spanish Literature of the 18th and 19th Centuries

Representative authors and main currents in prose, poetry and drama from various periods: Neoclassicism, Romanticism, Realism and Naturalism.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 43200 - The Generation of 1898

Ideas and themes in the works of Unamuno, Azorín, Baroja, Valle Inclán and other major writers of this period.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 43400 - Studies in Contemporary Spanish Literature

An exploration of the major trends in Spanish Literature of the 20th century through the study of different genres.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 43401 - The Spanish Novel since the Civil War

Credits: 3. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 43402 - Contemporary Spanish Poetry and Theater

Credits: 3. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 43600 - Spanish American Colonial Literature

The formation and development of colonial discourse focusing on how indigenous and foreign modes interacted in order to represent a complex reality.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 43800 - Spanish American Literature of the 19th Century

A study of literary currents of 19th century Spanish America through its major works.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 44100 - The Literature of Social Protest in Spanish America

A study of literary works from different genres focusing on how they portray and respond to a given social, political and/or economic situation.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 44200 - The Spanish American Essay

The evolution of the essay from the period of independence to the present, taking into account the philosophical currents and historical events that have shaped this genre.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 44400 - Studies in Contemporary Spanish American Literature

Major developments in narrative, poetry and theater from the early 20th century to the present.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 44402 - Contemporary Spanish American Poetry and Theater

Credits: 3. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 44403 - Contemporary Spanish American Short Story

Credits: 3. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 44404 - The Spanish American Contemporary Novel

Credits: 3. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 44600 - Literature of the Spanish Caribbean

Differences and similarities in the cultural and social structures of Cuba, Puerto Rico and the Dominican Republic through the analysis of selected texts of various genres.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 45100 - Spanish Civilization

An exploration of Spanish history and culture from their origins to the present. Topics include geography, folklore, development of the arts, ideologies, socio-political changes and social issues.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 45200 - Topics in Spanish American Civilization

A study of the social, cultural and political developments of Spanish America. Topics include the contributions of the Native, Iberian and African civilizations; the struggle for independence; the development of the arts; the impact of revolutionary movements; and the place of women in society.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 45201 - Topics in Spanish American Civilization I

Credits: 3. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 45202 - Topics in Spanish American Civilization II

Credits: 3. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 45300 - Gender Issues in Hispanic Letters

An exploration of the impact of gender in the literature of the Spanish-speaking world.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 45400 - Latino Culture and Literature in the U.S.

An exploration of the Latino cultural legacy and its contemporary influence in the United States. The study of the development of Latino communities, history and patterns of immigration, and similarities and differences among these communities. This course will also focus on sociological, economic, political and anthropological factors such as transculturation, assimilation, linguistic similarities, problems of identity and discrimination. It will also examine various psychological factors of the Latino cultures throughout the U.S. through the different ways of expression such as art and literature, taking into account the elements that distinguish these from those of their countries of origin and North America. The course will normally be conducted in Spanish. Readings may be in Spanish and English.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 46200 - Spanish Dialectology and Sociolinguistics

This course examines regional and social variation in the Spanish of Spain and Latin America. It examines variable phenomena in Spanish phonology and morphosyntax, and correlates them with predictive factors such as region, nationality, level of education, sex, and age. Also included is a look at such areas as language attitudes, policy and planning, and discourse analysis.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 46301 - Spanish in Contact Worldwide

This course examines varieties Spanish spoken in areas where another language is also in widespread use, in Latin America, Spain, North America and other areas where Spanish is spoken. The course considers some of the linguistic and sociocultural effects of bilingualism. Through readings, multimedia materials, and web-based interactive discussions, students learn to appreciate, describe, and compare different varieties of Spanish in contact as they learn to think critically in the field.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPAN 46302 - Spanish in Contact in the US

The course examines varieties of Spanish spoken in the continental United States, focusing on variable phenomena and on the role of the home dialects in shaping US varieties. Special emphasis is placed on contact with English and on the public policy and educational consequences of the widespread use of Spanish in the US.

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: SPAN 32100 and SPAN 32200

SPCH - Speech Course Descriptions

SPCH 11100 - Foundations of Speech Communication

Basic skills in extemporaneous speaking, oral reading, small group communication, interview techniques and listening. Each student will have at least one performance recorded. Students who have completed SPCH 00380 may not take this course. Sections specifically tailored for Honors and SEEK students are occasionally available.

Credits: 3. Contact Hours: 3 hr./wk.

SPCH 11104 - Speech Foundations

Credits: 4. Contact Hours: 4 hours

SPCH 11400 - Oral Interpretation

Theory and practice in reading aloud.

Credits: 3. Contact Hours: 3 hr./wk.

SPCH 13300 - Articulation

Primarily for students whose English is difficult to understand owing to foreign accent, dialect or incorrect learning.

Credits: 1. Contact Hours: 2 hr./wk.

SPCH 23300 - Voice and Diction

Effective self-expression in communication, with emphasis on voice, diction and vocabulary.

Credits: 3. Contact Hours: 3 hr./wk.

SPCH 35104 - Argumentation

This course will help participants understand the characteristics of young children with autism spectrum disorders, the effects of having a child with autism in the family, parental roles, and intervention approaches designed to meet the special needs of this population.

Credits: 4. Contact Hours: 4hr/wk.

SPED - Secondary Education Course Descriptions

SPED 32000 - Introduction to Inclusive Education

An introduction to the multiple meanings of inclusive education as employed in both national and international contexts. Specific attention is paid to school structure, legislative mandates in support of inclusive education, collaborative problem solving relationships among educators, students and families in designing and modeling inclusive pedagogies and practices for diverse learners. Includes 15 hours of fieldwork for all students who are not majors in special education.

Credits: 3. Contact Hours: 3hr./wk

SSC - Social Science Course Descriptions

SSC 31200 - Internship

This seminar introduces students to concepts and tools for understanding and evaluating leadership and organizational management. The internship placement site will serve as a case study for examining the issues and challenges faced by leaders in the public and/or private sector(s). Readings, interviews and class discussions will serve to explore questions such as:

- How do leaders make decisions in the face of uncertainty, when action is required without adequate information?
- How do leaders measure performance to ensure that their pro-grams and services are working?
- How do they involve diverse stakeholders and constituencies with varying expectations and ideas- in co-creating, implementing and evaluating program strategy?
- To whom or what are these leaders accountable?
- How do they deliver quality, high impact services in the face of resource constraints?

Students will explore these challenges in the varying contexts of public service be they nonprofit, private for profit, philanthropic, government and faith-based institutions – and the social, economic and political forces with which they must contend. Concepts and tools such as theory of change, logic modeling, service blueprinting and performance rubrics will be introduced each week during class meetings and students, over the course of the semester, will apply these tools in constructing an organizational profile of their internship site. All Internship Placements must be approved by the Internship Director. Co-requisite: Community Change Studies Internship Recitation.

Credits: 3. Contact Hours: 3 Corequisite: SSC 31201

SSC 31201 - Community Change Studies Internship Recitation

An opportunity to expand on the topics covered in the Internship class to discuss with issues arising specific to community change organizations.

Credits: 1. Contact Hours: 1 Corequisite: SSC 31200: Internship

THTR - Theatre Course Descriptions

30000-level and above courses may be taken only with faculty permission. All Theatre courses carry the designation THTR.

THTR 11300 - Stage Makeup

The fundamentals of stage appearance, stage lights and audience proximity. Basic and painted illusion. Face proportion, base colors, proper tools and materials.

Credits: 1. Contact Hours: 2 hr./wk. plus hrs. to be arranged.

THTR 12700 - Speech for the Stage

Focusing on developing breath control, resonance and articulation. Introductory phonetics and physiology of speech, followed by the analysis and reading aloud of selected fictional texts. This course may be taken two times for credit.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 13100 - Introduction to Theatre Arts

The related creative arts of playwright, director, actor and designer; their collective contributions to the form of the play that ultimately evolves on stage. Discussion of the institutions in contemporary American theatre.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 13200 - Body Movement

Techniques to free and relax the actor's body, connect mental imagery with physical expression, and combine movement with speech. Elementary modern dance. This course may be taken two times for credit.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 13300 - Stagecraft

Credits: 4. Contact Hours: 4 hours

THTR 13400 - Basic Production and Design

Introduction to all facets of technical theatre. Topics include the design and production of scenery, costumes, lighting, and props, as well as stage management. There will be hands-on experience in backstage facilities in Compton-Goethals and Aaron Davis Hall. In addition to regular class meeting times, students are required to serve as crew member on one departmental production during the course of the semester.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 13600 - Beginning Acting

Principles and practice of acting. Introduction to relaxation, concentration, self awareness, inner objects, outer activities, objectives and obstacles, ensemble work, circle of belief, text analysis. Consideration of work ethic and professionalism. Basic scene and monologue exploration.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 21100 - Theatre History I

The development of theatre and drama from tribal origins to 1640 (including Egyptian, Greek, Roman and Medieval/Renaissance periods). May not be taken concurrently with THTR 21200 or THTR 21300.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 21200 - Theatre History II

The development of theatre and drama from 1640 to 1900, including Jacobean, Restoration, Romanticism, Early Melodrama, Naturalism. May not be taken concurrently with THTR 21100 or THTR 21300.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 21300 - Theatre History III

The study of plays and production styles prevalent throughout the Twentieth and Twenty-First Centuries in Europe and America. This course will consider a selection of important plays and such important movements as: Symbolism, Futurism, Dada, Surrealism, Expressionism, Theatre of the Absurd, Theatre of Images, the rise of the Broadway musical, the Off-Off Broadway theatre movement, the rise of Afro-American and Latino schools of writing and production, New German Realism, Post-Modernism, etc. May not be taken concurrently with THTR 21100 or THTR 21300.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 21400 - Dramaturgy

An introduction to the role of dramaturgy and the dramaturg in American Theatre. The dramaturg assists the director in analyzing the playtext and the playwright in developing their original play through various stages and in doing historical and production research. Combining theory with practical application, students will work as a dramaturg for a variety of individual and collective class assignments.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 21500 - Musical Theatre History

A brief historical overview of the development of musical theatre in the United States from the late 1800s through the twenty-first century.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 21600 - Non-Western Drama

A survey of non-western traditional theatrical forms and contemporary drama from around the world. By examining plays, films and readings from a global perspective, this course aims to expand the student's understanding of the contemporary world through appreciation of other cultures.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 21700 - Queer Theatre

An exploration of GLBT identity as portrayed in predominantly American dramas of the past century. Exploration of key figures and texts, starting with Oscar Wilde. Consideration of stereotypical and groundbreaking portrayals of gay people; explores plays with themes of homophobia, self-hatred, acceptance, AIDS, familial interaction, and the evolution of the GLBT rights movement in a hetero-normative society.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 21800 - American Jewish Theatre

This course explores Jewish identity as portrayed in twentieth and twenty-first century United States drama and musicals. Consideration of Yiddish theatre; the impact of black-face minstrelsy on Jewish artists; plays dealing with anti-Semitism, assimilation, generational conflict, and the counterpoint of outward success and inward disappointment. These works are all fused to a historical overview of Jews and Jewish culture in America.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 21900 - Theatre of the Sixties

This course is an exploration of the predominant themes and concerns of 1960's American Popular Culture through the reading of plays and musicals of that time period. The selected subject matter will be supplemented with the viewing of several films outside of class time, plus the assignment of novels, nonfiction works, and essays of the period. The predominant themes of the period (women's rights, the civil rights movement, the gay pride movement, the sexual revolution, and so forth) will be surveyed.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 22000 - Women's Theatre

This course will examine the development of a female dramatic tradition throughout the world. Students will gain an overview of women's roles in writing and creating theatre by examining plays by women, theoretical pieces relating to the plays and playwrights, as well as historical materials relating to the contextualization of the dramatic literature.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 22200 - Playwrights and the Pulitzer Prize

Through close readings of their plays and an examination of their historical contexts, we will study dramatists who have won the Pulitzer Prize. Students will explore how the literary works of these playwrights

have both influenced and been influenced by the ideas of the twentieth and early twenty-first centuries.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 22300 - Theatre into Film

This course will explore the similarities and differences between two art forms. We will study a series of noteworthy playscripts that have been adapted into films. Consideration will be given to the disparate nature of the theatrical and cinematic modes of expression as well as to the art of adaptation itself. In each case the class will study the play as text and view the film which grew out of it.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 22800 - Contemporary Latin American Theatre

An introduction into the playwriting and production trends in Latin America over the course of the last sixty years. Consideration will be given to issues of dramatic structure, post-colonial theory and historical background, and influences from North America and Europe. This course will attempt to address specific characteristics of national theatres of the region and areas of commonality amongst them. Script analysis will be coupled with production analysis based on dvds of productions where available.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 23200 - Black Theatre, U.S.A. I

Spanning the period, 1821-1950, this introductory course offers an intensive exploration and analysis of the evolution of black dramatic literature in the United States of America. Through the process of close reading of dramatic texts, this course will offer insights into the movements, institutions, actors, playwrights and other related artists contributing to African-American theatre.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 23201 - Black Theatre, U.S.A. II

Focusing on the contemporary period, from 1950 to the present, this introductory course examines the development of recent African American drama. Through the process of close reading of dramatic texts, this course will focus on the contributions of African-American playwrights, actors, designers, critics, and producers.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 23300 - Directing I

Introduction to techniques of directing actors; scene and beat analysis; creative considerations of setting, properties, staging, and dramatic rhythm.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: THTR 13600.

THTR 23600 - Acting Realism

Continuation and development of improvisation and monologues with intensive work on study of scenes from the modern realistic and naturalistic repertoire.

Credits: 4. Contact Hours: This course may be taken two times for credit. 4 hr./wk. Prerequisite: THTR 13600 or permission of the Department.

THTR 23601 - Acting the Classics

Work on classical and modern poetic schools of dramatic works, featuring in-depth exploration of theatrical language, including consideration of emphasis, meter, connecting breath with thought, verbal imagery, and word-as-action. Two-character scenes and monologues and soliloquies are required.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: THTR 13600 or permission of the department.

THTR 23602 - Auditioning and Acting Professionalization

This course emphasizes auditioning for professional theatre and cinema. Consideration is given to building a repertoire, developing a resume,

professional comportment, etc. The student will have experience in both the presentation of monologues and in doing cold readings.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: THTR 23600 or permission of the instructor.

THTR 23700 - Tech Theater Practic

Guided individual work in one of the following areas: Stage Management, Costume Design and Construction, Set Design, Painting, and Construction, Stage Lighting, Property Construction and Acquisition, Sound Design.

Credits: 3. Contact Hours: 3 hours

THTR 23701-23703 - Technical Theatre Practicum

Guided individual work in one of the following areas: Stage Management, Costume Design and Construction, Set Design, Painting, and Construction, Stage Lighting, Property Construction and Acquisition, Sound Design. This course may be taken up to eighteen credits. By permission of the department.

Credits: 1-3. Contact Hours: Variable hours; 1-3 cr./sem.

THTR 23800 - Musical Theatre Workshop

This course emphasizes acting through singing. The students will gain familiarity with the various genres of songs within the musical comedy rubric and gain experience in performing them. There will also be choral work and an elementary workshop in jazz dance. This course may be taken two times for credit.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 23900 - Acting for the Camera

Students, using extant film scenarios, act in scenes from movies and gain practice in acting for television dramas and commercials. Performances are video-taped, played back, and analyzed. This course may be taken two times for credit.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 24000 - Stage Combat

Introducing students to the art of stage combat. Begins with basic exercises and culminates in a comprehensive and choreographed scene. Students learn the importance of partnering, discipline, and the difference between actual violence and effective illusion. Emphasis is on safety, acting values and telling the story of the fight in a theatrical setting. This course may be taken 2 times for credit.

Credits: 3. Contact Hours: 4hr./wk.

THTR 25000 - Ballet

The fundamentals of classical ballet, including intense barre and floor work on basic steps and positions as well as consideration of the history of ballet, from its roots as a court diversion to its present hybrid manifestations. This dance form will be placed in its context as a mode of theatrical expression, as a means to tell a story, to symbolize the full range of human emotion, and as abstract movement. Students will gain basic mastery as well as train and discipline their bodies.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 25100 - Jazz Dance

Emphasis will be placed on perfecting basic dance techniques, creating basic jazz compositions, and developing a more in-depth understanding of the historical development of American jazz dance from its African, social and modern dance roots to its contemporary influences and its symbiosis with American Musical Theatre.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 25200 - Modern Dance

Students will work to develop alert, strong and intelligent bodies. They will be exposed to a variety of approaches to dance technique and aesthetics. The students will learn through improvisation to develop

movement material, to work alone and in collaboration with others. Students will increase their strength, suppleness and grace through a series of warm-ups, energetic center floor exercises, and spatially oriented movement.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 25300 - Tai Chi

Tai Chi Chuan is an ancient Chinese exercise based on centering and balance which has proven helpful to strengthen the body, increase flexibility, develop patience, and discipline the mind. Students will be instructed in the first of the three parts of the classical form, a series of slow rhythmic movements that center and integrate the mind and body.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 25400 - Suzuki/Viewpoints Actor Training

An introduction to Tadashi Suzuki's physical and vocal discipline and Anne Bogart's actor/director collaborative system, Viewpoints. The physical exercises aim to increase physical stamina, strengthen the body and develop an intuitive awareness of the actor's body in space.

Credits: 3. Contact Hours: 4 hr./wk.

THTR 25500 - Youth Theatre

This course will explore the unique and nuanced performance and playwriting techniques required in performing Theatre for Youth. This course will expose students to a broad range of dramatic activities, directing and teaching strategies to help prepare you for work as a Teaching Artist and obtain experience-leading activities. Students will develop confidence creating and facilitating rehearsals, schedules, production meetings, aspects of technical theater and other activities relating to directing students in theatre.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 26000 - Lighting Design

An introduction to the art of lighting design. Students will learn how to determine the lighting needs in a given dramatic text and venue; the equipment and materials employed; basic lighting drafting; the use of color; lighting technology.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 26100 - Costume Design

An introduction to the art of costume design. Students will learn how to determine the costume needs in a given dramatic text and venue; the equipment and materials employed; basic costume design drafting; the respective skills in costume construction, pulling, and purchasing. Attention will be given to style and period. Priorities will be given both to research and imaginative exercises.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 26200 - Set Design

An introduction to the art of set design. Students will learn how to determine the set needs in a given dramatic text and venue; the equipment and materials employed; basic set design drafting; the use of color, texture, shaping of space.

Credits: 3. Contact Hours: 3 hr./wk.

THTR 30100-30300 - Honors

Credits: Variable cr.. Contact Hours: usually 3 cr./per sem. Prerequisite: May be taken only with faculty permission

THTR 31000 - Independent Study

Upper level work on issues of dramatic literature, theatre history, and criticism. Permission of program advisor required.

Credits: Variable cr.. Prerequisite: May be taken only with faculty permission

THTR 31100-32000 - Selected Topics

Advanced study in selected topics and problems chosen from areas of theatre with emphasis upon aspects not treated in regular courses.

Credits: Hours and credits to be arranged.. Prerequisite: May be taken only with faculty permission

THTR 31125 - Children'S Theatre

Credits: 3. Contact Hours: 3 hours

THTR 31209 - From Page to Stage

This course will focus on close examination of play scripts and the directorial concept. Students will study at least 3 major works of the theater including one currently in production in NYC and will meet with and have structured discussions with professional actors, directors and designers. Students will analyze production concepts and create a final project as director and designer. Both textbook and theater ticket purchases will be required for this course.

Credits: 4. Contact Hours: 4hr/wk

THTR 33000 - Performance Practice

Active participation in the production of a play either as actor, assistant director or as a member of the technical crew. Open to all students in the college. By audition. Permission of faculty advisor required. May be taken up to eight times for credit.

Credits: 2. Contact Hours: 20 hr. rehearsal/wk.; 4 performances
Prerequisite: May be taken only with faculty permission

THTR 33100 - Playwriting

Development of skills in writing for the theatre; practice in developing dramatic situations, dialogue, building characters, etc. This course may be taken two times for credit.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: May be taken only with faculty permission

THTR 33300 - Directing II

Advanced course in directing, utilizing extended and more complex scenes and texts. Students direct a one-act play.

Credits: 3. Contact Hours: 4 hr./wk. Prerequisite: THTR 23300 or permission of the Department. May be taken only with faculty permission

THTR 33600 - Performance Practice in Film

The student performs in one or several student films and/or videos sponsored by the Film and Video programs. Ultimately presents a portfolio of work and a journal to selected theatre faculty for evaluation. This course may be taken three times for credit. Permission of the department required.

Credits: Variable. Contact Hours: 3 hr./wk. Prerequisite: May be taken only with faculty permission

THTR 37000 - Special Problems in Directing

The student directs a full-length theatrical work under faculty guidance. Permission of major advisor required.

Credits: 3. Contact Hours: Hours variable Prerequisite: THTR 33300. May be taken only with faculty permission

THTR 37100 - Special Problems in Playwriting

The student writes a full-length theatre work under faculty supervision. Permission of major advisor required. This course may be taken two times for credit.

Credits: 3. Contact Hours: Hours variable Prerequisite: THTR 33100 (taken twice) or ENGL 32201. May be taken only with faculty permission

THTR 37200 - Special Problems in Technical Theatre and Design

Guided work on a project of substantial scale, either in costume, lighting, set, or sound design, stage management or extensive apprenticeship in technical crews. Permission of program advisor and technical director required. May be taken up to four times.

Credits: 3. Contact Hours: Hours variable Prerequisite: THTR 13400. May be taken only with faculty permission

THTR 43000 - Theatre Workshop

Creative work in both acting and directing for advanced students who demonstrate outstanding talent. Permission of the Department required.

Credits: 3. Contact Hours: May be taken up to three times for a total of 9 cr.

THTR 43100 - Internship in Theatre

Involves work at a theatre or theatre organization outside the college environment. The work could be in (1) theatre management and administration, (2) technical theatre, (3) various creative areas, including acting, directing and design. The Theatre Advisors must approve the outside organization as well as a coherent plan for the nature and quality of the work the student proposes to do. Ultimately, the student presents to their campus advisor a portfolio or journal chronicling their internship work as confirmed by the on-site supervisor.

Credits: 1-3. Contact Hours: THTR 43101: 2 hr./wk.; 1 cr.: THTR 43102: 4 hr./wk.; 2 cr.: THTR 43103: 6 hr./wk. 3cr

THTR 43200 - New Play Collaborations

This class will explore the creative, collaborative process, and will be comprised of sets of actors, directors and playwrights who will team up to create a number of original works for the stage. The semester will culminate in a public presentation of the work. May be taken up to 3 times for credit for a total of 9 credits

Credits: 3. Contact Hours: 3 hr./wk. Prerequisite: THTR 13600. Registration by permission of the Instructor.

THTR 44405 - Dramaturgy

Credits: 3. Contact Hours: 3 hours

THTR 45000 - Special Topics in Dramatic Literature

Specialized study of specific playwrights, genres, and historical periods of dramaturgy.

Credits: 3. Contact Hours: 3 hr/wk. Prerequisite: ENGL 11000.

THTR 45004 - Theatre On Film

Credits: 3. Contact Hours: 3 hours

THTR 45010 - Non-Western Drama

Credits: 3. Contact Hours: 3 hours

USSO - History Course Descriptions

USSO 10100 - Development of the U.S. and its People

Analysis of how a powerful nation-state evolved from a tiny offshoot of European colonial expansion. Elucidates major forces that have shaped the modern world: religion, land policies, technology, industrial capitalism, democracy, nationalism, socialism, racism, sexism, and imperialism.

Credits: 3. Contact Hours: 3 hr./wk.

USSO 10101 - Development of the U.S. and its People (Honors)

For students in the City College Honors Program and the Macaulay Honors College. An alternative version of the introductory course designed to provide more student participation and writing.

Credits: 3.

USSO 44600 - The American Health Care System

The development of modern medicine, and the politics, economics, and organization of the current American health care system. Issues include whether the health care system favors the wealthy over the poor, discriminates against women, and results in the overutilization of drugs, surgery and hospitals.

Credits: 4. Contact Hours: 4 hr./wk.

WCIV - Pathways Course Descriptions

WCIV 10100 - Prehistory to 1500 A.D.

An examination of the civilizations of Asia, Africa, Europe and the Americas through a comparative study of selected places and themes. The dynamics of hunter/gatherer, pastoral and agrarian societies, urbanization, trade, imperialism, slavery, feudalism, the centralization of the state, religion and secular thought are among the topics discussed.

Credits: 3. Contact Hours: 3 hr./wk.

WCIV 10101 - World Civilizations (Honors)

For students in the City College Honors Program and the Macaulay Honors College. A transcultural, geographically and regionally balanced study of specific themes found in both WCIV 10100 and WCIV 10200 courses. Emphasis on a theoretical perspective of the topics and their significance today.

Credits: 3. Contact Hours: 3 hr./wk.

WCIV 10200 - 1500 A.D. to the Present

A study of the major forces that have shaped the modern world of Asia, Africa, Europe and the Americas. Selected themes include the interaction of the Western and non-Western world, the scientific revolution, capitalism, imperialism, industrialization, economic growth and stagnation, revolutions, counter-revolutions, modern political ideologies, the global crisis of the 20th century and emerging global interdependence.

Credits: 3. Contact Hours: 3 hr./wk.

WCIV 10201 - World Civil II: 1500AD-Present

An enhanced version of WCIV 10200 for students in the Honors Program. A study of the major forces that have shaped the modern world of Asia, Africa, Europe, and the Americas. Selected themes include the interaction of the Western and non-Western world, the scientific revolution, capitalism, imperialism, industrialization, economic growth and stagnation, revolutions, counter-revolutions, modern political ideologies, the global crises of the 20th century, and emerging global interdependence.

Credits: 3. Contact Hours: 3 hours

WHUM - Pathways Course Descriptions

WHUM 10100 - World Humanities I

An introduction to world literature and its relationship to the traditions and societies from which it springs. Study of major works from antiquity to the seventeenth century.

Credits: 3.

WHUM 10101 - Literature in the Human Experience (Honors)

For students in the City College Honors Program and the Macaulay Honors College. Defines what literature is and determines its relationship to human existence. The various types of literature and the role of form and structure in the meaning of the whole. Literature as a mirror of the variety and continuity of human experience. Extensive reading and individualized writing assignments.

Credits: 3. Contact Hours: 3 hr./wk.

WHUM 10200 - World Humanities II

An introduction to world literature and its relationship to the traditions and societies which it springs. Study of major works from the eighteenth century to the contemporary period.

Credits: 3. Contact Hours: 3hr./wk.

WHUM 10201 - World Humanities II (Honors)

For students in the City College Honors Program and the Macaulay Honors College.

WHUM 10312 - Modern World Literature

Modern World Literature

Credits: 3. Contact Hours: 3 hr./wk.

WHUM 10321 - Modern World Literature (Global English Literature, Honors)

An enhanced version of WHUM 10312 for students in the Honors Program. A study of modern world literature through the works of contemporary Anglophone writers from Asia, Africa, the Caribbean, and Australia. Topics include the condition of post-colonialism as well as the more recent globalization of English and thus the globalization of literature in English.

WS - Women's Studies Course Descriptions

WS 10000 - Women's/Gender Roles in Contemporary Society

An introduction to issues that arise when women's lives and gender roles become the focus of critical inquiry. How do different societies and academic disciplines define women? How do women's experiences vary in relation to factors such as race, ethnicity, class, sexuality, age and nationality? How have women resisted, adapted to, and transformed "women's space" in the United States and elsewhere?

Credits: 3. Contact Hours: 3 hr./wk.

WS 10004 - Introduction to Women's and Gender Studies

This course is designed to develop a cross-cultural understanding of gender relations as historical practices of inequality. Students discuss the ways in which dominant definitions of gender roles and relations emerge in different societies at different historical moments, using findings of various interdisciplinary inquiries, such as history, psychology, sociology and fiction. Questions to be explored aim to move the learner beyond essentialism that takes sexual identity for granted. Also considered are cultural consequences of biological differences and sexual stereotypes in the media. A large portion of the class is devoted to historical and geographical survey of complex dynamics of gender relations, multiplicity of ideas about the roles that men and women perform, and values associated with these activities in various cultural settings. The dynamics of gender relations will be examined to see how gender is socially constructed and what the constraints of such constructions are on both women and men, in terms of legal positions, education, professional opportunities, family and ethnicity.

Credits: 4. Contact Hours: 4hr/wk

WS 31001-31004 - Independent Study

The student will pursue a program of independent study under the direction of a member of the program with the approval of the Program Director.

Credits: 1-4. Contact Hours: 1-4 hr./wk.

WS 31100-32000 - Selected Topics in Women's Studies

Topics not covered in the usual program offerings. Topics will vary from semester to semester depending upon student and instructor interest. Credits and hours will be determined by the instructor and the program.

Credits: 1-4. Contact Hours: 1-4 hr./wk.

WS 31894 - Latinas in Transition

This course will provide a framework for understanding Latinas as a diverse group of women that may share a common heritage from Spain, Africa, and/or Indigenous Nations, but with a particular heritage from their countries, which distinguishes them from each other. The experiences of Latinas will be examined in terms of how their migratory historical, cultural, psycho-social, political and economic experiences shape their everyday lives in NYC. Further, attention will be given to the changing role of women and men as well as the impact of class, race and gender.

Credits: 4. Contact Hours: 4hr/wk

YID - Yiddish Course Descriptions

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which are numbered 12300, 12400 and 22600.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

YID 12300 - Introductory Yiddish I

Offers students the opportunity to explore the language and culture of Ashkenazic Jewry. Students will learn to read, write, and converse in Yiddish and will be introduced to a number of Yiddish songs. By the end of the semester, students should be able to converse in Yiddish on a variety of topics and to read selected Yiddish texts.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center

YID 12400 - Introductory Yiddish II

For students who wish to further explore the language and culture of Ashkenazic Jewry. A continuation of Yiddish 12300 using a communicative approach to develop conversational skills and provide students with further study of Yiddish grammar and vocabulary.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: YID 12300.

YID 22600 - Intermediate Yiddish

Offers students the opportunity to study the Yiddish language at the intermediate level. It reviews the grammar of the Yiddish language, enhances vocabulary, and includes literary and cultural readings. Designed to further develop listening, speaking, reading comprehension, and writing skills through class discussions and the use of multimedia and the Internet.

Credits: 3. Contact Hours: 4 hr./wk. plus 1 hr. at the Language Media Center Prerequisite: YID 12400 or placement.

Policies on Non-Discrimination and Sexual Harassment

The City College prohibits discrimination on the basis of race, color, creed, national origin, ethnicity, ancestry, religion, age, sex (including pregnancy, childbirth and related conditions), sexual orientation, gender, gender identity, marital status, partnership status, disability, genetic information, alienage, citizenship, military or veteran status, status as a victim of domestic violence/stalking/sex offenses, unemployment status, or any other legally prohibited basis in accordance with federal, state and city laws. The CUNY Sexual Misconduct Policy prohibits sexual harassment, gender-based harassment and sexual violence (together "sexual misconduct") against any CUNY student, employee or visitor.

It is also the University's policy to provide reasonable accommodations when appropriate to individuals with disabilities, individuals observing religious practices, employees who have pregnancy or childbirth-related medical conditions, or employees who are victims of domestic violence/stalking/sex offenses. Questions, concerns, or complaints based on any of the above may be directed to the Office of Diversity and Compliance, Shepard Hall, Room 109A-D (212-650-6310). Additionally, complaints under the Sexual Misconduct policy can also be filed with the Office of Public Safety or Office of Student Affairs.

Disclaimer

The City College of New York, 2017–2018 Undergraduate Bulletin represents the academic policies and procedures, services, course and program offerings that are in effect at the time of publishing. The Bulletin will not be updated to include any changes taking effect since publication. The most current information regarding academic programs and course descriptions, academic policies and services available to students can be found on the City College of New York web site. For matters of academic policy (e.g., applicable degree requirements), students are also advised to consult their major department adviser, refer to the departments web page, the Office of the Provost, and/or the Registrar for additional information.

Important Notice of Possible Changes

The City University of New York reserves the right, because of changing conditions, to make modifications of any nature in the academic programs and requirements of the University and its constituent colleges without advance notice. Tuition and fees set forth in this publication (or website) are similarly subject to change by the Board of Trustees of the City University of New York. The University regrets any inconvenience this may cause. The College does not guarantee to offer all courses it announces. The announcement is made in good faith, but circumstances beyond the control of the College may sometimes necessitate changes. The college may cancel courses if the enrollment does not warrant their being offered or if other contingencies make such a cancelation necessary.

About The City College

The City College of New York is a small university within The City University of New York, offering a rich program of undergraduate, master's and doctoral study through its various schools and divisions.

The College of Liberal Arts and Science comprises the:

- **Division of Humanities and the Arts**
- **Division of Science**
- **The Colin Powell School for Civic and Global Leadership (formerly the Division of Social Science)**
- **Division of Interdisciplinary Studies at the Center for Worker Education (CCNY Downtown)**

The Professional Schools are the:

- **Bernard and Anne Spitzer School of Architecture**
- **School of Education**
- **Grove School of Engineering**
- **The CUNY School of Medicine at the City College of New York**

Founded in 1847 by a referendum of the people of New York City, City College's mandate was to offer the best education possible to the "whole people" and to bring together students from various backgrounds to learn from the best faculty in the nation. The City College (CCNY) is the oldest college of the twenty-four units comprising The City University of New York (CUNY), which was established in 1961.

The College's resources include the Morris Raphael Cohen Library, the largest library in the University system, with holdings of over one and a half million volumes; more than two hundred teaching and research laboratories; The Towers, a six-hundred bed residence hall; and an Information Technology Center that provides instructional and research-oriented services and student access through numerous student computer labs. The Aaron Davis Hall is the site of rehearsals, performances, exhibits and technical training for students in the performing arts, as well as presentations by professional artists. It is a major cultural asset for CCNY as well as the New York City community. We are also home to two state of the art scientific research hubs, the Center for Discovery and Innovation and the Advanced Science Research Center, both located on our South Campus.

Accreditation

All degree programs are registered by the New York State Department of Education. The College is regionally accredited by the Middle States Commission on Higher Education (3624 Market Street, Philadelphia, PA, 19104-2680; 267-284-5000). Additionally, professional curricula are accredited by the appropriate professional educational agency or board including the National Architectural Accrediting Board, the Council for the Accreditation of Educator Preparation, and the Accreditation Board for Engineering and Technology.

Student Life

Over 15,000 undergraduate and graduate students commute regularly to the City College of New York campus, where over eighty languages other than English can be heard. This diverse student body is comprised of New York State residents, out-of-state students from across the United States, and international students representing more than one hundred different countries. Student diversity remains one of City College's hallmarks, with Asian, Black, and Hispanic students comprising 76 percent of those attending. For detailed demographic information about City College students, see the current edition of City Facts (www.ccnycuny.edu/institutionalresearch/index.cfm).

Within the Division of Student Affairs, student activities at CCNY fall under the umbrella of the Office of Student Life and Leadership Development, which provides support for more than one hundred fifty

student clubs and organizations. Included are the undergraduate and graduate student governments, two student newspapers, a yearbook, and a student-run radio station. Clubs reflect many of the academic, recreational, religious, political, professional and ethnic interests of CCNY's students.

The Campus

The City College campus occupies thirty-five acres along tree-lined Convent Avenue from 131st Street to 141st Street in the Borough of Manhattan. Many buildings in the area, known as St. Nicholas Heights, are landmarked, including CCNY's North Campus Quadrangle buildings and the former home of Alexander Hamilton, first Secretary of the Treasury. The larger campus for CCNY's students, of course, is the City of New York with a wealth of cultural and entertainment attractions found in few other cities of the world.

The City College is easily accessible by subway and bus; express trains from mid-Manhattan reach the campus in about fifteen minutes.

Nearly \$166 million of new construction and renovation is underway on the campus, including two advanced Science research centers on South campus (which should be completed in 2014 and cost approximately \$800 million).

All students, faculty and staff are issued an identification card that must be worn at all times in College buildings.

Original Campus Buildings

Built in 1904, the original college buildings were designed by the architect George Post in a Collegiate Gothic style. Four halls—Shepard, Baskerville, Townsend Harris and Wingate—were grouped around a green quadrangle and, with Compton and Goethals Halls (added later), now constitute the "North Campus." These buildings and the college gates are listed in the State and National Register of Historic Places.

Steinman Hall-Engineering (ST)

Just outside the north campus gate is the modern Steinman Hall-Engineering Building. Steinman, a six-story building equipped with approximately ninety eight research and teaching laboratories, also houses the CUNY Energy Institute. More information about specific facilities in Steinman Hall can be found in the sections of this Bulletin describing the engineering programs.

North Academic Center (NA)

Dedicated in 1984, the North Academic Center covers three full city blocks and has around 1,200 classrooms, labs, lecture halls and a media center. This building also contains the Cohen Library, the Finley Student Center, student government offices, meeting rooms, a print shop, a small theater, a ballroom and the campus dining areas. It is the largest academic building on the campus and contains the School of Education, the Division of Humanities and the Arts, The Colin L. Powell School for Civic and Global Leadership (formerly Social Science) and the newly expanded Information Technology Center as well as many computer laboratories.

The Robert E. Marshak Science Building (MR)

The Marshak Science Building, a modern and fully equipped thirteen-story building, houses the science programs. The facilities include a number of computer laboratories, a networked system of SUN and SGI computers, laser labs, electron microscopes, nuclear magnetic and electron spin resonance systems, a mass spectrometer facility, an NMR facility, biomedical research laboratories, the Science and Engineering Library, a planetarium, a weather station, and 184 teaching and research laboratories. Also found in the Marshak Building are the Nat Holman Gymnasium and the Jeremiah Mahoney Pool. The Holman Gym seats approximately 1,800 spectators and is a large, modern, multi-purpose

facility, home to many of the College's varsity athletic teams. The Mahoney Pool is used for competitions and recreational programs.

City College Center for Discovery and Innovation

The City College Center for Discovery and Innovation opened in Fall 2014 and features approximately 200,000 square feet of space for advanced research in key interdisciplinary fields. The facility is a magnet for regional, national and international researchers and an academic hub of learning for students and faculty. The new research center and pedestrian plaza serve as a gateway to the south campus of City College, which also features the CUNY Advanced Science Research Center.

The Center for Discovery and Innovation is a futuristic architectural vision that reflects the research inside its laboratories. The interiors have been designed for optimal research functionality and to facilitate collaboration between all who work there.

Expanding upon the college's vision of strengthening academics through interdisciplinary study and research, five major innovative fields are featured in the facility: Nanotechnology, Photonics, Structural Biology, Neuroscience and Environmental Sciences. The scientific and technological achievements at the City College Center for Discovery and Innovation improve environments, extend lives, and transform societies in New York City and around the world.

Designed by the architectural firm of Kohn, Pedersen and Fox, the City College Center for Discovery and Innovation builds upon our already stellar reputation as a major research campus and nexus for leading scientists.

CUNY Advanced Science Research Center

The Advanced Science Research Center has brought CUNY to a landmark moment in its multi-billion-dollar commitment to becoming a national leader in visionary scientific research of vital, real-world consequence.

Located on the south end of the City College campus in Upper Manhattan, the striking, 200,000-square-foot ASRC building embodies a bold vision of 21st Century discovery. At the center's core is a world-class facility designed to inspire an innovative approach to the scientific method itself, one that links a new wave of talented scientists with hundreds of top researchers from CUNY campuses across the city.

The ASRC focuses CUNY initiatives in five of the most energized areas of global research: Nanoscience. Photonics. Structural Biology. Neuroscience. Environmental Sciences.

These are diverse and seemingly distinct fields, but they intersect in many of the most significant research quests of our time. It was the opportunity for myriad collaborations—particularly between labs in areas that are already in CUNY's spheres of strength—that guided the center's planners. Led by Vice Chancellor for Research Gillian Small, what they have conceived is the DNA of a distinctive research culture—creative, collaborative, convergent—to take on scientific challenges ranging from Alzheimer's disease to the future of the global water supply.

City College Center for the Arts

Hosts an ambitious, year-round calendar of student and professional performances. The mission of the City College Center for the Arts is to provide a creative arts center and focal point for the City College of New York, building a sense of community within the College, elevating the profile of Aaron Davis Hall in the greater New York area, and connecting the College to the surrounding community through the arts.

Aaron Davis Hall (AD)

Home to CCCA, features a two-theatre performing arts complex with an extensive history in Harlem and throughout this city. Aaron Davis Hall has hosted many of the world's greatest performers, brilliant minds and creators like Nelson Mandela, Harry Belafonte, Bill T. Jones, Celia Cruz, Wylla Tharp, and so many more. Aaron Davis Hall is the only cultural facility of its kind north of Lincoln Center used by groups like Dance

Theatre of Harlem, Alvin Ailey II, Harlem School of the Arts, Carnegie Hall and Ballet Hispanico

The Architecture Building (AR)

The Bernard and Anne Spitzer School of Architecture is housed in a 124,000 square foot facility, designed by architect Rafael Viñoly, which is designed to accommodate approximately 400 students. The building contains studios, classrooms, an exhibit area, administrative offices, the library, and computer labs. The studios each provide close to 1,000 square feet of space. The building also houses the City College Architecture Center (CCAC), which provides consulting services to community-based organizations.

The Towers Residence Hall (TD)

The Towers at CCNY is the first residence hall to be built on the CCNY campus in its 167-year history. The Towers, located on the corner of West 130th Street and St. Nicholas Terrace on the South Campus, opened its doors in August 2006. Currently, The Towers provides accommodation for 600 resident students.

The Towers consists of 164 fully-furnished, air-conditioned suites in four configurations housing one to four students each as well as a limited number of studio and one-bedroom suites available for faculty housing. All suites have a fully-functional kitchenette. The Towers offers wireless internet service throughout the entire building (including resident rooms and lounges), a multi-purpose seminar room, a fitness center, a central laundry facility, a convenience store and a community kitchen. All residents are required to have an access card for entry at the 24-hour security desk; there are closed-circuit security cameras located throughout the building. CCNY operates a shuttle/escort van service to provide residents with easy access to the North Campus and local subway stations. The Residence Life Staff, which consists of Resident Assistants and professional staff, provides supervision of the building in accordance with CUNY/CCNY policies and procedures. Residence Life also strives to create community through educational and social programming and serves as a resource to all residents.

Information regarding the application process, scheduling a tour, and costs can be found on The Towers website at www.ccnytowers.com. The cost for living in The Towers varies by suite type and length of contract, however, all utilities (i.e., electric, heat, A/C, local phone service, access to internet service, access to free laundry room, and basic cable TV service) are included. Prospective residents may contact The Towers office by phone at (917) 507-0070 or via email at towers@ccny.cuny.edu

Zahn Innovation Center

The Zahn Innovation Center is an incubator that nurtures entrepreneurial initiatives at the City College of New York, providing students, faculty and staff with the tools they need to transform their ideas into sustainable ventures. We offer support for both technology-enabled start-ups and social impact ventures.

The Center provides co-working spaces for its technology start-ups and social ventures and an ongoing, campus-wide speaker series. We host four entrepreneurship competitions per year, with \$140,000 in prize money on the table. We also offer mentorship, practical workshops, and expert pro-bono services for legal, Intellectual Property, incorporation, and accounting support. For technology and hardware based start-ups we also offer a wide range of prototyping capabilities including 3D printing, laser cutting, and machining, as well as access to an experienced design engineer.

AN INCUBATOR

We are a startup incubator located at the City College of New York offering co-working space and an array of resources including: annual competitions, a startup bootcamp, mentorship and pro-bono services, networking opportunities, and rapid prototyping facilities.

AN APPLIED EDUCATION

We inspire CCNY students to approach their education as changemakers, transforming classroom learning into real-world application. Each semester we partner with various academic departments to create curricula to cultivate the entrepreneurial mindset. We also pair students with startups and other companies in the NYC area through our robust internship program.

A COMMUNITY OF CHANGEMAKERS

We invite all entrepreneurial thinkers to join our diverse community by attending our public events. We host prominent entrepreneurs, investors and other innovators to City College's campus, we host hackathons, work-shops and other programs throughout the year. We also encourage students to join one of our startup teams or become a part of the Center through the Entrepreneurship Student Club.

Research and Study Facilities

The City College library system includes:

- the Morris Raphael Cohen Library (North Academic Center)
- the Music Library (Shepard 160)
- The Architecture Library (Spitzer School of Architecture 101)
- the Science/Engineering Library (Marshak 29)
- the Center for Worker Education Library (25 Broadway)

Cohen Library, built around an atrium in the North Academic Center, occupies five floors and houses Humanities, Powell School and Education materials. The collections, the largest in the CUNY system, total more than 1,600,000 volumes, 961,000 microforms, 32,000 media, and 1.1 million digital titles. Designated a Federal depository in 1884, the library has 100,000 government documents. The Archives and Special Collections Division contains 4,500 linear feet of official records and historical material on the College in addition to rare books and special subject collections. Digital library holdings include more than 983,000 e-books, and 122,000 electronic subscriptions. The library serves the instructional and research needs of undergraduate through doctoral levels and provides study areas, carrels and computer workstations for students and faculty.

The website: <http://library.ccny.cuny.edu>, provides quick and easy access to digital resources – full text, indexes, dissertations and catalogs – from more than 300 databases, including Science Direct, LEXIS-NEXIS, Web of Science, El Village, JSTOR, MathSciNet, PsycArticles. Project Muse, IEEE Xplore, the American Chemical Society, and the Avery Index to Architecture Periodicals. The CUNY+ library catalog on the web provides access to library holdings both at City College and throughout CUNY. The CCNY Alphabetical List of Journal Titles Online provides access to 122,000 digital periodicals.

Books and periodicals are arranged on open stacks. The Library of Congress classification is used for the shelf arrangement of most books. Over four hundred computers provide access to digital resources, document preparation software and the internet. CLICS, the intra-CUNY borrowing system, allows users to request materials from any library in the University, for delivery to any CUNY library of their choice. Document delivery, Interlibrary loan and METRO referrals enable faculty and students to obtain materials from other library collections in the metropolitan area and beyond.

The libraries host a full calendar of exhibitions, readings, lectures and programs in multiple venues.

Library faculty provide individualized library service to faculty and students, information literacy education, instruction in research methodology and resource evaluation on multiple levels, from FIQWS through graduate courses.

Office of Information Technology

Over the past few years the Office of Information Technology (OIT), overseen by the Assistant Vice President and Chief Information Officer, has undergone a dramatic expansion. Major changes have included deploying a new backbone network that can support greater bandwidth and traffic speeds. OIT has also introduced a student laptop loaner program and has begun construction on two new technology-rich active learning centers.

The mission of the Office of Information Technology is to:

- Empower the user community to achieve the highest level of academic and administrative success through the effective use of information technologies
- Facilitate academic innovations in teaching, learning, research and scholarship
- Deliver excellent technology services in support of City College's mission.

The OIT is committed to collaborating with the college community to provide excellent information technology products and services. We recognize that the College community has the best chance to succeed when we within the OIT strive for excellence and uphold the highest standards in our daily operations.

The OIT is responsible for software applications, hardware support, telecommunications, media services, network infrastructure, instructional technologies and information security. In addition to providing technical support services to the College community we also initiate technology enhancement projects and implement innovative solutions to technology-based issues to improve campus life.

As College populations become more and more technology savvy, the professional skills development of the OIT staff has become extremely important. Technology is constantly evolving, and it seems that every day there is yet another new application released that is meant to simplify business dealings. We are committed to staying current with the high-level trends of technology and their corresponding impact on education with constant training courses for our staff.

The OIT houses two general computer labs to facilitate the technology needs of our students. (1) The North Academic Center (NAC) General Student Lab, which provides 108 Windows-based computers; and (2) The City Tech Center, City College's new state-of-the-art computing, learning and training resource center, located on the ground floor of the Cohen Library in the North Academic Building, room NA 1/301. Re-designed to accommodate student learning in a variety of stimulating configurations. The Tech Center provides the following services:

- Over 300 workstations
- Seven printers (five general-use, one color, and one wifi enabled)
- Ten media study rooms (MSR) with dual-flat panel displays that accommodate from three to six students
- Fifteen two-person study rooms equipped with Windows or Macintosh desktop workstations
- Three smart classrooms containing 32, 35 and 50 workstations, high definition projectors, and, in the largest classroom, a podium with AV controls and laptop connections.
- Over 80 single-use desktop in the open bays
- Laptop loan program for students to use while on campus.

The workstations are configured with compatible version of the college's site-licensed software, including Adobe Creative Suite, Matlab, Microsoft Office Suite, SAS, and SPSS. The spatial configurations accommodate students who choose to work individually, as well as provide incentives for student collaboration.

The Service Desk provides support for the CUNY Portal, Blackboard LMS, laptops, CUNYfirst wireless configuration and access, and acts as a central distribution point for campus-wide, site-licensed software to the college community. The Service Desk also provides Tier 1 technical support for students, faculty and staff in the following areas:

- Technical information technology support
- Mobile devices
- Laptop
- Wireless configuration and access
- Site-licensed software
- College e-mail system (Citymail)
- Registration
- CUNY Portal
- Password Reset
- Blackboard
- Active Directory log-in

This one-stop shop solution has given the OIT staff a more efficient way of addressing the technology needs of students, faculty and staff.

Call us at 212.650.7878, email us at servicedesk@ccny.cuny.edu or come find us on the ground floor of the Cohen Library in the North Academic Building, room NAC 1/301.

For more information on our services and opening hours visit our website: <https://www.ccny.cuny.edu/it/help>

Our iMedia department provides audio-visual (AV) resources and services in support of academic instruction, scholarly communications, and other activities consistent with the College's mission.

iMedia provides the following services:

- iMedia and classroom technology support
- Audio-visual resources for loan
- Video conferencing services
- Video duplication and conversion services

iMedia also provides in-classroom AV technology support for users in smart room locations, video-conferencing services utilizing IP based BlueJeans or Polycom equipment, DVD duplication services, VHS to DVD conversion services and a host of AV resources including microphones, document cameras, AV cables, audio and video recorder and playback devices and Mac and PC laptops for loan on a per class or per semester basis.

The College has 140 Smart Classrooms that are outfitted with an LCD projector, projection screen, audio speakers and an audio and video input interface for use with laptops, iPods, document cameras and other AV devices. Our iMedia and Client Services technicians maintain and service this equipment.

Call us at 212.650.5480 or come find us in NAC 5/220.

At City College you will be joining a community devoted to creating and sharing information. Whatever happens you will be a learner, a discoverer, and a technology consumer at City College. You will be using computers and other information technologies for your coursework. We in the OIT are committed to helping you to achieve your full potential and are ready and available to answer any questions at any time.

Academic Offerings

The College offers the following degrees:

- Bachelor of Arts
- Bachelor of Science
- Bachelor of Engineering
- Bachelor of Science in Education
- Bachelor of Fine Arts
- Bachelor of Architecture
- Various master's and combined B.A./M.A., B.A./M.S. degrees

In August 2008, The City College was granted the authority by the State of New York to offer Ph.D. degrees in Engineering as well as joint degrees in Science with the CUNY Graduate Center. A number of other doctoral programs are based at City College with the Ph.D. degree

awarded through the Graduate School and University Center of The City University of New York.

The Sophie Davis School of Biomedical Education offers a program that enables students to earn a B.S./M.D. degree in seven years.

The Right to Privacy

The College complies fully with the Family Educational Rights and Privacy Act (FERPA), as described in Appendix B.10 of this publication.

Retention, Graduation and Job Placement

Retention

City College remains faithful to its mission of "Access to Excellence," beginning with its recruitment of students through to its engagement with alumni. In addition to its unique freshman seminar (Freshman InQuiry Writing Seminar/FIQWS) and curricula, CCNY offers intentional advising and academic supports, such as the Writing Center, subject-specific tutoring, and four-year graduation plans.

Of the first-time regularly admitted freshmen in the Fall 2009 Cohort, 83.3 percent were retained after one year, 67 percent after two years, 60.2 percent after three years, and 45 percent after four years. The six-year graduation rate for this cohort is 44.2 percent.

Job Placement

City College's Career and Professional Development Institute assists the students and alumni by providing a full range of high quality programs and services, such as counseling; self-assessment software; workshops, seminars, and job fairs; and internship information and preparation.

Of the over 1,800 graduates who earned degrees in 2014-2015, approximately 52 percent reported full-time employment or enrollment in graduate programs.

Important Note

The City University of New York reserves the right, because of changing conditions, to make modifications of any nature in the academic programs and requirements of the University and its constituent colleges without advance notice. Tuition and fees set forth in this publication are similarly subject to change by the Board of Trustees of The City University of New York. The University regrets any inconvenience this may cause.

The College does not guarantee to offer all courses it announces. The announcement is made in good faith, but circumstances beyond the control of the College sometimes necessitate changes. The College may cancel courses if the enrollment does not warrant their being offered or if other contingencies make such a cancellation necessary.

Admissions

The Office of Admissions is located in the Wille Administration Building, A-101, 160 Convent Avenue (at 138th Street), New York, NY 10031.

Procedures for admission to City College as a freshman or as a transfer student from another college with advanced standing often differ from one program to another; students are therefore encouraged to visit or call the Office of Admissions at 212-650-6977 with any questions. Admissions information can also be obtained at www.cuny.edu/admissions.

Campus Visits

Tours of the campus are scheduled by appointment. Please call 212-650-6476. The Office of Admissions hosts an annual Open House in the fall. Students may also request visits to particular departments or programs.

Degree and Non-Degree Admission

Students are classified into two groups. Degree students are those who have been accepted into a specific college program leading to a degree. Non-degree students may enroll in credit courses but are not officially registered in a degree program. Non-degree students must be skill proficient in English and Mathematics and meet all prerequisites for the courses in which they wish to enroll. A limited number of credits earned by such students may later be transferred to a degree program.

Freshman Admission

Freshman admission is based on a student's overall high school academic average, grades in individual subjects, distribution of academic courses, and standardized test scores (all recent high school graduates are required to submit SAT or ACT scores). The College recommends four years of English, four years of social studies, four years of mathematics, three years of laboratory science, three or four years of a foreign language, and one year of performing or visual arts as the academic preparation needed for success at City College. ***In New York State, students must take the Test Assessing Secondary Completion (TASC). However, CUNY will also consider the following credentials for admission purposes: High School Equivalency Test (HiSET), the "new" GED Tests, the "old" GED and the International GED.*** International applicants from non-English speaking countries are required to submit a TOEFL (Test of English as a Foreign Language); the International English Language Testing System (IELTS) score; or Pearson (PTE).

CUNY Skills Requirements

All freshmen and transfer students are required to meet City University's skills proficiency requirements in reading, writing and mathematics by taking and passing the CUNY Assessment Tests. Exemptions from these exams may be granted based on standardized test scores or courses taken at other colleges. Contact the Office of Admissions for detailed information.

Applying for Freshman Admission

Applicants for freshman admission can apply online at www.cuny.edu/admissions. Priority is given to applications completed before February 1 (for fall admission) and September 15 (for spring admission). The application deadline for students applying to the Macaulay Honors College is December 1.

Selective programs such as Macaulay Honors College, Sophie Davis School of Biomedical Education, Grove School of Engineering, and Bernard and Anne Spitzer School of Architecture have earlier deadlines

and/or special application requirements; please contact the Office of Admissions for more information.

CONTACT OUR HELP DESK

For admission-related questions, including those regarding the status of your admission application, contact the appropriate Help Desk.

Help Desk for Students
admissions@cuny.edu
212-997-CUNY(2869)

Macaulay Honors Help Desk: macaulayhelpdesk@cuny.edu

Help Desk for Veterans: vetwaiver@cuny.edu

SEEK Counseling and Student Support Services/The Percy Ellis Sutton SEEK Program

The Percy Ellis Sutton Search for Education, Elevation and Knowledge (SEEK) program is a program for New York State residents who are in need of both academic and financial assistance in order to obtain a college education. SEEK students may be eligible to receive up to five years of state-funded tuition assistance and a stipend to help cover the cost of books and college fees. They also receive intensive counseling and academic support.

A student wishing to apply to the SEEK program should file the CUNY freshman application and complete the section labeled SEEK and College Discovery. For more information about SEEK, refer to the section in this Bulletin describing the Department of SEEK Counseling and Student Support Services.

Macaulay Honors College/CCNY Honors Programs

Entering freshmen may apply to several honors-level programs at the College, including the City College Honors Program, Macaulay Honors College and the Grove School of Engineering Honors Program.

These programs are academically rigorous. For application and deadline information, contact the Office of Admissions (212-650-6977).

Advanced Placement

Students who enrolled in an advanced placement program while in high school may be excused from certain courses or may receive credit based on advanced placement examination results. The College will award up to thirty-two credits for advanced placement courses. Generally, for scores of 4 or 5, the College will award course credit. Students who have taken the advanced placement examinations should have the scores sent to the Office of Admissions.

College Courses Taken in High School

High school students who have taken college level courses must provide the college/university transcript to the Office of Admissions in order to have the courses evaluated for credit.

Transfer Admission

Transfer admission is based on a student's overall grade point average (G. P. A.), including courses taken at all institutions attended since graduating high school. Admission criteria is subject to change. The

application deadline for the fall semester is February 1 and for the spring semester September 15. Admission criteria vary by school as follows:

College of Liberal Arts and Science and School of Education

1. CUNY Community College graduates.
2. All others must meet one of the following criteria:
 - a. less than 24 credits earned at a 2.50 G.P.A. and meet current requirements used for freshman admission; or
 - b. 24 or more credits earned at a 2.5 G.P.A.; or
 - c. 0 credits earned and meet current requirements for freshman admission.

Applicants who have a grade point average below 2.0 but have not attended college for at least five years may be admissible to the College of Liberal Arts and Science.

Spitzer School of Architecture

Transfer admission to the Bernard and Anne Spitzer School of Architecture is highly selective and is based on a student's overall grade point average (G. P. A.) and a supplemental creative challenge available from the City College Office of Admissions website (ccny.cuny.edu). The Spitzer School of Architecture admits a limited number of transfers students.

Grove School of Engineering

Transfer applicants to the Grove School of Engineering are required to present a G. P. A. of at least 2.7 and two semesters of calculus (equivalent to MATH 201 and MATH 202 at City College) with a grade of "C" or higher and one semester of physics (equivalent to Physics PHYS 207 at City College) with a grade of "C" or better and completed a minimum of 24 college credits. The applicants must demonstrate proficiency in math and science.

International Students

United States citizens and those applicants on temporary visas whose schooling has been outside the United States should file the appropriate transfer or freshman application. In addition, students who are on temporary visas and whose native language is not English will be required to submit results of the Test of English as a Foreign Language (TOEFL); the International English Language Testing System (IELTS); or Pearson (PTE). Applications are available on-line at www.ccny.cuny.edu/admissions. International freshman applicants should also submit SAT or ACT results. See the CUNY admissions website for more information about submitting scores.

International students are encouraged to apply at least eight months prior to the semester the applicant wishes to enter. Each student's application is individually evaluated. In addition, new regulations imposed by the United States Department of Homeland Security may cause delays in receiving the F-1 student visa. It is possible that it may take longer than eight months to be admitted and enrolled at City College. In most cases, international students are not eligible for financial aid.

Readmission to City College

Students who have not attended City College for one or more semesters (exclusive of Summer Semester) must file an application for readmission with the Admissions Office at least three (3) months prior to the beginning of the semester for which readmission is sought. Applications for readmission are available on the college's web site at www.ccny.cuny.edu/admissions or at the Admissions Office. Approval

from the appropriate Dean's office must be obtained prior to submitting an application.

Readmission is not guaranteed to any applicant. Decisions are based on the student's academic record at City College. Applicants should provide a statement indicating the reason(s) for absence from the College and any relevant supporting documentation. The College seeks to readmit only those students who can demonstrate the ability to remain in good academic standing and complete degree requirements within a reasonable period of time. If the applicant's grade point average is below 2.0, approval must come from the Committee on Course and Standing of the specific school the student plans to enter.

Clearance by the Bursar's Office is necessary before action can be taken on an application for readmission. There is a non-refundable fee of \$20 which will not be charged at the time of application, but will appear on the student's first semester registration bill.

Special Categories for Admission

Early Admissions (High School Juniors)

City College admits academically exceptional high school students upon the completion of their junior year of high school. Students enter as degree students into the College's Honors program. Applicants generally are from the upper 10% of their high school class. Students are accepted on the basis of demonstrated academic achievement and an interview by a member of the Admissions Committee. For applications, contact the Admissions Office.

Second Degree

City College accepts applications for a second undergraduate degree when the second degree represents preparation discrete from the preparation identified in the first bachelor's degree. Applicants must receive approval from the dean or representative from the school or division from which the second degree is being sought. Applicants should apply as transfer students at www.ccny.cuny.edu/admissions.

Post-Baccalaureate Status

Students who already hold a bachelor's degree and wish to enroll in undergraduate courses for personal or professional enrichment, without pursuing a degree, may be eligible for post-baccalaureate admission. Students must meet course prerequisites as determined by the department and are admitted on a space available basis.

Non-Degree Status

Students who do not hold a bachelor's degree must be high school graduates or hold a General Educational Development (GED) diploma with a minimum score of 3250, and should submit transcripts of any prior college training. Courses taken by non-degree students are primarily intended for personal enrichment. All non-degree students (post-baccalaureate, visiting, non-degree) are limited to a maximum of 24 credits, except in the School of Engineering, which limits students to 12 credits. Departmental approval is needed to register for courses in English, mathematics, science and English as a Second Language. Non-degree students are not allowed to register for courses in the Grove School of Engineering or the Spitzer School of Architecture. Non-degree students must be proficient in English and Mathematics.

Non-degree and post-baccalaureate students are not eligible for financial aid and must pay tuition and fees. This special enrollment procedure does not apply to graduate courses.

Non-degree students must meet all prerequisites for the courses in which they wish to enroll. City College degree students have first priority for registration. Non-degree students register for classes on a space available basis.

Senior Citizens

New York State residents who are 60 or older may enroll tuition-free in undergraduate courses on a space-available basis, provided they do so

on an audit basis. An \$80 per semester fee is required of senior citizens who are auditing courses. Those who wish to enroll for credit may do so on the same basis as other degree-credit students. Senior citizens who wish to take courses for credit must file a regular application and meet the general admission requirements. For information regarding course offerings or application procedures, contact the Office of Admissions.

Visitors from Other CUNY Colleges or Universities

From Within The City University of New York

Students currently enrolled at another CUNY college must file an E-Permit with their home college. Check the website of the home college for E-Permit application and procedures.

From Outside The City University of New York

Students who are currently enrolled in schools outside CUNY must provide the Office of Admissions with a copy their transcript from their home school, together with a completed non-degree application. There is a non-refundable application fee of \$65. An on-line applications is available at www.cuny.edu/admissions.

Visitors from other colleges may not take courses in the Grove School of Engineering and the Spitzer School of Architecture. The Department of Mathematics may request that students take an examination to verify placement into specific courses.

Note: Non-degree students attending City College are not eligible to take courses on permit at another CUNY college.

Integrity of Documents

All documents submitted to City University and City College in support of an application for admission become the possession of City University and City College and will not be returned to the applicant.

For information about the CUNY policy on Admissions Application Fraud see the CUNY Manual of General Policy ARTICLE VII STUDENT AFFAIRS AND SPECIAL PROGRAMS > Policy 7.01 Admission Application Fraud (http://policy.cuny.edu/manual_of_general_policy/article_vii/policy_7.01/text)

All information requested on an application must be answered fully and correctly. Omission of colleges, universities and/or proprietary schools attended or falsification of information will constitute grounds for permanently rescinding an offer of admission, disciplinary action and/or dismissal.

Health Statement and Immunization Requirement

New York State Public Health Law 2165 requires proof of immunity to measles, mumps and rubella (MMR) as a condition for attendance. The College reserves the right to prevent the registration of any applicant who fails to provide a record of immunization or who otherwise provides a health risk to the College community. It is University policy that all students who register for six or more credits/equivalent credits and were born after December 31, 1956 must provide proof of their immunity to measles, mumps and rubella. Students may fax their immunization records and the forms to 212-650-8227.

New York State passed Public Health Law (PHL) 2167, addressing meningococcal meningitis. In compliance with PHL 2167, all New York State students, regardless of how many credits they take in college, must fill out a Meningococcal Meningitis Response form within 30 days of registration or at the same time they send in their MMR compliance document.

Students may download forms at http://origin.admin.cuny.cuny.edu/student_affairs/wellness/default.asp. If submitting the forms by fax, be sure to include the name, social security number (or assigned City College identification number) and birth date. Applicants are advised to confirm the receipt of the fax by calling 212-650-8222.

CUNY Policy on Admission of Students Who May Pose a Risk to the College

The college reserves the right to deny admission to any student if in its judgment, the presence of that student on campus poses an undue risk to the safety or security of the college or the college community. That judgment will be based on an individualized determination taking into account any information the college has about the crime committed by the student and the particular circumstances of the college, including the presence of a child care center, summer camp, public school or public school students on the campus. In addition, the college may consider factors such as the amount of time since the crime was committed, the amount of jail time served by the student, the number of years the student was on probation or parole, whether the student has satisfied probation or parole requirements at the time of the student's application, whether the student has completed drug, alcohol, sex offender or other treatment, and what work or educational experience the student has had after the conviction. Finally, if the student is known to have been assisted by CUNY-sponsored or other re-entry program or initiative, the college will consult with a counselor or representative from said program.

Tuition and Fees

The Bursar's Office is located in the Wille Administration Building, Room 103, and the telephone number is 212-650-8700.

Tuition is set by the University Board of Trustees and is subject to change without notice of their actions. Students should arrange to pay their total tuition, fees and charges as the final step of the registration process if they wish to be admitted to classes. Students who may be eligible for financial assistance or grants should consult with the Financial Aid Office as early as possible.

Undergraduate Tuition Per Semester

	Resident Students	Non-Resident Students
Full-Time	\$3265 per Semester	\$580 per Credit
Part-Time	\$285 per Credit	\$580 per Credit
Non-degree Students	\$415 per Credit	\$865 per Credit
*Mandatory Fees	\$204.95 full-time \$118.95 part-time	\$204.95 full-time \$118.95 part-time

Semester Fees

	Resident	Non-Resident
Consolidated Fee	\$15	\$15
Technology Fee	\$125 (Full Time) \$62.50 (Part-Time)	\$125 (Full-Time) \$62.50 (Part-Time)
Student Activity Fee	\$63.50 (Full-Time) \$40.00 (Part-Time)	\$63.50 (Full-Time) \$40.00 (Part-Time)
Student Senate Fee	\$1.45	\$1.45

Application Fees

Undergraduate Freshmen	\$65
Undergraduate Transfer	\$70
Graduate	\$125
Readmission	\$20
Late Registration	\$25
Change of Program	\$18
Duplicate Receipt	\$5
Returned Check Fee	\$20
Late Payment Fee	\$15
Transcript	\$7
Make-up Examination, first in semester	\$25

Undergraduate Freshmen	\$65
Make-up Examination, second in semester	\$5
Duplicate ID Card	\$10
Senior Citizens	\$80 (\$65 + \$15 consolidated fee)

** Subject to change through a student referendum & Board approval

There may be other costs and fees associated with academic work, such as textbooks and studio or lab materials. Notice of additional fees will appear in the course listing in each semester's Schedule of Classes.

Senior Citizen Fees

Individuals who have reached the age of 60 prior to the first day of a semester may enroll for undergraduate courses on an audit basis and pay only the Senior Citizen's fee of \$65.00 plus the \$15.00 consolidated fee. Persons in this category may enroll on a space available basis after degree students have had an opportunity to register. Students must document their eligibility by submitting a copy of one of the following:

- Medicaid card
- Driver's License or Non-Driver ID
- Birth Certificate

Tuition Refunds

When courses are cancelled by the College, a full refund of appropriate tuition and fees will be made. In other cases, tuition refunds will be made or liability reduced only in accordance with Board of Trustees regulations. Further information can be obtained from the Office of the Registrar. On approved applications, proportionate refunds of tuition will be made in accordance with the schedule below. The date on which the application is filed, not the last date of attendance, is considered the official date of the student's withdrawal and serves as the basis for computing any refund.

Withdrawal before the first day of classes (as published in the Academic Calendar)	100%
Withdrawal before completion of the first full scheduled week of classes	75%
Withdrawal before completion of the second full scheduled week of classes	50%
Withdrawal before completion of third full scheduled week of classes	25%
Withdrawal beyond third week	0%

Consolidated, student activity, materials and technology fees are not refundable.

Payment of Collection Costs

Students who do not make full payment of their tuition, fees and other college bills and whose account is sent to a collection agency will be responsible for all collection costs, including agency fees, attorney fees, and court costs, in addition to whatever amounts are owed to the College. In addition, non-payment or a default judgment against a student's account may be reported to a credit bureau and be reflected in their credit reports.

New York State Residency Requirements

Students are assigned residency status when admitted to the College. Since residency determines tuition rates, students should know their classifications. If there is a question of status it is the responsibility of the student to prove residency. A "CUNY Residency Form" is available at the Office of the Registrar. New students must apply through the Office of Admissions.

The Financial Aid Office administers federal and state funds, as well as those provided by special programs and the College itself. Federal funds may be disbursed only to those who maintain their academic standing and are not in default of a student loan or owe a refund on a federal grant. For the most recent information on application filing procedures, deadline dates, and eligibility criteria for the various programs, students are urged to contact the Financial Aid Office.

For additional information, see the CUNY Website describing New York State residency (<http://www2.cuny.edu/about/administration/offices/legal-affairs/university-tuition-fee-manual/iv-residency>).

Financial Aid

The Financial Aid Office is located in the Wille Administration Building, Room 104 and the phone number is (212) 650-6656.

The Financial Aid Office administers federal and state funds, as well as those provided by special programs and the College itself, with the intention of insuring that all qualified students will have an opportunity to pursue higher education. Scholarships, grants, loans, work opportunities and governmental benefits are combined into a package to help meet the difference between the cost of attendance and the contribution from the student and family. Unless otherwise stated, award amounts are based upon need. Federal funds may be disbursed only to those who maintain good academic standing and are not in default of a student loan or owe a refund on a federal grant. Students are urged to apply before the priority deadline of March 15. For the most recent information on application filing procedures, academic progress requirements, and other eligibility criteria for the various programs, students are urged to contact the Financial Aid Office.

New York State Awards

Tuition Assistance Program (TAP)

TAP is a grant for full-time undergraduate students who are residents of New York State and who are U.S. citizens or eligible noncitizens. Undergraduates may be eligible for grants from \$500 to a maximum of \$5,165 for the academic year. TAP awards cannot exceed the cost of tuition. Participants in this program are expected to comply with the program pursuit and academic progress requirements to remain eligible for subsequent TAP awards. One of the New York State Higher Education Services Corporation (NYSHESC) academic eligibility requirements is that students must declare a major when they have accumulated 60 or more credits. Declaration or change of major, concentration or minor must be submitted by the deadline published in our academic calendar. In addition, students must be registered for at least 12 credits contributory toward their major, minor or general education requirement. Further information on TAP eligibility is available in the Financial Aid Office and on its website.

Aid for Part-Time Study (APTS)

This grant program is financed by New York State and administered by participating colleges. APTS provides aid to part-time (6-11 credits) undergraduates for their educational expenses. Awards cannot exceed tuition costs. Recipients must file a FAFSA and a TAP application and be New York State residents who have not used up eligibility for the TAP program. In addition, students must complete and submit the "CUNY Supplement Form. In addition, students must complete and submit the "CUNY Supplement Form" in the CUNYfirst Student Center To-do-list.

NYS Science, Technology, Engineering and Mathematics (STEM) Incentive Program

The NYS STEM Incentive Program provides a full CUNY tuition scholarship for the top 10 percent of students in each New York State high school if they pursue a STEM degree in an associates or bachelor degree program and agree to work in a STEM field in New York State for 5 years after graduation.

Eligibility

An applicant must:

- Be a NYS resident
- Be a U.S. citizen or eligible non-citizen
- Be enrolled full time at a SUNY or CUNY college, including the statutory or contract colleges at Cornell University and Alfred

University, beginning with the fall term following his or her high school graduation

- Be ranked in the top 10% of his/her high school graduating class of a NYS high school
- Be matriculated in an undergraduate program leading to a degree in Science, Technology, Engineering or Mathematics at a SUNY or CUNY college
- Earn a cumulative grade point average (GPA) of 2.5 or higher each term after the first semester
- Execute a service contract agreeing to reside and work in NYS for five years in the field of Science, Technology, Engineering or Mathematics.
- Not be in default on a student loan made under any NYS or federal education loan program or repayment of any state award
- Be in compliance with the terms of any service condition imposed by a state award

Award Amounts

Recipients shall receive an annual award for full-time study equal to the annual tuition charged to NYS resident students attending an undergraduate program at the State University of New York, or actual tuition charged, whichever is less. The STEM award will be reduced by the amount of any other tuition-only assistance award received.

Duration

Recipients shall be entitled to an annual award for not more than four academic years of full-time undergraduate study while matriculated in an approved program leading to a degree in Science, Technology, Engineering or Mathematics or five years if the program of study requires five years.

How to Apply

Applications will be available October 1 every year for the upcoming academic year. Recipients are not required to submit another New York State Science, Technology, Engineering and Mathematics Incentive Program Web Supplement once they have been awarded this scholarship, but must complete the (FAFSA) and TAP application each year. Awards will be paid directly to the school on behalf of students upon the successful completion of each term. Successful completion of a term means the applicant meets all of the eligibility requirements for the award.

Federal Awards (Title IV Aid)

Pell Grant

Pell is an entitlement program, which means that the U.S. Government guarantees a grant to all students who show evidence of need. The student must complete the Free Application for Federal Student Aid (FAFSA). This program is for first undergraduate degree students who are U.S. citizens or eligible noncitizens. Students are required to enroll in one or more actual or equivalent credits in a degree granting program. One must maintain good academic standing and make satisfactory progress towards completing a degree. A student enrolled in an undergraduate program may only receive a maximum of 6 years of full time Pell award. This equates to 600% of Lifetime Eligibility Used. Once a student reaches the 600% limit of the Pell award they are no longer eligible. For information about eligibility and the award amount please contact the Financial Aid Office.

Campus-Based Aid Programs

Funds from the three federal programs—Federal Work-Study (FWS), Federal Perkins Loan, and Federal Supplemental Educational Opportunity Grant (FSEOG)—are awarded to eligible students who attend on at least a half-time basis. Except for FSEOG, which is for

undergraduates only, undergraduate and graduate students who are U.S. citizens or eligible noncitizens may apply. Unlike Federal Pell and TAP, these are not entitlement programs; the Free Application for Federal Student Aid form (FAFSA), which is used to apply for most financial aid, should be filed each year before the priority deadline of February 15.

Federal Work-Study Program (FWS)

Students are offered an opportunity to earn wages while pursuing their course of study. Federal Work-Study jobs are available on campus or off campus at an approved public service or non-profit agency. Students can work part-time while classes are in session. During the summer and vacation periods, students may work part-time or full-time.

William D. Ford Federal Direct Loan (Subsidized and Unsubsidized)

Ford Federal Direct Loans enable students in degree granting programs and are enrolled at least half-time to meet educational expenses by borrowing from the federal government at a low interest rate. Dependent undergraduate students may borrow up to \$5,500 for the first year, \$6,500 the second year, and \$7,500 for each remaining year of undergraduate study. Independent undergraduate students may borrow up to \$9,500 for the first year, \$10,500 the second year, and \$12,500 for each remaining year of undergraduate study. Unsubsidized Federal Direct Loans are available to students regardless of income. Applicants must file the FAFSA and a loan application. Students are responsible for the interest payments on unsubsidized loans. For details such as repayment and interest rates, consult the Financial Aid Office.

Exit counseling is required for any student borrower who ceases to maintain at least half-time enrollment (six or more credits).

William D. Ford Federal Direct PLUS Loans

These loans are for parents of dependent students who need additional funds for educational expenses. The parent must be a US citizen or eligible noncitizen. A parent may borrow up to the student's cost of attendance minus any financial aid. Half-time enrollment is required. A credit check is required in order to qualify for a PLUS loan. The Financial Aid Office will determine student eligibility for a William D. Ford Federal Direct Loan before a Federal Direct PLUS Loan can be received. Borrowers with their first Direct Subsidized loan disbursement on or after 7/1/2013 may not receive Direct Subsidized loans for more than 150 percent of the published length of their program. For details such as repayment and interest rates, consult the Financial Aid Office.

Verification

Students who file a FAFSA may be chosen for a process called "verification". When the federal government requires verification, the financial aid office must confirm the information on a student's FAFSA. Items to be verified include adjusted gross income, US taxes paid, education credits, household size, number in college, child support paid, assets and untaxed income. Students chosen for verification cannot receive any disbursements until this process has been completed.

Federal Return to Title IV Policy

Students who cease to be enrolled prior to the end of a payment period or period of enrollment (semester), may have their financial aid package recalculated based on the Federal Return to Title IV regulations. The regulations require that the College calculate the portion of the federal aid a student is entitled to, based on the aid that could have been disbursed had the student remained enrolled and the number of days the student attended classes.

The enrollment status used to calculate financial aid eligibility is set either on the 21st day of classes or at the point the student's financial aid record becomes payable. Updates on Financial Aid certification dates are available in the Financial Aid Office and on its website.

Students who withdraw from some or all classes prior to the earlier of those dates will have their aid recalculated and could lose some or all of

their aid. If a student fails to begin attendance in some or all of their classes, the unattended classes will not be used to calculate their enrollment status for financial aid eligibility. If aid has been disbursed for unattended classes, the student may be required to return funds, with the exception of federal work-study earned, which will not be recouped.

Students who officially withdraw after completing more than 60% of the semester are considered to have "earned" 100% of their federal financial aid, and the College is not required to recalculate their eligibility.

If the Return to Title IV calculation determines that the student is not entitled to a portion of the money that has already been disbursed, the College will return the "unearned" portion to the federal government and the student will be billed for the money that was returned on his or her behalf. A "Negative Service Indicator" will be placed on the student's record until the money has been repaid to the Bursar.

If the calculation determines that the student is entitled to aid that has not been disbursed, the Office of the University Controller will notify the student of his or her eligibility and give the student the opportunity to decline the post withdrawal disbursement. However, post withdrawal disbursements of federal grant aid will automatically be disbursed to the student's account.

To receive a post withdrawal disbursement of loan funds, the student must sign and return the post withdrawal notice, confirming that he or she wants the loan to be disbursed; however, only the first disbursement of a loan may be disbursed after a student has withdrawn.

Other Financial Aid

New York State Scholarships and Awards

Scholarships awarded through the New York State Education Department and administered by the Higher Education Services Corporation (NYSHESC) include the following: New York State Scholarship for Academic Excellence; New York State Achievement and Investment in Merit Scholarship (AIMS); Military enhanced Recognition Incentive and Tribute Scholarship (MARS); Regents Awards for Children of Deceased or Disabled Veterans; Regents Awards for Children of Deceased Police Officers, Firefighters and Corrections Officers; State Aid to Native Americans; New York State World Trade Center Memorial Scholarships; and Veterans Tuition Awards. For further information and application materials, contact NYSHESC (www.hesc.ny.org or 99 Washington Avenue, Albany, New York 12255; Tel: (888) 697-4372) or the New York State Education Department (New York State Education Department 89 Washington Avenue Albany, New York 12234).

Veterans

Veterans and the children of deceased or permanently disabled veterans are encouraged to contact the Office of Veterans Affairs located in Wingate Hall, Room 106. The telephone number is (212) 650-5374.

Macaulay Honors College

Admission to the Honors College is selective and is based on grades, SAT scores, and a full evaluation by the College Honors Committee. Honors College students receive a laptop computer and access to a Macaulay Opportunities Fund grant of up to \$7,500 for the undergraduate experience to be used for global research, and internships. In addition students accepted into the Honors College who are New York State residents, receive full coverage for their tuition.

Students are required to file a FAFSA and TAP applications, and the Honors College tuition waiver may be reduced by the amount of the TAP, Pell, SEOG and NYC Merit Scholarship awards, NYS and other scholarships.

World Trade Center Memorial Scholarship

This scholarship covers the cost of tuition, fees, books and supplies, transportation, and room and board for four full-time academic years. It is awarded to the children and spouses of victims who died or were

severely disabled as a result of the terrorist attacks of September 11, 2001, or as a result of the rescue and recovery efforts related to those attacks. The applicant must be enrolled as a matriculated undergraduate student in a program approved by the Commissioner of Education and must file FAFSA and TAP applications. Financial aid received from other sources will be taken into account when calculating scholarship eligibility.

Federal Aid to Native Americans

To be eligible for these awards, applicants should be a member of, or at least one-quarter degree Indian blood descendant of a member of an American Indian tribe who are eligible for the special programs and services provided by the United States through the Bureau of Indian Affairs, and be accepted for admission to an accredited college pursuing a four-year degree. Further information may be obtained from the local Bureau of Indian Affairs Office or the U.S. Bureau of Indian Affairs, Office of Education (1849 C Street, NW, Washington D.C. 20240-0001).

Alternative Loans

International students, non-matriculated and/or less than half-time students may be eligible to receive a private loan to help with their educational expenses. These loans may require a co-signer and a credit check. Students must contact the lending institution of their choice for information regarding these loans.

City University Supplemental Tuition Assistance Program (CUSTA)

Depending on funding from the New York State Legislature, this program provides supplemental assistance of up to \$100 per year to students who would experience an automatic decrease in their TAP award beginning in the fifth semester. Recipients must be full-time undergraduates, New York State residents, and eligible for maximum TAP. Recipients are chosen from among TAP applicants; students need take no special action.

SEEK Counseling and Student Support Services/The Percy Ellis Sutton SEEK Program

The Percy Ellis Sutton Search for Education, Elevation and Knowledge (SEEK), program is funded by New York state for its legal residents who have been deemed by the College as economically disadvantaged and academically underprepared. Students admitted to City College as SEEK students will receive extensive support services, including tutoring and counseling when needed. In addition, based on family income and financial need demonstrated via the FAFSA, SEEK students may qualify to receive program stipends to assist with the costs of books and supplies, as well as certain mandatory CUNY fees. Since SEEK is designed primarily for full-time students, if qualified, SEEK students are eligible to receive two extra semesters of TAP grant funding, for a maximum of ten semesters. Students must meet specific economic criteria to qualify for admission to the SEEK program. The income limits are based on the federal poverty guidelines and are tied to family size. At the time of their initial admission to the College, students are required to provide IRS tax returns transcripts and other applicable documents as official proof of total family income for SEEK.

Merit-Based Scholarships

The City College of New York Scholarship Program

The City College offers a variety of scholarships to entering freshmen, transfer and continuing students. Criteria for selection vary but may include past academic performance, standardized test scores, evidence of creative promise, financial need, campus involvement, community service, volunteer activities or demonstrated leadership. Scholarship information can be obtained from the College's website or the Office of Admissions (212-650-6977).

New York City Council Scholarship Program

The New York City Council Merit Scholarship rewards New York City high school graduates who have proven their ability to succeed academically while they were in high school. For the 2016-2017 academic year the Scholarship is \$800 per year (\$400 per semester).

Application Form

There is no separate application for the scholarship. Students are automatically considered for the award when they apply for admission to CUNY.

To qualify you must:

- Must be a US Citizen/Eligible Non-Citizen
- Graduate from a New York City high school with at least an 80(B) Col-lege Academic Average (CAA) Pass at least twelve college preparatory courses in high school
- Enroll at a CUNY college as a full-time student within one year of graduating from high school
- Register as a full-time student each semester (except summer) and maintain at least a 3.0 cumulative GPA
- Maintain NYC residency
- Attend CUNY before attending any other post secondary institution

Pursuit and Progress

- You must maintain continuous full-time (12 credits) enrollment within the City University of New York system
- You must maintain a cumulative GPA of 3.0 or higher
- Students pursuing an associate's degree may receive the NYC Council Merit Scholarship for a maximum of six semesters. Those seeking a bachelor's degree are limited to eight semesters of eligibility
- The award is not restored once it has been lost

Student Budgets (Cost of Attendance)

The City University of New York (CUNY) calculates "average living expenses" for each academic year. Living expenses are added to tuition and fee expenses, to equal the "cost of attendance". Items included in the calculation are room and board, transportation, books and supplies, and personal expenses.

2016-17 Cost of Attendance Calculation

Student living with parent:

Room & Board	\$4,290
Transportation	\$1,054
Lunch	\$1,232
Books & Supplies	\$1,364
Personal Expenses	<u>\$1,788</u>
	\$9,728

Student living away from parent:

Room & Board	\$12,486
Transportation	\$1,054
Lunch	\$1,232
Books & Supplies	\$1,364
Personal Expenses	<u>\$4,342</u>
	\$20,478

An updated "Cost of Attendance" will be posted to the City College Financial Aid webpage, under Frequently Asked Questions (FAQ) each academic year.

Satisfactory Academic Progress (SAP) Requirements

Federal Financial Aid - All students must satisfy qualitative and quantitative academic standards in order to remain eligible for federal financial aid. Students will be measured against the Title IV Satisfactory Academic Progress Standards at the end of each spring semester in order to determine eligibility for the upcoming year. Those who fail to meet the academic standards will have their federal aid automatically suspended until they meet the minimum standards. (Students who can document that their failure to satisfy academic requirements were the result of extraordinary or exceptional circumstances may be able to apply for a waiver to receive federal aid for another semester).

New York State Aid - To qualify for a New York State Tuition Assistance Program (TAP) or Aid for Part-time Study (APTS) award, students must meet the applicable New York State Satisfactory Academic Progress standards.

To view the Federal and New York State academic requirements please refer to "Academic Requirements" under "Frequently Asked Questions" in the Financial Aid section of the City College website.

Financial Aid Refunds

A student can receive financial aid refunds in one of three ways:

1. A check mailed to the student's address
2. Direct deposit
3. CUNY Scholar card

For safety and security, direct deposit is strongly recommended.

Financial aid will be applied to a student's outstanding tuition and fees charges first. Remaining funds will be refunded to the student. (Note: TAP and APTS can only be used toward a student's tuition charges).

Study Abroad

Financial aid is available for students who attend an approved study abroad program.

New York State Aid

The New York State Tuition Assistance Program (TAP) may be used for Study Abroad programs. Students must be enrolled full-time and at least twelve (12) of their credits must be contributory to their program of study. Tuition must be paid at the City College of New York or another New York state college or university. A student's TAP award will be contingent on verification that the courses they register for at the foreign institution are contributory toward their program of study as well as meeting all other eligibility criteria. TAP will not cover tuition when City College has an agreement to forward paid tuition funds to a foreign institution.

Federal Aid

Federal financial aid may be used for study abroad programs. Direct loans and Pell grants are the types of aid most commonly used. To qualify for a Direct Student loan students must be enrolled for at least six (6) credits. To qualify for a Federal Pell Grant, students must be enrolled for at least one (1) credit. However, the award amount would be prorated based on the number of credits.

Students must meet federal satisfactory academic progress requirements and all other eligibility requirements. Additionally students who enroll for a non-CUNY study abroad program must submit a Consortium Agreement form as part of the study abroad approval process.

Honors Programs

The City College offers two college-wide honors programs for undergraduates, which are administered by the Honors Center (NA 4/150; 212-650-6917; cityhonors@ccny.cuny.edu).

The City College Honors Program

The City College Honors Program offers selected, high-achieving students in all disciplines a particularly challenging academic program in small classes. The heart of the program is the honors curriculum through which honors students fulfill their general education (Pathways) requirements. While Pathways requirements are determined by a student's major, the honors-level Pathways provides enhanced and enriched classes. Honors Pathways provides an excellent academic base regardless of a student's eventual specialization. Classes are taught by outstanding faculty, who encourage student participation and rigorous study.

Retention in the City College Honors Program requires a cumulative G.P.A. of 3.0 and consistent full-time attendance. Upon successful completion of the honors program, the designation "Liberal Arts Honors" is entered on the student's transcript.

To be eligible for the program as an entering first-year student, a student must have a high school average of at least 90% and appropriate performance on the SAT or ACT standardized tests. New first-year students will be considered for the program if they have applied to the Macaulay Honors College at The City College (see below) or if they have applied for scholarships at City College using the downloadable scholarship application available at <http://ccny.cuny.edu/admissions> under the heading Prospective Students/Admissions/Scholarships.

A small number of incoming transfer and continuing students may be admitted to the program at the discretion of the director. To be considered, these students must have a cumulative G.P.A. of 3.2 or higher, completed fewer than sixty credits and have at least five Pathways courses still to be taken. Transfer students must have applied for admission to City College and submitted the scholarship application form. Continuing students are considered only for fall term admission. The City College Continuing Student Honors Program Application, due by the first Friday in June, is available in the spring term from the Honors Center (NAC Room 4/150, cityhonors@ccny.cuny.edu).

The Macaulay Honors College at The City College

The City College participates in the university-wide Macaulay Honors College, which accepts new freshmen with outstanding academic records. The program, which sponsors students on eight campuses in CUNY, encourages the highest level of academic accomplishment, cross-campus community, career exploration and service.

Among Pathways courses for Macaulay students are four special interdisciplinary seminars focusing on New York City. Additional Pathways courses are chosen from honors and other classes appropriate to the major.

Students are expected to achieve an overall G.P.A. of 3.3 by the end of their first year and maintain a G.P.A. of 3.5 from the end of their second year until graduation. Consistent full-time attendance is mandatory. Upon successful completion of the program, the designation "William E. Macaulay Honors College at The City University of New York" is entered on the student's record.

The program admits only new first-year students. The special application is available for electronic completion and submission at <http://www.cuny.edu/admissions/apply.html>. The application deadline is December 1. Detailed information about additional benefits (including

full-tuition scholarships) and requirements of the Macaulay Honors College can be accessed at www.macaulay.cuny.edu.

Research Honors in the Major

The City College is a research institution strongly committed to scholarship and research on the part of students as well as faculty. Almost every school, division and department has developed a structure within which qualified undergraduate students can pursue independent scholarly, creative or research projects under faculty guidance or can elect to assist a faculty member in a project. Students should have completed all basic requirements and be nearing completion of their specialization before they apply for independent study. In general, they should begin the departmental honors sequence well before they graduate. Faculty will assist eligible students in devising and arranging for cross-disciplinary projects.

In most cases, departmental honors courses are numbered 30100-30300 or 30400. Consult the departmental chair or academic advisor for details. Application for Research Honors must be made to the department by December 10 for the spring term and by May 1 for the fall term.

The Division of Student Affairs

"Students First!" is the motto that guides the work and commitment of our talented and dedicated Student Affairs team. Our team is comprised of the Division of Student Affairs, a group seasoned professionals, and you, the students who care deeply for their peers and who partner with us to provide The City College community with a tremendously rewarding college experience. The Division of Student Affairs is organized into three clusters, each with its own goals for addressing the different components for students' success.

We help students to successfully move through critical transitions, beginning with new student orientation through graduation, professional development, and graduate studies. The Career and Professional Development cluster provides guidance to students as they transition from their college to career path, by providing numerous opportunities for experiential learning through internships and professional development, as well as employment and career services for current students and alumni. Included in the Professional Student Development cluster are the Career and Professional Development Institute, the Office of International Students and Scholar Services, and the Office of Community Standards and Judicial Affairs.

We engage students, their families, and the college community in activities that build relationships and promote college spirit. Student Campus Involvement offers programs that encourage community engagement through the following departments: The office of Student Life and Leadership Development, Athletics and Recreational Sports, the Auxiliary Enterprise Corporation, and the Office of Veterans Affairs.

Student Affairs promotes a holistic model of wellness for all our students. From the dedicated clinical staff in Student Health Services, to our robust athletic and fitness programs, we help students to achieve and maintain a balanced and healthy lifestyle. Thus Health and Wellness Services has been developed as a comprehensive social service network to help link students to appropriate services on campus. The departments housed within Health and Wellness Services are the Office of AccessAbility, the Counseling Center, Student Health Services, Gender Resources and Emergency Grants Programs.

The Division of Student Affairs also offers services to accommodate students whose needs and responsibilities exceed their academic commitments. The Child Development and Family Services Center provides daily childcare and educational services to children and families of City College students. The Division also has a Student Affairs department at the Center for Worker Education to address the needs of working students.

The Division of Student Affairs is located in the Wille Administration Building, Room 204. The telephone number is (212) 650-5426. The Division office will help you to navigate its many programs and services.

Health and Wellness Services

Health and Wellness Services provides programmatic and informational support to help students further their academic and personal growth goals. This office serves as an umbrella for several different departments including the AccessAbility Center (Student Disability Services), the Counseling Center, Student Health Services, Gender Resources, and Emergency grants.

The AccessAbility Center (Student Disability Services)

The AccessAbility Center/Student Disability Services (AAC/SDS) ensures full participation and meaningful access to all of City College's services, programs, and activities that correspond with the Americans with

Disabilities Act of 1990, amended in 2008, Section 504 of the Rehabilitation Act of 1973, the Fair Housing Act of 1968, and other applicable Federal, State, and local non-discrimination laws. AAC/SDS accomplishes this goal through the coordination and implementation of appropriate accommodations and support services for students with disabilities. The Center works actively toward full inclusion in policies, procedures, and practices in the context of accessibility while maintaining essential academic and technical standards. If you are a student with a disability and believe you could benefit from AAC/SDS accommodations and services, please contact the Center via: telephone: (212) 650-5913; or TTY/TTD: (212) 650-8441; or email: disabilityservices@ccny.cuny.edu; or visit in-person at North Academic Center, Room 1/218, during business hours (Monday-Friday, 9:00 am-5:00 pm).

While students can request accommodations at any time, it is best to contact AAC/SDS as early as possible.

Student Health Services

Student Health Services (SHS) is committed to the delivery of quality care to the student population in order to promote, improve and advance the health, well being and overall success of college students as directed by the guidelines of the American College Health Association (ACHA).

Clinical services provided by a full time and part time Registered Nurse. These services are free and confidential to all currently enrolled CCNY students. Medical services include immunizations such as MMR, Hepatitis B, Tdap (Tetanus) and seasonal Influenza, PPD/Tuberculin testing, Health Education and First Aid. SHS arranges for free on-site HIV Testing and health insurance navigators as part of the Affordable Care Act for information and enrollment to various health insurance plans. SHS provides continuity of care with referrals to community based organizations. SHS has also joined the National Campaign for the Prevention of Teen and Unwanted Pregnancy along with other CUNY campuses and is committed to comply with the Campus Sexual Health Initiative by providing students with the education, tools and resources available.

Immunization Requirements:

New York State Public Health Law (PHL) 2165 (1b and Title 10 New York Codes, Rules and Regulations Subpart 66-2 (10 NYCRR Subpart 66-2) mandates that all incoming students, whether full time or part time, born on or after December 31, 1956, must be immunized against measles, mumps, and rubella (MMR) and requires proof of immunity as a requirement for attendance. City College reserves the right to prevent the registration of any applicant who fails to provide a record of immunization or who, otherwise, provides a health risk to the College community.

New York State passed Public Health Law 2167, addressing meningococcal meningitis. In compliance with PHL 2167, all New York State students, regardless of how many credits they take in college, must fill out a Meningococcal Meningitis Response form. Students may download both forms from the Student Health Services website:

<http://www.ccny.cuny.edu/shs>

Student Health Services is located in the Marshak Building, Room J-15 and can be reached at 212-650-8222.

The Counseling Center

The Counseling Center

The mission of the Counseling Center is to assist students in the resolution of any barriers that may hinder their ability to achieve their

highest academic potential, while ensuring their mental health needs are met, regardless of ability to pay. Counselors provide free of charge and confidential short-term, student-centered and culturally informed psychological services from a modern and integrative theoretical orientation, treating all students with respect and recognition of their unique strengths. Counseling offers students a safe, confidential, and nonjudgmental space to voice their concerns and address these concerns with a counselor. Counselors provide students with feedback, they listen, reflect, and validate students' emotions, and they offer support and strategies for coping with challenges. Counseling has been shown to be helpful with a wide range of concerns and is effective for both chronic problems and situational difficulties. Most students learn that counseling offers tremendous benefits in helping them work through problems that are affecting their lives.

The Counseling Center also serves as a liaison to the community, linking students to more intensive and longer term services when needed. Additionally, the Counseling Center is committed to supporting faculty in the identification of students who may benefit from counseling services and reaching students in need.

Services at the Counseling Center include individual counseling, crisis intervention, group counseling, consultation, referral, and psycho-educational activities. Students who are interested in scheduling an appointment or learning about the Counseling Center should call (212) 650-8222, stop by Health and Wellness Services in the Marshak Science Building J-15, or email counseling@ccny.cuny.edu.

The Gender Resources Program

The Gender Resources Program promotes a culture of inclusion of all gender and sexual identities at CCNY while recognizing the intersectionality of oppression, race, religion, class, ability/disability, immigration status and ethnicity. The program provides confidential clinical services to registered CCNY students including crisis support and resources for survivors of sexual assault, intimate partner violence, stalking and interpersonal violence. We nurture and support the LGBTQIA community. Students who are interested in scheduling an appointment or learning more about the Gender Resources Program should call (212) 650-8222, stop by Health and Wellness Services in Marshak Building, Room J-15 or email genderresources@ccny.cuny.edu.

Emergency Grants

The Emergency Grants programs is for currently enrolled students in degree granting programs who are not in debt to the college. These grants can assist students for short-term, non-recurring emergencies with a one-time grant to alleviate the situation. Any matriculated student in good academic standing, who is experiencing a current and unforeseen emergency, is eligible to apply for a grant. Interested students can visit the emergency grant website: <http://www.ccny.cuny.edu/services/resources>

Student Health Services

Student Health Services (SHS) provides clinical services such as immunizations (MMR), basic first aid care, pregnancy testing, contraception education, and PPD testing. These services are available to all current CCNY students and free of charge. SHS also arranges for free on-site HIV Testing and information regarding health insurance options.

Immunization Requirements:

New York State Public Health Law 2165 and 2167, and Title 10 New York Codes, Rules and Regulations Subpart 66-2 (10 NYCRR Subpart 66-2) mandates that all incoming students, degree or non-degree, born after December 31, 1956, must be immunized against measles, mumps, and rubella (MMR). All students (regardless of age) must complete the meningitis response form. Students need to submit the immunization record and meningitis response form before registering for classes.

Students may download forms from the Student Health Services website: <http://www.ccny.cuny.edu/shs>

Student Health Services is located in the Marshak Building, Room J-15 and can be reached at 212-650-8222.

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Emergency Grants

Emergency Grants

Health and Wellness facilitates the Emergency Grant Program for currently enrolled students in degree granting programs who do not owe tuition to the college. These grants can assist students for short-term, non-recurring emergencies with a one-time grant to alleviate the situation. Any matriculated student in good academic standing, who is experiencing a current and unforeseen emergency, is eligible to apply for a grant. Interested students can visit the emergency grant website: www.ccny.cuny.edu

The Department of Student Life and Leadership Development

The Department of Student Life and Leadership Development works collaboratively with undergraduate and graduate student leaders to create an engaging and vibrant co-curricular experience at City College. The office advises and provides assistance to over 170 student organizations in chartering their clubs, planning their activities and offering leadership training. The office also houses the CitySERV program that organizes and matches interested students with volunteer or community service opportunities. Additionally, the SEEDS (Student Empowerment & Engagement Development Series) program and the SLAPC (Student Life Activities Planning Committee) committee offer students the opportunity to get involved in planning campus events while developing leadership skills.

The office also manages the Hoffman Student Lounge, the Game Room, the NAC Ballroom, the Aronow Theater, a computer lab and several conference rooms for use by CCNY students and their organizations. Additionally, the office oversees Orientation Programs for new students, the annual Student Elections and serves as advisor to the Undergraduate Student Government, the Graduate Student Council and all student media. The office is located in NAC 1/210 and the phone number is 212-650-5002.

The City Center

Centrally located near the entrance the North Academic Center and under the auspice of Student Life. The City Center provides a warm and collegial introduction to student life on the City College campus. The Center is staffed by a team of enthusiastic student workers who are dedicated to accommodating not only students' needs but also the rest of the CCNY community as it now includes a variety of campus engagement services such as the ID Services for your CityOneCard, Club Relations, and Club Reservation. This "One-Stop Center" serves as the

key information, resource and referral center for students, faculty, staff and visitors to City College. In addition to sharing vital information about campus resources and facilities the Center provides information on upcoming student events and programs. Stop by and say "Hi" to the staff or call 212-650-7000 x10310 for more information.

Intercollegiate Athletics

The City College of New York features sixteen varsity sports and one club sport (co-ed lacrosse) that compete at the National Collegiate Athletic Association (NCAA) Division III intercollegiate level: eight for women (basketball, soccer, volleyball, tennis, fencing, cross country running, indoor and outdoor track and field) and eight for men (basketball, baseball, soccer, volleyball, tennis, cross country running, indoor and outdoor track and field). The City College of New York Department of Intercollegiate Athletics takes pride in laying a solid foundation built on teamwork, honesty, respect, and sportsmanship. The Department of Athletics does adhere to all City College, City University of New York Athletic Conference (CUNYAC), and National Collegiate Athletic Association guidelines and demonstrates highly ethical behavior in pursuit of excellence.

Our sixteen NCAA sports all have long histories of success and championships, both individual and team. Teams compete in various local, regional, national events and leagues, with primary affiliation being the CUNY Athletic Conference. The primary goal of the college is to provide an environment where student-athletes can excel academically, athletically, and personally. Athletic scholarships are not offered by Division III colleges. Membership on a team is open to all qualified undergraduate students in good academic standing and who meet the NCAA eligibility standards. For more information, contact the Athletics office (Marshak Building, Room 20; 212-650-8228; www.ccnysports.com; www.cunyathletics.com)

The Office of Community Standards

Academic communities exist to facilitate the process of acquiring and exchanging knowledge and understanding, to enhance the personal and intellectual development of its members, and to advance the interests of society. In order to realize its purpose, the College and its members must be free from personal injury or harm; bias or harassment; intimidation or coercion; damage or loss of property; disruption of educational and social activities; unreasonable interference with the exchange of concepts and ideas; and unreasonable interference with the administrative and supporting services offered by the College. Accordingly, all student members of the college community are expected to conduct themselves in a manner that demonstrates mutual respect for the rights and personal/academic well-being of others, preserves the integrity of the social and academic environment, and supports the mission of the college. The Office of Community Standards' chief responsibility is to educate students of their role in maintaining this learning environment and to address behavior that impedes, obstructs, or threatens the maintenance of order and attainment of the aforementioned goals by violating the standards of conduct set forth in the college and University student conduct policies. The Office of Community Standards is also responsible for investigating alleged violations of the institutional rules on student conduct and for the coordination and implementation of the conduct process.

For more information about the Office of Community Standards, the CCNY Rules for Student Conduct and the Student Conduct Process you may visit the City College web site at <https://www.ccnycuny.edu/studentaffairs/community-standards> or contact the Office of Community Standards at 212-650-5009 and grhinehart@ccny.cuny.edu.

The Office of Recreation and Campus Fitness

The Office of Recreation & Campus Fitness provides the campus community with structured competitive athletic events, tournaments, and leagues, as well as access to a wide variety of athletic and fitness facilities. The structured activities of the Intramural program generally takes place during club hours on Thursdays. Some of the events that take place during the semester include basketball, volleyball, badminton, soccer, and tennis. The recreation program offers the campus community opportunities to work out with cardiovascular equipment and weight training in the Wingate Fitness Center. Individuals can swim, play tennis, basketball, volleyball, badminton, soccer, frisbee, or jog in a recreational, non-competitive environment. The recreation program emphasizes enjoyment, health and wellness, social interaction, camaraderie, and physical activity. The intramural programs also offer that along with the challenge of competition with one's peers. (Wingate Hall, 3rd floor; 212-650-6595)

Career and Professional Development Institute

The Career and Professional Development Institute's (CPDI) goal is to provide individual as well as programmatic services to students from their Freshman year to Senior year to help them develop their professional identity which can result in career focused full-time employment at the time of graduation. Students can participate in one of many programs (Explorer Program, CPDI Internship Program, CPDI Senior Recruitment Program, Senior Experience), attend workshops, search CCNY Career Connections for job/internship opportunities, access valuable career information on our website, attend employer on-campus events or schedule an appointment to meet with a career counselor to discuss personal career options.

Child Development and Family Service Center

The Child Development and Family Services Center provides quality child-care and early educational services to the students of City College New York. The Center is currently CLOSED FOR RENOVATIONS.

Alumni Association of the City College

The first graduating class of 1853 of the New York Free Academy (as The City College of New York as originally known) organized the Alumni Association to form a community of friends with a shared experience and common goals. In 1913, the Association was incorporated, and is governed by a Board of Directors. At the Annual Meeting held in the spring, dues paying members elect the officers of the corporation who guide the affairs. Officers who are elected annually include the President, three Vice Presidents, Secretary, Treasurer and Historian. In addition, thirty-six Directors from the membership-at-large are selected for staggered three-year-terms. Two to three Directors from each of the special interest or affiliate groups, including their respective Presidents, are elected annually for one-year terms. The Board of Directors meets a minimum of four times a year.

The purpose and objectives of the Alumni Association are to advance the interests and welfare of the College, to foster a spirit of fraternity/sorority and good will among graduates, to serve alumni and to offer financial, technical and networking support for today's students.

Representing special concerns, interests and educational specialties, the Association serves as the umbrella of fifteen affiliate groups including Alumni Varsity, Architecture Alumni, Art Alumni, Asian Alumni, Black Alumni, Center of Workers Education Alumni, Communications Alumni, Education Alumni, Latino Alumni, Political Science Alumni, ROTC

Alumni, Science Alumni, Young Alumni, Business/ Economics Alumni, and Engineering School Alumni. The groups are each governed by a voluntary Board of Directors with officers and conduct activities to benefit alumni and today's students.

In recognition of the growing geographical diversity of alumni, the chartering of Alumni Chapters began after World War II. Fifty dues paying members living in a city outside the New York metropolitan area can secure a charter from the Alumni Association as an official Chapter. Chapters include Washington, D. C.; Palm Beach/South Florida, Gulf Coast of Florida; Northern California; Southern California; Northern Nevada; Houston, Texas; Northern New Jersey and Connecticut.

Department of Veterans Affairs

The goal of the Department of Veterans Affairs (DVA) is to educate the veterans, guardsmen, and reservists of the United States Armed Forces whose courageous service to their country must be rewarded by investing in their future and ensuring their academic success. The DVA is omitted to recruiting, enrolling, and retaining veteran students and their families. The DVA works in collaboration with the various offices on campus including Student Affairs, Admissions, Accessibility Services, Financial Aid, Registrar, Student Health Services, the Department of Wellness and Counseling, and Affirmative Action to assist veterans in becoming acclimated to college life while obtaining veteran educational benefits and other available resources. Student veterans receive a maximum of 12 military elective credits and a maximum of 12 military credits from non-traditional sources for a total maximum of 24 credits. Credits will be granted for military training courses based on the recommendations from the ACE (American Council on Education) armed forces military evaluation guidelines. (Wingate Hall, Room 107; 212-650-5374)

Housing and Residence Life

The Towers at CCNY is the first residence hall to be built on the CCNY campus. The Towers, located on the South campus, offers a vibrant living and learning experience for all residents (which includes CCNY students, faculty, staff, and students from other CUNY campuses). The Towers consists of 164 fully furnished, air-conditioned suites in four configurations that house one to four students each, as well as a limited number of studio and one-bedroom suites available for faculty housing. All suites have a kitchenette that includes a cooktop stove, a microwave, full -size refrigerator, a sink, cabinets, and countertop space. The Towers offers free wireless internet service throughout the entire building (including resident rooms and lounges), a multipurpose seminar room, a fitness center, a 24-hour security desk, a central laundry facility (free for residents), a community kitchen, and lounge area with a billiards table and large TV with comfortable

seating.

The Residence Life Staff, which consists of resident assistants and professional staff, provides supervision of the building in accordance with CCNY/CUNY policies and procedures. Residence Life also strives to create a sense of community through educational and social programming and serves as a resource to all residents. (The Towers at CCNY, 401 West 130th Street; Phone: 917-507-0070, Email: towers@ccny.cuny.edu; Website:www.ccnytowers.com)

The Office of Off-Campus Housing

This resource allows for students to find housing accommodation around or close to the City College Campus. We provide assistance and counseling to students looking for a room or apartment and want to

know more about the rental process in New York City. Off-Campus Housing operates a website that allows student and faculty to access all the resources that this department provides at their own convenience. We are currently introducing other aspects to the department and website to allow for students to find roommates and find a way to get help for housing. We want to provide as much help as possible for students looking to move around the college, which in turn will boost on-campus activity and increase students' study time and decrease commute time. (Wingate Hall, Room 107; Phone: 212-650-5370, Fax: 212-650-7369)

Department of International Student and Scholar Services

The Department of International Student and Scholar Services provides services and advocacy for international students and scholars who are not permanent residents of the United States. Additionally, it provides pre-semester orientation programs and semester long workshops that assist with adapting to life in the United States while pursuing their education.

The College of Liberal Arts and Science

General Statement

The aims of the College of Liberal Arts and Science (CLAS) are several: firstly, to develop students as broadly cultivated and intelligent citizens of the world in which they live; secondly, to impart to students a critical cast of mind that is agile in its reception of new ideas, and accustomed to the mastery of new skills; thirdly, to educate students so that each may be able to perform some particular function in the community in a worthy and ethical manner. In attaining these goals, students fulfill requirements in a broad range of categories, such as art, literature, foreign language, social science, mathematics and natural science.

Academic Standards

The attainment of high academic standards at The City College entails more than the satisfaction of minimum GPA requirements. Diligent attendance of classes, on-time arrival for each scheduled session, careful preparation for class and timely completion of coursework are also significant factors in ensuring academic success.

Undergraduate Majors and Degrees Offered

The College of Liberal Arts and Science offers courses of study leading to the degrees of Bachelor of Arts, Bachelor of Science, and Bachelor of Fine Arts. A minimum GPA of 2.0 is required to formally declare a major. Some majors have additional requirements. In addition to BA and BS degrees, some departments offer combined B.A./M.A. and B.S./M.S. programs (see individual department listings for further information). Through its constituent divisions:

- Humanities and the Arts
- Interdisciplinary Studies at the Center for Worker Education
- Science
- The Colin L. Powell School for Civic and Global Leadership (formerly the Division of Social Science)

The College of Liberal Arts and Science offers undergraduate degrees in over thirty-five fields. Advisors are available in the office of each divisional Dean to assist students in choosing a major and planning an appropriate academic program.

Degree Requirements

To be awarded a degree by the College of Liberal Arts and Science, all students must:

1. Complete a minimum of 120 credits. These credits are composed of general education requirements, major requirements and free electives.
2. Maintain a minimum "C" or better average (i.e., a G.P.A. of at least 2.0) for all coursework taken at The City College, as well as a minimum G.P.A. of at least 2.0 in their major. (Note that some majors require a higher minimum G.P.A.)
3. Satisfy a residency requirement by completing a total of 80 credits or the final 30 credits at City College, as well as at least 60% of their major at City College.
4. Clear their account of any fees and fines due.

Transfer Students

Most college-level liberal arts and science courses taken at accredited institutions for which the student has earned a grade of "C" or better are transferable. Courses from non-accredited institutions may be

transferable on a limited basis and at the discretion of the major department. Courses from other CUNY institutions with grades less than "C" are transferable (as are those from non-CUNY institutions up to 12 credits and at the discretion of the major department). CUNY Associate Degree holders are guaranteed 60 credits upon transfer. The maximum number of transfer credits is 90. Transferred courses may or may not meet major degree requirements. Students should consult with the academic advisor in the major department for more information.

All transfer students must meet with the designated advisor to discuss the appropriate sequence of courses necessary for their degree.

The Office of Academic Standards

The Office of Academic Standards (OAS) convenes and coordinates the activities of the CLAS Committee on Course and Standing. The committee acts on all matters relating to academic standards such as reinstatement appeals for students who have been dismissed for failure to maintain a minimum 2.0 G.P.A., requests for core/general education substitutions, and appeals by students who seek to withdraw from courses after the institutional deadline has expired. The committee consists of eleven members selected by the CLAS Faculty Council. All student appeals must be submitted in writing with appropriate supporting documents. Faculty who are in agreement with a student appeal may submit letters of support, and advisors may assist the student in preparing the appeal. Neither students nor faculty appear in person before the committee; all appeals are presented to the committee by the Director of Academic Standards, who serves as the non-voting Chair. The Chair may act on the committee's behalf or advise appropriate action. The Chair also communicates the outcome of the appeal to the concerned student and faculty in writing.

Department of Anthropology, Gender Studies, and International Studies (AGIS)

(The Colin Powell School for Civic and Global Leadership, formerly the Division of Social Sciences)

Professor Irina Carlota (Lotti) Silber, Chair • Department Office: NA 7/112 • Tel: 212-650-7361

The City College offers the following undergraduate degree in Anthropology:

B.A. in Anthropology (p. 159)

Programs and Objectives

Anthropology is the holistic study of people across time and space. Looking on humans as both biological and cultural beings, anthropology is inherently interdisciplinary, bridging the humanities, arts, natural sciences, and social sciences. Within the field, the Department of Anthropology at The City College has refined its focus to specialize in the study of inequality and social justice within an urban context, specifically that of New York City. Looking at migration, the diasporas, and transnationalism, the Department is concerned with issues of representation, identity, citizenship and exclusion, as well as race, ethnicity, class, religion, and gender.

With this focus, the Department plays a vital role within the College. It can provide a theoretical and methodological center for various interdisciplinary programs such as Black Studies, Asian Studies, Latin American Studies, and International Studies. It can also provide the cross-cultural perspective necessary for students planning careers in other fields, including engineering, architecture, education, international studies, journalism, medicine and public health, social work, and allied professions. All of these fields require knowledge of

social interaction as well as of the structure and content of culture. This focus also serves the Department's majors well, providing a firm foundation for graduate work for those who choose to go on in the field. Most importantly, it provides all students with a framework for understanding themselves in the context of their community, nation, and world.

Secondary School Teaching

An approved program of courses provides training in both subject matter and teaching methods that prepares the student for New York State certification. Graduates will be eligible to teach in NYS schools. For more information, please consult the Department of Education section of this Bulletin.

Anthropology, Bachelor of Arts (B.A.)

Requirements for Majors

Students majoring in Anthropology must complete the following:

Required Courses

ANTH 20000	Archaeology	3
ANTH 20100	Cross-Cultural Perspectives	3
ANTH 20200	Languages and Dialects in Cross-Cultural Perspective	3
ANTH 20300	Human Origins	3
	One 30000-level course	3

Elective Courses

Additional credits	15
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Subtotal: 30

As many as 6 of the 15 elective credits may be related courses outside the Department of Anthropology from the following programs, departments and schools: Asian, Black, Latin American and Latino, and Jewish Studies programs; the departments of Sociology, Economics, Psychology, Political Science, Biology; and the Schools of Architecture, Biomedical Education and Education. These courses must be chosen in consultation with a departmental advisor.

Grade Point Average Requirements

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Anthropology Minor

Requirements for Minors

Fifteen (15) credits of anthropology courses, not including ANTH 10100. It is recommended that the minor include at least one course from each of the four subfields of anthropology.

Advisement

General Advisors

Students seeking information on Anthropology courses or the major should contact the Anthropology Department Office, NA 7/112, where they will be directed to a faculty member in the appropriate subfield of Anthropology.

Honors Advisor

Please consult the department office.

Facilities and Activities

The Anthropology Student Association

The Anthropology Society is an ongoing student organization that sponsors programs of anthropological interest.

Awards

The Ward Medal

The College gives the Ward Medal annually to the graduating senior demonstrating the greatest proficiency in the field of Anthropology.

St. Clair Drake Award

The Department of Anthropology gives this award annually to a student in recognition of community service.

Audre Lorde Award

The Department of Anthropology gives this award annually to a student in recognition of service to the Anthropology Student Association.

Faculty

Asale Angel-Ajani, Assistant Professor
B.A., New School for Social Research; M.A., Stanford Univ., Ph.D.

Sarah Muir, Lecturer
B.A., Barnard College, M.A., Univ. of Chicago, Ph.D.

Asha M. Samad-Matias, Lecturer
B.A., Hunter College, M.A.; M.A., New York Univ.

Irina Carlota (Lotti) Silber, Associate Professor
B.A., George Washington Univ.; Ph.D., New York Univ.

Stanley I. Thangaraj, Assistant Professor
B.A., Emory Univ.; M.A., Univ. of Chicago; Ph.D., Univ. of Illinois Urbana-Champaign

Professor Emeriti

June Nash, Distinguished Professor

Diane Sank, Professor

Arthur K. Spears, Presidential Professor

Diana Wall, Professor

Department of Art

(Division of Humanities and the Arts)

Professor Anna Indych-López, Chair • Department Office: Compton-Goethals 109 • Tel: 212-650-7421

The City College offers the following undergraduate degrees in art:

B.A. in Art (p. 159)

B.F.A. in Electronic Design & Multimedia (p. 161)

Programs and Objectives

Study in New York City offers an unparalleled opportunity to absorb not only the range and excitement of the current art scene, but also the riches of the past, through cultural resources of exceptional quality. The programs of the Art Department provide both the general student and the pre-professional with a solid foundation in studio art and art history, as well as advanced work in several specialized fields. Formal course work is reinforced with visits to museums, galleries, and artists' studios; guest lectures and critiques; and exhibitions in the Art Department Gallery.

Art, Bachelor of Arts (B.A.)

B.A. Program Concentrations

Studio Art

For Studio Art students, general instruction in the theory and practice of the visual arts is provided along with training that may include a focus in one or more of the following areas: drawing, painting, electronic design and multimedia, printmaking, photography, sculpture, or ceramic design. This focused study may be either broad or narrow, allowing students to build their skills in one or more areas after receiving

foundation training in design. Studio Art students also take art history courses.

Art History

Art History students take introductory survey courses that are multicultural in focus. Advanced courses provide a grounding in historical and current visual culture traditions. Special topic courses are often linked to current museum exhibitions, and professional internships are open to qualified students. This concentration prepares students for career paths in museums and galleries, art publishing, auction houses, art appraisal, teaching art history, archaeology, and other art-related fields. Art History students also take studio art courses.

Digital Design [DGTLDN]

The Digital Design concentration offers art students the opportunity of working in a range of digital media that includes: graphic design for print and electronic publications; imaging and illustration; web development and programming; video; 3D modeling and animation. These media courses are taken after students complete department foundation requirements in design. Students in Digital Design work on technical and creative projects in print- and screen-based media and focus on conceptualization, visual problem-solving, and production skills to build a professional design/media portfolio. Digital Design students also take art history courses. Students electing the Digital Design Concentration will choose 9 credits of coursework from a range of elective courses, 9 credits of 30000-level EDM electives, plus the 3 credit EDM capstone course (ART 49590 (p. 19) Digital Design Portfolio). Depending on the courses selected, students may also need to complete foundational coursework (ART 29500 Typography 1, ART 29510 Graphic Design Concepts, ART 29520 Illustration and/or ART 29526 2D Imaging) that is prerequisite to some of the 3/30000-level EDM courses. See the Advising/Grad Check Sheet for more detail.

Photography

Photography students take courses that provide foundational materials and methods for lens-based art practices; these students choose from mid and upper level courses that provide advanced study in various aspects of photography as an art form. This includes advanced techniques, professional practices, and theory. Special topic and elective courses are offered that engage with the expanded field of photography in New York City and provide portfolio-building opportunities. Students electing the Photography Concentration also take foundation Studio Art and Art History courses. Students choose 9 credits of coursework from a range of elective courses, 9 credits from among the 30000-level Photography courses*, plus the 3 credit Photography Portfolio capstone course. Depending on the courses selected, a student may also need to complete foundational coursework that is the prerequisite for some of the 3/30000-level Photography courses. See the Advising/Grad Check Sheet for more detail.

Teaching Art K-12

Students interested in teaching in schools, community centers, and/or museums pursue coursework in three main areas: studio art, art history, and education. Building on a solid foundation in the theory, history, and practice of creating and analyzing art, students also learn how to create culturally-relevant lesson plans, build community with diverse populations, and teach the arts in multiple settings. Students in this concentration can elect to pursue Initial Certification with the New York State Department of Education that enables them to teach in the public school system in New York. Students seeking their Initial Certification in Art K-12, must complete student teaching requirements via the School of Education. Alternatively, students may opt to teach in out-of-school settings via the non-certification track.

Requirements for Majors

Students are required to have a GPA of 2.5 in order to declare a B.A. or B.F.A. Art major and must maintain that GPA in order to remain in the program.

College Core Courses required for all majors (6 credits)

ART 10000	Introduction to the Visual Arts of the World	3
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ART 21000	Writing about Art	3
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ART 21000: or equivalent

Courses required for all majors (9 credits)

ART 10100	2-Dimensional Design	3
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One course from the following 2-Dimensional Group: (3 credits)

ART 10200	Introduction to Drawing	3
ART 10300	Introduction to Woodcut	3
ART 10310	Introduction to Etching/Bookbinding	3
ART 10400	Introduction to Photography	3
ART 10410	Photography and Visual Perception	3
ART 10500	Introduction to Painting	3

One course from the following 3-Dimensional Group: (3 credits)

ART 10600	Introduction to Sculpture	3
ART 10700	Introduction to Ceramic Design	3
ART 10800	Introduction to Wood Design	3
ART 10900	3-Dimensional Design	3

Total Department Core Credits for All Majors 9

B.A. Concentration Requirements

Students are required to have a GPA of 2.5 in order to declare a BA Art major and must maintain that GPA in order to remain in the program.

Studio Art Concentration

Art History requirements: choose 1 course from Group I; choose 2 courses from Group II; choose 1 course from either group.	12
Studio Art electives	9
Studio Art electives at the 20000-level or above	12

Subtotal: 42

Art History Concentration

Choose 2 courses from Group I; choose 4 courses from Group II; choose 2 courses from either group.

Studio Art electives	6
ART 21090 Research Methods in Art History	3

Subtotal: 42

Art History Group I

ART 21012	Egyptian Art and Architecture	3
ART 21014	Greek and Roman Art	3
ART 21022	Romanesque and Gothic Art	3
ART 21024	Italian Renaissance Art and Architecture	3
ART 21025	Northern Renaissance Art	3
ART 21026	Baroque and Rococo Art in Europe	3
ART 21043	Ancient Art of Meso-America, the Andes, and the Caribbean	3
ART 21052	Islamic Art	3
ART 21053	Art of India and Southeast Asia	3
ART 21054	Art of China, Japan, and Korea	3
ART 21062	History of Art I: Ancient through Medieval	3
ART 31550	The Artist in Society: South Asian Perspectives	3

Art History Group II

ART 21030	Nineteenth Century Art in Europe	3
ART 21032	American Art 1776-1900	3
ART 21036	Early 20th-Century Art in Europe and the United States	3
ART 21038	Postwar Art in the U.S. and Europe	3

ART 21044	Art of Native North America	3
ART 21064	History of Art II: Renaissance through Modern	3
ART 21067	History of Design	3
ART 21068	History of Graphic Design	3
ART 21069	Art Criticism	3
ART 21070	Topics in "Outsider" Art	3
ART 31012	Arts of Africa: An Introduction	3
ART 31013	Contemporary Arts of Africa	3
ART 31106	Issues of Identity in Modern Art	3
ART 31115	Public Art in the U.S.	3
ART 31118	Themes and Methods of African Arts	3
ART 31530	Modern Art in Latin America	3
ART 31531	Modern Mexican Art	3
ART 31532	Contemporary Art in Latin America	3
ART 31534	History of Photography	3
ART 31538	Art Since 1980	3
ART 31553	Asian Art Since 1850: Tradition and Nation	3
ART 31570	"Outsider" Art Environments	3
Digital Design Concentration		
	Art History requirements: choose ART 21067 History of Design or ART 21068 History of Graphic Design PLUS one course from Group I and two courses from Group II	12
	Studio Art or EDM electives	9
EDM	EDM electives at the 30000-level or above, with prerequisites	9
ART 49590	Digital Design Portfolio	3
		Subtotal: 42

Photography Concentration		
	Art History requirements: ART 31534 History of Photography (or any Photography Art History course) PLUS one course from Group I, one course from Group II, and one from either group.	12
	Studio Art or Photography electives	9
	Photography electives at the 30000-level, with prerequisites	9
ART 34000	Photo Portfolio and Projects	3
		Subtotal: 42

B.A. in Teaching Art Concentration

Studio Art:

Any three additional studio courses, including at least one 20000-level, and one 30000-level (9 credits)

Art History:

Any four Art History courses, at least ONE from Group 1 and ONE from Group 2 (12 credits).

ART 15500	Introduction to Art Education	3
ART 25500	Identity and Culture in Art Education	3

Subtotal: 44

Total Credits (including department core)

Students pursuing NY State Certification must apply for and complete the requirements for a Minor in Art Education through the School of Education including the following courses:

EDUC 20500	Adolescent Learning and Development	3
	OR	
EDCE 20600	Observing Children and Their Development	3
SPEDE 32000	Introduction to Inclusive Education	3
EDUC 22100	Urban Schools in a Diverse American Society	3
EDSE 32500	Special Issues for Secondary School Teachers: Literacy and ESL	2
EDSE 41200	Teaching Reading and Writing in Secondary School Subjects	3
	OR	
EDCE 32300	Emergent to Fluent Literacy	3
EDSE 46500	Student Teaching in the High School (Spanish 7-12)	4
EDSE 46301	Seminar on Student Teaching in Secondary Schools	2
EDUC 41900	Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics	0

Subtotal: 22

EDUC 41900: certification only

Honors and Research

Qualified students may be approved for honors work in studio projects (ART 31591-31593) or art historical research (ART 31094-31096).

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Electronic Design and Multimedia, Bachelor of Fine Arts (B.F.A)

Students are required to have an overall GPA of 2.5 in order to declare a BFA Electronic Design & Multimedia major and must maintain that GPA in order to remain in the program.

B.F.A. in Electronic Design & Multimedia

The B.F.A. in Electronic Design and Multimedia (EDM) is a professional program in design for print and interactive media which integrate a variety of digital media into all stages of design and production.

The program emphasizes a foundation in the principles of basic design as the prerequisite to intensive studio practice in design and imaging for a variety of visual communications media. The program builds skills in typography, design and imaging, and visual problem-solving completely integrated into digital technology. Using the industry standards in hardware and software, students gain practice in both concept and production. Students are encouraged to gain practical experience through internships and freelance projects. CCNY students have entree to the resources of New York City's vast publishing and multimedia industries through industry partnerships.

B.F.A. Prerequisites for Admission

Students seeking admission must present a portfolio for review to the EDM admissions committee. The portfolio should demonstrate

aptitude; finished, professional work is not a criterion. The committee is looking for raw ability, talent, and motivation. Students lacking a portfolio may enter the college in the B.A. program, and may apply to the B.F.A. after completing level 10000 and 20000 courses in the major. Transfer students in art must apply before completing 72 credits. Transfer students in other majors are also subject to the 72 credit rule. These students will submit a portfolio of work from those classes and be evaluated by the program's instructors. A GPA of 2.5 will be required for all students to be accepted into the B.F.A. in Electronic Design & Multimedia.

B.F.A. Program Requirements

The B.F.A. Program in Electronic Design and Multimedia requires a total of 75 credits in the major, plus the college core for the B.F.A. of 42 credits, with additional credits in Liberal Arts electives making up the total of 120 credits toward the degree. Students must also fulfill the City College foreign language requirement. These requirements may raise the total credits needed for completion above 120.

B.F.A. Graduation Requirements

B.F.A. students are required to take Senior Thesis and complete a one-semester creative project under faculty supervision. Thesis students mount an exhibition of their projects and prepare a book that includes their thesis and also documents the process of their project in print and digital media. A copy of the book is retained by the department and kept on file with the EDM Program. Additionally, students may be required to complete an internship in an area related to their major concentration.

Requirements for Majors

Students are required to have a GPA of 2.5 in order to declare a B.A. or B.F.A. Art major and must maintain that GPA in order to remain in the program.

College Core Courses required for all majors (6 credits)

ART 10000	Introduction to the Visual Arts of the World	3
ART 21000	Writing about Art	3

ART 21000: or equivalent

Courses required for all majors (9 credits)

ART 10100	2-Dimensional Design	3
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One course from the following 2-Dimensional Group: (3 credits)

ART 10200	Introduction to Drawing	3
ART 10300	Introduction to Woodcut	3
ART 10310	Introduction to Etching/Bookbinding	3
ART 10400	Introduction to Photography	3
ART 10410	Photography and Visual Perception	3
ART 10500	Introduction to Painting	3

One course from the following 3-Dimensional Group: (3 credits)

ART 10600	Introduction to Sculpture	3
ART 10700	Introduction to Ceramic Design	3
ART 10800	Introduction to Wood Design	3
ART 10900	3-Dimensional Design	3

Total Department Core Credits for All Majors 9

Requirements for B.F.A.

Required EDM Courses:

ART 29500	Typography I	3
ART 29510	Graphic Design Concepts	3
ART 29520	Illustration	3
ART 29526	2-D Imaging and Illustration	3
ART 39510	Electronic Design I	3
ART 39512	Print Production	3
ART 39540	Design for the World Wide Web I	3
ART 39552	Programming for Artists	3
ART 39560	Digital Video I	3

ART 39590	Critical Issues in Design, Technology and New Media	3
ART 49590	Digital Design Portfolio	3
ART 49598	Senior Thesis	6

Of the five required elective courses (15 cr.) for the B.F.A., a minimum of two (6cr.) must be selected from Art courses at the 400-level. (15 credits)

One of the following two: (3 credits)

ART 21067	History of Design	3
ART 21068	History of Graphic Design	3

Three Art History courses at the 20000 level or above:

One of these courses must be from group I (Visual Arts of the Ancient to Early Modern Worlds), and two courses must be from group II (Visual Arts of the Modern World) (9 credits)

Total B.F.A. Credits (including department core) 75

Honors and Research

Qualified students may be approved for honors work in studio projects (ART 31591-31593) or art historical research (ART 31094-31096).

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Art Minor

The minor in Art consists of six courses (18 credits). Art minors will have a broad and flexible choice of courses to fulfill their minor requirements. Students will choose the courses to fulfill their minor requirements in consultation with Art Department faculty advisors.

Required Courses

Studio Art Option:

ART 10100	2-Dimensional Design	3
	Four studio art electives, at least one of which must be at the 20000-level or above	12
ART	One art history elective at the 20000 level or above (except ART 21000)	3

Art History Option:

ART 10100	2-Dimensional Design	3
	Four art history electives at the 20000 level or above	12
	One studio art elective at the 20000 level or above	3

Facilities

Art Gallery

The Art Department's gallery space displays work of undergraduates, graduate students, and professional artists, as well as specially curated exhibitions. Approximately 2000 sq. ft. in size, the gallery accommodates two- and three-dimensional art.

Ceramic Design

The facilities include a large open work area with 18 pottery wheels and a slab roller, extruder, and a kiln room with three electric kilns. There is a plaster studio where students learn mold-making. Various clay bodies are used for utilitarian, sculptural and architectural ceramics, with equal emphasis on clay's multicultural traditions (e.g., Egyptian paste and majolica).

Electronic Design & Multimedia

The electronic design studio incorporates four dedicated computer classrooms/labs, a Digital Output Center, and a design studio classroom, facilitating interaction between traditional and digital design production. The computer labs are configured with industry-standard computers configured with hardware and software for a complete range of print and digital applications, including: design, illustration and imaging, print and electronic publishing, animation, video, 3D modeling and animation, web design and web programming and other applications that integrate digital media design and art. Labs provide access to color laser printing and scanning and patch station for audio output and digital video projection. Students have access to medium and large-format archival inkjet printing and checkout of cameras and other media equipment through the Digital Output Center. Payment for printing is through lab fees or credit card. With an open studio policy for currently enrolled students, the lab is available over 60 hrs./wk. under the supervision of the lab manager, faculty, and lab assistants. This facility mirrors the real-world graphics environments found in industry in order to better prepare students for positions in the field.

Painting and Drawing

The painting and drawing rooms are equipped with architectural-quality drafting tables and large easels. Each studio has wall space for critiques and large-scale projects. Model platforms, mat cutters, props and tools for the construction of painting supports are available. The Art Visual Resource Library maintains a collection of slides of student work for reference.

Photography

The photography facilities include a black & white darkroom, color darkroom, a color processing lab, advanced digital lab, and shooting studios/classrooms. Equipment includes: Speedotron, Bowens Calumet Travelite flash systems, as well as Arri and Lowell hot lights, large-format Omega enlargers, a 30" Colenta processor, and a NuArc mercury exposure unit. Cameras available for student use Mamiya 7 and RZ medium format systems, Cambo and Toyo 4x5 cameras. A four station advanced digital lab is equipped with iMac stations, Imacon Flextight X1, Nikon 5000EDLS, Epson XL10000, Epson 750 scanners, and Epson 3880 and 4880 printers. The David and Lenore Levy Collection of Contemporary Photography is available for student and faculty study in all areas of the Art Department.

Printmaking

The studio is equipped for the teaching of intaglio, lithography, relief processes including woodcut and lino-cut, collagraph, carborundum aquatint, water-based silk-screen, photo-printmaking in etching, silkscreen and lithography, and combinations of all the print media. There are three etching, one relief and two lithography presses, a 62" x 62" NuArc plate maker with a deep well blanket, plate cutter, large hot plate, aquatint box, large aluminum bed for lithographic plates, lithographic stones in a full range of sizes, queen size drying rack, numerous rollers of various durometers and dimensions, hydrobooth and hydroblaster for silk screen and a large copy camera to facilitate the production of oversized images. The integration of equipment for digital and photographic processes with conventional printmaking equipment allows for the full range of printmaking experiences.

Sculpture

The sculpture studio facility is amply equipped for the creation of traditional and non-traditional three-dimensional art. It accommodates various techniques including wood assemblage, construction, woodcarving, plaster, clay, and stone carving. There is a small efficient area for metal fabrication with metal working tools including mig welders and plasma cutters. The studio also houses a basic wood design shop with a table saw, jointer, surfacing tools, hand tools, and several band saws.

Visual Resources Library

Consisting of over 120,000 digital images and slides of works from prehistoric times to the present, the collection includes painting, sculpture and architecture of the Americas, Africa, Asia, and Europe, as well as ceramics, ivories, metalwork, manuscripts, printmaking,

photography, textiles, interior design and comparative materials. The library also provides access to 500,000 art images through its subscription to ARTStor.

Department Activities

Art Department

The Art Department sponsors exhibitions, guest lectures and appearances by visiting artists throughout the academic year. Student exhibitions are organized each year in the Art Gallery.

Student Art Societies

Student organizations have been formed around topics of art history, electronic design and multimedia and photography. These groups are open to all students and generally promote and stimulate various forms of art at the college.

Awards and Scholarships

The Art Department grants the following annual awards, including:

The Albert P. D'Andrea Award

For excellence in art and scholarship.

The Dean's Prize in Art

Provides framing for a student work selected for a year-long loan to the Dean's office.

The George William Eggers Art Alumni Achievement Award

For excellence in a specific field of art.

The Holly T. Popper Art Scholarship

For an outstanding graduating female City College art major to study in an M.F.A. program in the Art Department.

The Provost's Prize in Art

Provides framing for a student work selected for a year-long loan to the Provost's office.

The Joe Harris Scholarship

An annual award of excellence for one or two students of color who are pursuing studies in photography.

Seymour Peck Scholarships and Creative Awards in the Arts

For a sophomore or junior demonstrating an overall proficiency in art.

The Therese McCabe Ralston Connor Awards

For art majors with promise of outstanding achievement.

The Jacob Rothenberg Award for Excellence in Art History

For an outstanding student in the MA in Art History program or an undergraduate student concentrating in art history.

The James R. Steers Prize

For general excellence in art.

Faculty

Molly Aitken-Zaidi, Associate Professor
B.A., Harvard Univ.; M.A., Columbia Univ., M.Phil., Ph.D.

Becca Albee, Associate Professor
B.A., Evergreen State College; M.F.A., Univ. of North Carolina Chapel Hill

Patterson Beckwith, Lecturer
B.F.A., Cooper Union; M.F.A., Univ. of California (Los Angeles)

Colin Chase, Associate Professor
A.A.S., Fashion Institute of Technology; B.F.A., Cooper Union; M.F.A., Univ. of Michigan

Joshua Cohen, Assistant Professor
B.A., Vassar College; Ph.D. Columbia Univ.

Marit Dewhurst, Assistant Professor
B.A., Univ. of Michigan; Ed.M., Harvard University, Ed.D.

Megan Foster, Lecturer
B.F.A., Rhode Island School of Design; M.F.A., Columbia Univ.

Leopoldo Fuentes, Assistant Professor

B.F.A., California State Univ. (Los Angeles); M.F.A., Northwestern Univ.

Ethan Ham, Associate Professor
B.A., Univ. of California, Santa Cruz; M.F.A., Portland State Univ.

Ellen Handy, Associate Professor
B.A., Barnard College; Ph.D., Princeton Univ.

Craig Houser, Lecturer
B.A., Carleton College; M.A., Hunter College; M. Phil., CUNY Graduate Center, Ph.D.

Anna Indych-López, Associate Professor
B.A., New York Univ., M.A., Ph.D.

Lise Kjaer, Lecturer
M.F.A., Academy of Fine Arts (Poland); M. Phil., CUNY Graduate Center, Ph.D.

Abby Kornfeld, Assistant Professor
B.A., Cornell University; M.A. New York Univ., Ph.D.

Joseph Moore, Assistant Professor
B.F.A., Atlanta College of Art; M.F.A., Bennington College

Hajoe Moderegger, Associate Professor
M.F.A., Bauhaus-University Weimar (Germany)

Sylvia Netzer, Professor
B.A., City College; M.F.A., Columbia Univ.

Ina Saltz, Associate Professor and Chair
B.F.A., Cooper Union

Harriet F. Senie, Professor
B.A., Brandeis Univ.; M.A., Hunter College; Ph.D., New York Univ.

Mark Smith, Assistant Professor
B.F.A., Georgia State Univ.; M.F.A., School of the Art Institute of Chicago

Tom Thayer, Lecturer
B.F.A., Northern Illinois Univ., M.F.A.

Annette Weintraub, Professor
B.F.A., Cooper Union; M.F.A., Univ. of Pennsylvania

Professors Emeriti

Robert E. Borgatta

Sherman Drexler

Madeleine Gekiere

Michi Itami

Irving Kaufman

Jay Milder

Seong Moy

Elizabeth O'Connor

George Nelson Preston

Joan Webster Price

Asian Studies Program: Area Studies, Bachelor of Arts (B.A.)

(Division of Humanities and the Arts)

General Information

The City College offers the following undergraduate degree in Area Studies: Asian-Latin American & Latino-Russian:

B.A. (p. 164)

Programs and Objectives

The Program in Asian Studies offers an interdisciplinary concentration.

Asian Studies: Area Studies Bachelor of Arts, B.A.

Requirements for Majors

Students are required to take a total of 30 credits related Asian Studies. At least 24 credits must be above the 20000 level. Students who are proficient in Asian languages may use their language ability to fulfill requirements of up to six credits. A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.0 and above to graduate with a BA in Asian Studies.

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Asian Studies Minor

Requirements for Minors

Students are required to take a total of 15 credits of courses related to Asian subjects. Of those credits, at least 9 must be above the 20000 level. Students who are proficient in Asian languages may use their language ability to fulfill requirements of up to six credits.

Advisement

Advisors are available in the program office.

Majors in the Department of Asian Studies are expected to maintain a minimum GPA of 2.5. Those who fall below that number will be called in for a conference with a departmental advisor to discuss ways of improving academic performance. The advisor may recommend taking a particular course for better preparation, meeting with a tutor in the Writing Center, taking a course load lower than 15 credits, or other strategies for achieving academic success. All students should try to maintain the highest possible GPA in order to enhance their prospects for acceptance to graduate programs and career opportunities.

Courses from Other Departments

Students are encouraged to take appropriate courses in other departments with the permission of their advisors.

Some courses that may be of interest are listed below.

ART 28500	Art:China-Jap-Korea	3
PSC 34100		
PSC 34200		
HIST 25100	Traditional China	3
HIST 25300	Modern China	3
HIST 25400	Traditional Japan	3
HIST 25500	Modern Japan	3
HIST 26300	Traditional Civilization of India	3
HIST 26400	Modern India	3

Faculty

The faculty of the program includes those professors who teach the program's courses and those whose departmental courses may be credited to the major.

Department of Biology

(Division of Science)

Professor Karen Hubbard Chair • Department Office: MR 526 Tel: 212-650-6800

The City College offers the following undergraduate degree in Biology:

- B.S. in Biology** (p. 165)
- B.S. in Biotechnology** (p. 166)
- B.S./M.S. in Biology (Combined Degree)** (p. 167)
- Minor in Biology** (p. 168)

Programs and Objectives

The Department of Biology offers courses in several areas, including Physiology, Neuroscience, Cell, Molecular, & Developmental Biology, and Ecology, Evolution, and Behavior.

The Biology core curriculum covers a broad range of topics from molecular biology to ecosystems. Courses emphasize the fundamental principles of biology and incorporate the scientific method to gain deeper understanding. Evolution is emphasized as an organizing theme throughout.

Elective courses allow students to investigate a variety of biological processes and phenomena, and to explore the relationships among organisms. Qualified advanced students are encouraged to take Independent Study or Honors (research) and may also take selected graduate courses.

The Department cooperates with the Program in Premedical Studies (PPS), a program of the Division of Science. PPS features a curriculum that specifically prepares participants to meet medical, dental, optometry, podiatry and veterinary school admission requirements. Students may major in Biology while participating in PPS.

Research Opportunities

The Biology Department has an active undergraduate research program. Students who wish to do laboratory research may enroll for Independent Study (BIO 31001, Bio 31002 or Bio 31003) if their Biology GPA is above 3.0, or, if their Biology GPA is above 3.5, Honors (BIO 30100-30300). Up to 6 of the credits from these courses may be applied to the major's elective requirements. Students interested in research should consult with the Honors and Independent Study Committee. Financial support for research during the academic year and the summer may be available through a variety of grant sponsored programs.

Foundational Courses

Foundational courses for all undergraduate programs for Biology must be completed before embarking upon related courses in the major. Students with appropriate background as demonstrated by the College's Placement Exam may be exempted from some or all Foundational Courses. The foundational course for Calculus I (Math 20100) is Pre-Calculus (Math 19500), and this course must be passed with a grade of C or higher in order to proceed to the next level.

Biology, Bachelor of Science (B.S.)

Requirements for BS in Biology

Math and Science Courses

CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 26100	Organic Chemistry I	3
PHYS 20400	General Physics II	4
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
	OR	
MATH 20500	Elements of Calculus	4
MATH 20900	Elements of Calculus and Statistics	4
	OR	
MATH 20100	Calculus I	3
MATH 20900	Elements of Calculus and Statistics	4
	OR	
MATH 20100	Calculus I	3

MATH 20200	Calculus II	3
MATH 17300	Introduction to Probability and Statistics	4
		Subtotal: 26-29

MATH 20900: With permission of Math Department

Biology Requirements

Required Courses (Core Curriculum)

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
BIO 20600	Introduction to Genetics	4
BIO 20700	Organismic Biology	4
BIO 22800	Ecology and Evolution	4
BIO 22900	Cell and Molecular Biology	4
	Additional advanced electives	15
		Subtotal: 39

BIO 10100, BIO 10200: Students with an AP Biology score of 4 or 5 or who pass an exemption examination may waive these courses and receive 6 credits. Students transferring to City College with one year of College Biology with laboratory (grade C or better) will receive credit for BIO 10100 and BIO 10200 if the course coverage is sufficiently similar. Students applying for transfer credit for BIO 10100 and BIO 10200 should consult the syllabi for these courses to ensure comparability.

Additional advanced electives: Majors will not be permitted to register for Biology Core or elective courses unless the Biology course prerequisites have been passed with a grade of C or higher. Human anatomy and physiology courses taken at CCNY or at other colleges will not be credited toward the Biology major. Microbiology courses taken at other colleges must have their syllabi evaluated for credit. Six credits of research courses (Independent Study, Honors) can count towards this total.

The Biology Department revised its core sequence in 2001. Students who started in the Biology core prior to 2001 should consult with the department for advice on course equivalencies.

Honors

To qualify for Honors it is necessary to complete nine hours of Honors credit, six of which may count towards the 15 credits of Biology electives. The successful Honors candidate submits a thesis approved by his/her advisor and based upon the student's original research and approved by the advisor.

Additional Requirements

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements (Pathways) (p. 286) section of the Bulletin for more information. Biology students will satisfy their "Pathways" requirements most efficiently by following these recommendations:

Fixed Core

English Composition I:

FIQWS	Freshman Inquiry Writing Seminar	6
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English Composition II:

ENGL 21003	Writing for the Sciences	3
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Mathematical and Quantitative Reasoning:

MATH 20100	Calculus I	3
	OR	
MATH 20500	Elements of Calculus	4

Life and Physical Sciences:

BIO 10100	Biological Foundations I	4
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Flexible Core**World Cultures and Global Issues:**

any CLAS offerings in this category

Individual and Society:

any CLAS offerings in this category

U.S. Experience in its Diversity:

any CLAS offerings in this category

Creative Expression:

any CLAS offerings in this category

Scientific World:

BIO 10200 Biological Foundations II 4

Additional course in Scientific World:CHEM 10301 General Chemistry I 4
OR**College Option****Speech**SPCH 11100 Foundations of Speech 3
Communication
OR

SPCH 00380

*or exemption on the basis of demonstrated proficiency***Foreign language**

Two semesters of college-level study, or exemption on the basis of two years of high-school level study, or demonstrated proficiency

Philosophy

any CLAS offerings in this category

Residency Requirement

24 of the 39 total Biology course credits required for the Biology Major must be taken at City College. 46 of the 76-78 total Biotechnology credit requirements must be taken at City College.

Biology Major GPA Requirement: A GPA of 2.0 or higher in the major is required to maintain Major status and for graduation. The GPA in the major is calculated from all Biology Dept. major courses taken at CCNY or by ePermit.**Biotechnology Major GPA Requirement:** A GPA of 3.0 or higher in the major is required to maintain Major status and for graduation. The GPA in the major is calculated from all Biotechnology major courses taken at CCNY or by ePermit. To declare a Biotechnology major, a student must have a GPA of 3.0 or higher.**Minimum course grade requirements:** Biology BIO 10100, BIO 10200, BIO 20600, BIO 20700, BIO 22800, and BIO 22900 must all be passed with a grade of 'C' or higher. To enroll in a Biology course, students must pass all Biology course prerequisites with a grade of 'C' or higher.Note that courses in other departments that count towards Biology elective credit ***DO NOT*** count towards the 24 credits.**Biotechnology, Bachelor of Science (B.S.)****The BS Degree in Biotechnology**

This interdisciplinary program trains students in the many aspects of biotechnology, taking advantage of modern molecular biological, chemical, and biophysical tools to modify living organisms for a specific purpose (such as for drug development, improved agricultural crops, and environmental cleanup). The core program provides a thorough grounding in biology, chemistry, and physics and their applications to biotechnology. Electives allow students to explore their specific interests and to prepare them for the workforce or further graduate

education. Students gain practical experience by a required research component through independent studies or honors research programs.

Requirements for the BS Degree in Biotechnology**Math, Science, and Ethics Requirements**

CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 26100	Organic Chemistry I	3
CHEM 26200	Organic Chemistry Laboratory I	2
CHEM 26300	Organic Chemistry II	3
CHEM 32002	Biochemistry I	3
PHYS 20400	General Physics II	4
	OR	
PHYS 20700	University Physics I	4
MATH 20500	Elements of Calculus	4
MATH 20900	Elements of Calculus and Statistics	4
	OR	
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 17300	Introduction to Probability and Statistics	4
	OR	
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
PHIL 34905	Biomedical Ethics	3
		Subtotal: 38-40

Biology and Major Elective Requirements for Biotechnology**Required courses:**

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
BIO 20600	Introduction to Genetics	4
BIO 22900	Cell and Molecular Biology	4
BIO 48300	Laboratory in Biotechnology	5

Six credits of

BIO 31000	Independent Study	1-3
	OR	
BIO 30100-30300	Honors I-III	3

*BIO 30100-30300: Research credits may be taken in Chemistry or Physics (CHEM/PHYS 3100X OR 30100-302000-30300)***Additional Advanced Electives (11 credits)****Electives may include**

SCI 28000	Bioinfo & Biomol Sys	3
BIO 35000	Advanced Microbiology	4
BIO 35400	Introduction to Neurobiology	3
BIO 35500	Introduction to Analysis of Scientific Literature Using CREATE	4
BIO 37500	Developmental Biology	3
BIO 37900	Developmental Neurobiology	3
BIO 38000	Eukaryotic Genetics	4
BIO 41000	Cell Development and Cellular Senescence	3
BIO 42000	Virology	3
BIO 42500	Cancer Biology	3
BIO 48100	Introduction to Epigenetics	3
CHEM 33500	Physical Biochemistry	5
CHEM 40600	Environmental Chemistry	3

CHEM 48005	Biochemistry II	3
PHYS 31500	Medical Physics	3
PHYS 42200	Biophysics	3
PHYS 52200	Biomedical Physics	3
		Subtotal: 38

Additional Requirements

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements (Pathways) (p. 286) section of the Bulletin for more information. Biology students will satisfy their "Pathways" requirements most efficiently by following these recommendations:

Fixed Core

English Composition I:

FIQWS	Freshman Inquiry Writing Seminar	6
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English Composition II:

ENGL 21003	Writing for the Sciences	3
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Mathematical and Quantitative Reasoning:

MATH 20100	Calculus I	3
	OR	

MATH 20500	Elements of Calculus	4
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Life and Physical Sciences:

BIO 10100	Biological Foundations I	4
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Flexible Core

World Cultures and Global Issues:

any CLAS offerings in this category

Individual and Society:

any CLAS offerings in this category

U.S. Experience in its Diversity:

any CLAS offerings in this category

Creative Expression:

any CLAS offerings in this category

Scientific World:

BIO 10200	Biological Foundations II	4
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Additional course in Scientific World:

CHEM 10301	General Chemistry I	4
	OR	

PHYS 20300	General Physics I	4
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College Option

Speech

SPCH 11100	Foundations of Speech Communication	3
	OR	

SPCH 00380

or exemption on the basis of demonstrated proficiency

Foreign language

Two semesters of college-level study, or exemption on the basis of two years of high-school level study, or demonstrated proficiency

Philosophy

any CLAS offerings in this category

Biology, Bachelor of Science/Master of Science (B.S./M.S.)

The Combined BS/MS Degree in Biology

The goal of the joint degree is to better prepare Biology students for careers in academia, medicine, and the biotechnology and pharmaceutical industries. The Biology Department's strength in research enables highly motivated undergraduates to concentrate on biological research and to take graduate-level courses in their chosen specialty for an additional year. Students fulfill their required undergraduate and Master's course requirements while performing cutting-edge research in one of the three biological sub-disciplines: Molecular, Cell, & Developmental Biology, Neurobiology, or Ecology, Evolution, and Behavior & Evolutionary Biology. Combining the two degrees affords the student increased flexibility in designing their course plans and provides them with consistent advisement.

A total of 142 credits are required for the BS/MS in Biology. The requirements include a total of 64 biology course credits of which 30 credits must be 400-level or graduate-level courses (A, B, C or V designations). A minimum of 8 of these 30 credits must consist of graduate-level courses designated C or V, excluding V9200, V9201 and V9100. Students must maintain at least a 3.0 overall average.

Requirements for the BS/MS Degree in Biology

Math and Science Requirements

Mathematics, Chemistry, and Physics requirements are identical to those for the B.S. degree in Biology (p. 165).

Biology Requirements

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
BIO 20600	Introduction to Genetics	4
BIO 20700	Organismic Biology	4
BIO 22800	Ecology and Evolution	4
BIO 22900	Cell and Molecular Biology	4
BIO 30100-30300	Honors I-III	3
	OR	
BIO 31000	Independent Study	1-3
BIO B9901	Thesis Research	3
BIO B9902	Thesis Research	3
BIO V9200	Tutorial	
BIO V9201–V9204	Advanced Study	1-4
BIO V9100	Colloquium	1

Subtotal: 47

BIO B9901, BIO B9902, BIO V9200, BIO V9201: Students fulfill their Masters research requirements through a combination of these courses. No more than 6 credits of research can be taken per semester.

Additional Biology Electives (17 credits)

30 credits must be at the 400- or graduate-level courses. A maximum of 8 of these 30 credits may consist of 400-, A, and B level courses (excluding B9901 and B9902). A minimum of 8 of these 30 credits must consist of graduate-level courses with C or V designations, excluding V9100 and all V920x courses. Students must maintain a minimum 3.0 overall GPA.

Subtotal: 64

Additional Requirements

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements (Pathways) (p. 286) section of the Bulletin for more information. Biology students will satisfy their

"Pathways" requirements most efficiently by following these recommendations:

Fixed Core

English Composition I:

FIQWS Freshman Inquiry Writing Seminar 6

English Composition II:

ENGL 21003 Writing for the Sciences 3

Mathematical and Quantitative Reasoning:

MATH 20100 Calculus I 3

OR

MATH 20500 Elements of Calculus 4

Life and Physical Sciences:

BIO 10100 Biological Foundations I 4

Flexible Core

World Cultures and Global Issues:

any CLAS offerings in this category

Individual and Society:

any CLAS offerings in this category

U.S. Experience in its Diversity:

any CLAS offerings in this category

Creative Expression:

any CLAS offerings in this category

Scientific World:

BIO 10200 Biological Foundations II 4

Additional course in Scientific World:

CHEM 10301 General Chemistry I 4

OR

PHYS 20300 General Physics I 4

College Option

Speech

SPCH 11100 Foundations of Speech Communication 3

OR

SPCH 00380

or exemption on the basis of demonstrated proficiency

Foreign language

Two semesters of college-level study, or exemption on the basis of two years of high-school level study, or demonstrated proficiency

Philosophy

any CLAS offerings in this category

Students are required to write a Master's thesis and defend it before a panel of three faculty members. Please email Prof. Jonathan Levitt at jlevitt@ccny.cuny.edu for more details on thesis requirements and Prof. Jay Edelman at jedelman@ccny.cuny.edu for general questions related to the B.S./M.S. degree.

Biology Minor

Requirements for the Minor

Required Courses:

BIO 10100 Biological Foundations I 4

BIO 10200 Biological Foundations II 4

BIO 20600 Introduction to Genetics 4

One of the following three:

BIO 20700 Organismic Biology 4

BIO 22800 Ecology and Evolution 4

BIO 22900 Cell and Molecular Biology 4

Subtotal: 16

Only students taking BIO 20600 in Fall 2009 may complete only 15 Biology credits for the minor.

Advisement

The Department provides advice and information on career opportunities, programs and opportunities for financial support. Prospective biology majors should email the Head Undergraduate Advisor, who will sign the Majors form. All Biology majors will be assigned a faculty advisor. Students needing advice on planning elective programs should consult with their faculty advisor. Non-majors seeking advice on individual courses should consult with the Head Undergraduate Advisor.

TO DECLARE A MAJOR IN BIOLOGY

Head Undergraduate Advisor (including transfer students)

Fardad Firooznia
MR 5th Floor - Room 517
212-650-6580
Email: ffirooznia@ccny.cuny.edu

Head Advisor for B.S. Program in Biotechnology

Christine Li
Room CDI - 3N Room 13384
212-650-8450
Email: cli@ccny.cuny.edu

Head Advisor for B.S./M.S. Program in Biology

Jay Edelman
MR 7th Floor - Room 734
212-650-8461
Email: jedelman@sci.ccnycuny.edu

Premedical Studies

Belinda Smith, Director
MR 5th Floor - Room 529
212-650-7845
Email: bsmith@sci.ccnycuny.edu

ePermits

Christine Klusko
MR 5th Floor - Room 526
212-650-6802
Email: cklusko@ccny.cuny.edu

Tutoring

Special tutoring services are available to those students needing help in Biology. Students seeking to avail themselves of such services are directed to the Division of Science Advising Center/CCAPP Administrative Office located on the first floor of the Marshak Building, Room 108.

Facilities

Resource Center

The Resource Center of the Department of Biology (MR 502) maintains a wide variety of reference materials for student use in conjunction with many of the undergraduate courses. Instructors will inform students as to the availability of materials available for their course. The facility is open Monday through Friday (hours are posted outside MR 502).

Imaging Complex

The Imaging Complex houses a transmission electron microscope, a scanning electron microscope, a confocal microscope, a digital darkroom, and complete support facilities for tissue preparation. In addition to its use in several courses, the facility supports faculty and student research in many aspects of cellular biology.

Departmental Activities

The Caduceus Society

The Caduceus Society, a student-run organization, provides programs for those interested in the biological and biomedical sciences.

Awards

The following awards are made annually to deserving students on the basis of merit and superior scholarship in biology:

The Edmund Baermann Scholarship in Natural Sciences

To a sophomore or junior completing the Biology core. Selection is based on performance in the Biology core.

The Sharon D. Cosloy Scholarship

To a junior who demonstrates potential in research and who will pursue graduate work in the biomedical field.

The August Anthony Gavasci Award

To a student demonstrating promise in research in the fields of Microbiology or Molecular Biology.

The Professor Joseph Grossfield Memorial Scholarship

To a senior who excels in biology courses and in the humanities.

The Professor Paul L. Krupa Award for Excellence in Research

To the student completing Honors or Independent Studies who demonstrates the greatest proficiency in research.

The Professor Paul Margolin Scholarship

To a sophomore or junior who demonstrates creativity in research.

The Olivia McKenna Award

To a graduating senior demonstrating the greatest research proficiency in Neuroscience.

The Sylvia F. Rubin/Martin Saks Award

To the student demonstrating the greatest proficiency in research in Environmental Science.

The Professor William Stratford Prize

To the student demonstrating the greatest proficiency in both course work in zoology and zoological research.

The Ward Medal

To the student with the best overall record in his/her Biology courses.

Courses in other Departments that count towards Biology Elective Requirements

The following non-Biology courses count towards the Biology Major electives and will be used to calculate the GPA in the Biology major, **but they do not count towards the Biology Department residency requirement.**

Non- Biology Courses

CHEM 32002	Biochemistry I	3
PHIL 34905	Biomedical Ethics	3
PHYS 42200	Biophysics	3
SCI 28000	Bioinfo & Biomol Sys	3

Graduate Courses Open to Undergraduates

Qualified undergraduate students may take selected graduate courses. Permission of the Instructor, and the Biology Department advisors or the Deputy Chair must be obtained before a student may register for these courses. The courses are described in the Graduate Bulletin of The City College.

Faculty

Robert P. Anderson, Professor
B.A., Kansas State University; Ph.D., University of Kansas

Amy Berkov, Assistant Professor
BFA., University of Colorado; Ph.D., CUNY

Avrom Caplan, Professor
B.Sc., University of Sussex (U.K.); Ph.D., University of London (U.K.)

Ana Carnaval, Associate Professor
B.S., Universidade Federal do Rio de Janeiro (Brazil), M.S.; Ph.D., University of Chicago

Jay A. Edelman, Associate Professor
A.B., University of California (Berkeley), Ph.D. University of California (Berkeley) San Francisco

Mark Emerson, Assistant Professor
B.A., Oberlin College; Ph.D. Harvard University

Fardad Firooznia, Lecturer
B.S., Yale University; Ph.D. Cornell University

Jane C. Gallagher, Professor
B.S.-A.M., Stanford University; Ph.D., University of Rhode Island

Shubha Govind, Professor
B.S., M.S., Delhi University (India); Ph.D., University of Illinois (Urbana-Champaign)

Yevgeniy Grigoryev, Lecturer
B.S., Hunter College, CUNY; Ph.D., Scripps Research Institute

Michael Hickerson, Associate Professor
B.S., The Evergreen State College; M.S., Western Washington University; Ph.D., Duke University

Sally Hoskins, Professor
B.S., University of Illinois (Urbana-Champaign); Ph.D., University of Chicago.

Karen Hubbard, Professor and Chair
B.A., Barat College; Ph.D., Illinois Institute Of Technology

Anuradha Janakiraman, Associate Professor
B.Sc., Presidency College (India); M.Sc. University of Calcutta (India); M.S. Kent State University; Ph.D. University of Illinois (Urbana-Champaign) Medical School

Jonathan B. Levitt, Professor
B.A., University of Pennsylvania; M.A., Ph.D., New York University

Christine Li, Professor
A.B., Columbia University; M.S.; Ph.D., Harvard University

David Lohman, Associate Professor
B.S., Bradley University; A.M., Ph.D., Harvard University

Hysell V. Oviedo, Assistant Professor
B.A., B.S., Richard Stockton College; Ph.D., New York University

Mark Pezzano, Associate Professor
B.S., William Paterson University; Ph.D., CUNY

Robert Rockwell, Professor
B.S., Wright State University; M.S., Ph.D., Queen's University, Kingston (Canada)

Andrey Rudenko, Assistant Professor
B.S., M.S. Kharkiv National University (Ukraine); D.Phil., Oxford University (U.K.)

Adrian Rodriguez-Contreras, Associate Professor
B.Sc., Universidad Nacional Autonoma de Mexico; Ph.D., University of Cincinnati

Shireen Saleque, Associate Professor
B.Sc., M.Sc., Calcutta University (India); M.A., M.Phil., Columbia University; Ph.D., Albert Einstein College of Medicine

Tadmiri R. Venkatesh, Professor
B.S., Univ. of Mysore (India); M.S., Ph.D., Birla Institute of Technology and Science (India)

Bao Q. Vuong, Assistant Professor
B.S., Cornell University; M.A., M. Phil., Ph.D., Columbia University

Oseola Whitney, Assistant Professor
B.S., Lincoln University; M.S., Florida A&M University; Ph.D., Florida State University

Professors Emeriti

Donald Cooper
 Robert P. Goode
 Joseph Griswold
 Jerry Guyden

John J. Lee
 Daniel Lemons
 Linda H. Mantel
 Olivia McKenna
 James A. Organ
 Joseph Osinchak
 Janis Roze
 Carol Simon
 John H. Tietjen
 Aaron O. Wasserman
 Ralph C. Zuzolo

Black Studies Program

(Division of Humanities and The Arts)

Professor Cheryl Sterling, Director • Program Office: NA 6/108 • Tel: 650-8117

The City College offers the following undergraduate degree in Area Studies:

B.A. (p. 170)

Programs and Objectives

Black Studies is a body of knowledge reflecting global African peoples' participation in and contribution to the evolution, development and civilizations of mankind. It is a multidisciplinary program, encompassing a broad-based approach to the Africana experience within the context of human evolutionary development, history, race, ethnicity, and politico-economic interrelationships. The scholarship and teaching of Black Studies emanates from a set of distinct principles that are based on the interconnectedness of African and African Diaspora peoples' diverse experiences. Scholarship and teaching in Black Studies involves the interdisciplinary creation and dissemination of knowledge about peoples of African descent from a perspective that places Black people at the center of their own experiences. Fundamental to this venture is the intent not only to study the world but also to actively engage in transforming it. Black Studies interrogates the methods, paradigms and assumptions of the various disciplines in the humanities, social sciences, arts, and natural sciences not only as a corrective but also as an independent discipline that produces its own body of knowledge, methods and theories. This distinguishes Black Studies from an interest in black issues based on traditional disciplinary paradigms, which often marginalize, minimize or neglect black people and lack a component of advocacy for social change. The program curriculum offers academic training in various interdisciplinary approaches, methods, interpretations, ethics, philosophies, and ideologies. Students are offered the opportunity to be placed in community-based organizations for at least one year.

The CCNY Black Studies program offers geopolitical, socioeconomic and cultural concentrations in Africa, the Caribbean and African-America.

Structure of Curriculum

The courses of the Black Studies program are categorized under four subject matter areas and three geopolitical areas. Through guidance, students interested in identified subject matter areas will be able to develop an individual plan of study.

Subject Matter Areas

Black World Development
 African American Socio-Economy
 Latin American and Caribbean Socio-Economy
 Special Topics and Independent Studies

Geopolitical Areas

African
 African-American
 Caribbean-Brazilian

Black Studies: Area Studies, Bachelor of Arts (B.A.)

Requirements for Majors

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.0 and above to graduate with a BA in Black Studies.

Required Courses

BLST 10100	African Heritage and the Afro-American Experience	3
BLST 10200	African Heritage and the Caribbean-Brazilian Experience	3

Elective Courses

Black Studies	24
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Subtotal: 30

Additional Requirements

In addition to major requirements, all Black Studies majors must complete the following:

1. General Education Requirement including FIQWS, FQUAN, Perspective and In-depth requirements (for students who entered after Fall 2007) or Old Core Requirement, including ENGL 11000, ENGL 21000 or equivalent, and the Writing Across the Curriculum requirement (for students who entered before Fall 2007)
2. Classical and Modern Language Requirement
3. SPCH 11100 or the Speech Proficiency Test

For more information, please consult the chapter entitled General Education Requirements (p. 286) at the end of this Bulletin.

Black Studies Minor

Requirements for Minors

Required Courses

BLST 10100	African Heritage and the Afro-American Experience	3
BLST 10200	African Heritage and the Caribbean-Brazilian Experience	3

Elective Courses

Four approved courses	12
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Subtotal: 18

Program Activities

Program Activities include: Institute for Research on the African Diaspora in the Americas and the Caribbean,

Awards

- Black Faculty and Staff Annual Scholarship Awards
- Annual Convocation Awards for Outstanding Services
- Wilfred Cartey Award for Africana Literary and Creative Excellence
- Edward Scobie Award for Africana Social Science Research
- Marshariki Chaney Award for Achievement and Community Service

Advisement

Professor Venus Green

NA 4/120, 212-650-8656

Courses in other Departments

In addition to the courses listed above, many courses from other divisions and departments of the College may be accepted towards the degree. Please consult the Program Director and Program Advisor each semester for a list of acceptable courses.

Faculty

The faculty of the program includes those professors who teach the program's courses and those whose departmental courses may be credited to the major.

Department of Chemistry and Biochemistry

(Division of Science)

Professor Daniel Akins, Chair • Department Office: MR 1024 • Tel: 212-650-8402

General Information

The City College offers the following undergraduate degree in Chemistry:

B.S. in Chemistry (p. 171)

B.S./M.S. in Chemistry (Combined Degree) (p. 173)

Programs and Objectives

The Department of Chemistry and Biochemistry, established in 1849, offers instruction and research training in the following areas:

- Analytical Chemistry
- Biochemistry
- Environmental Chemistry
- Inorganic Chemistry
- Organic Chemistry
- Physical Chemistry

The B.S. program is available for students planning to go into advanced study, government service, the health professions, and secondary school education. There are a number of pathways by which students may specialize in chemistry. The Standard Chemistry curriculum is the program of choice for those who have not yet decided upon their specific career goals and who wish to maximize their opportunities. The Environmental Concentration is for students wishing to pursue an industrial or graduate career in the environmental sciences. Students taking this concentration are trained to identify the effects of chemical species on the environment, to trace the sources, reactions and fates of such species and to devise chemical methods for treating environmental problems and bringing them under control. The Secondary Education Concentration is for students who plan to become secondary school teachers upon graduation. Detailed curricula for each concentration may be obtained by phoning or visiting the Department Office.

There is no "premed major" as such at City College. Premedical students major in biochemistry, biology, chemistry or some other discipline while

completing the requirements for admission into medical school. The Department cooperates closely with the Program in Premedical Studies (PPS), a program of the Division of Science. This program features a curriculum which integrates a variety of learning experiences specifically preparing participants to meet the requirements of medical, dental and veterinary schools, and also the requirements for admission into physician's assistant and physical therapy advanced degree programs.

Honors Research and Independent Study

The Department of Chemistry and Biochemistry maintains an active undergraduate research program. Students may receive up to 9 credits for their research work by enrolling in Honors (CHEM 30100-30400) or Independent Study (CHEM 31001-31004) with permission of the Undergraduate Research Supervisor. Financial support for research may be available for some students through a variety of grant-sponsored programs.

Chemistry, Bachelor of Science (B.S.)

Requirements for Majors

A GPA of 2.0 or higher in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

Foundational Courses

Foundational courses for all undergraduate programs for Chemistry must be completed before embarking upon related courses in the major. Students with appropriate background as demonstrated by the College's Placement Exam may be exempted from some or all Foundational Courses. The foundational course for Calculus I (MATH 20100) is Pre-Calculus (MATH 19500), and this course must be passed with a grade of C or higher in order to proceed to the next level. The foundational course for General Chemistry I (CHEM 10301) is Pre-Calculus (MATH 19500), and this course must be passed with a grade of C or higher in order to proceed to the next level.

Non-Chemistry Core Requirements

BIO 10100	Biological Foundations I	4
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
PHYS 20700	University Physics I	4

One of the following two:

EAS 10600	Earth Systems Science	4
BIO 10200	Biological Foundations II	4

All Chemistry majors must complete "Chemistry Core Courses" and either the "Standard Chemistry Concentration" or one of the alternative concentrations. Students may also elect to satisfy the American Chemical Society Certification (p. 173) requirements.

Chemistry Core Courses

Required Courses

CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 24300	Quantitative Analysis	4
CHEM 26100	Organic Chemistry I	3
CHEM 26300	Organic Chemistry II	3
CHEM 27200	Organic Chemistry Laboratory I	3
CHEM 33000	Physical Chemistry I	3
Subtotal: 24		

Standard Chemistry Concentration

Required Courses

CHEM 32002	Biochemistry I	3
CHEM 33100	Physical Chemistry Laboratory I	2

CHEM 33200	Physical Chemistry II	3
CHEM 37400	Organic Chemistry Laboratory II	3
CHEM 42500	Inorganic Chemistry	3
CHEM 43400	Physical Chemistry and Chemical Instrumentation Laboratory II	3

CHEM 33100: Spring semester only

CHEM 43400: Fall semester only

Subtotal: 17

Biochemistry Concentration

Required Courses

CHEM 32002	Biochemistry I	3
CHEM 32004	Biochemistry Laboratory I	2
CHEM 37400	Organic Chemistry Laboratory II	3
CHEM 43500	Physical Biochemistry	5
CHEM 48005	Biochemistry II	3
BIO 10200	Biological Foundations II	4

CHEM 43500, CHEM 48005: Spring semester only

One of the following two:

BIO 20600	Introduction to Genetics	4
BIO 22900	Cell and Molecular Biology	4

Subtotal: 24

Environmental Concentration

Required Courses

CHEM 32002	Biochemistry I	3
CHEM 33100	Physical Chemistry Laboratory I	2
CHEM 33200	Physical Chemistry II	3
CHEM 37400	Organic Chemistry Laboratory II	3
CHEM 40600	Environmental Chemistry	3
CHEM 40601	Environmental Chemistry Laboratory	2
CHEM 40700	Environmental Organic Chemistry	3
CHEM 42500	Inorganic Chemistry	3
CHEM 43400	Physical Chemistry and Chemical Instrumentation Laboratory II	3

CHEM 33100: Spring semester only

CHEM 43400: Fall semester only

Subtotal: 25

Secondary Education Concentration

Major requirements are listed below. Pedagogical requirements are listed in the Department of Education (p. 245) section in this Bulletin.

Required Courses

CHEM 33100	Physical Chemistry Laboratory I	2
CHEM 33200	Physical Chemistry II	3
CHEM 43400	Physical Chemistry and Chemical Instrumentation Laboratory II	3

Subtotal: 8

Additional Requirements

All Chemistry majors must maintain a C average in Chemistry courses. No courses beyond General Chemistry may be taken unless a C is obtained in all prerequisite courses (or permission is received from the Chair).

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements (Pathways) (p. 286) section of the Bulletin for more information. Chemistry students will satisfy their

"Pathways" requirements most efficiently by following these recommendations:

Fixed Core

English Composition I:

FIQWS	Freshman Inquiry Writing Seminar	6
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English Composition II:

ENGL 21003	Writing for the Sciences	3
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Mathematical and Quantitative Reasoning:

MATH 20100	Calculus I	3
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Life and Physical Sciences:

CHEM 10301	General Chemistry I	4
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Flexible Core

World Cultures and Global Issues:

any CLAS offerings in this category

Individual and Society:

any CLAS offerings in this category

U.S. Experience in its Diversity:

any CLAS offerings in this category

Creative Expression:

any CLAS offerings in this category

Scientific World:

BIO 10100	Biological Foundations I	4
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Additional course in Scientific World:

CHEM 10401	General Chemistry II	4
	OR	

PHYS 20700

College Option

Speech

SPCH 11100	Foundations of Speech Communication	3
	OR	

SPCH 00380

or exemption on the basis of demonstrated proficiency in a foreign language

Foreign Language

two semesters of college-level study, or exemption on the basis of two years of high-school level study

Philosophy

any CLAS offerings in this category

Chemistry Minor

Procedure for declaring a Minor in Chemistry:

The student, no matter which major they have declared, must meet with the chemistry minor advisor, Prof. Glen Kowach.

Requirements:

CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 26100	Organic Chemistry I	3
CHEM 26300	Organic Chemistry II	3
CHEM 26200	Organic Chemistry Laboratory I	2

Two of the Following:

CHEM 33000	Physical Chemistry I	3
CHEM 32002	Biochemistry I	3

CHEM 42500	Inorganic Chemistry	3
CHEM 40600	Environmental Chemistry OR	3
CHEM 40700	Environmental Organic Chemistry	3
Subtotal: 23		

American Chemical Society Certification For American Chemical Society Certification

Students wishing to receive American Chemical Society Certification must complete the requirements for their chosen option and the following courses.

Standard Chemistry Concentration

Three graduate level courses chosen
in consultation with the advisor 8-11

Graduate level courses: (may include up to six credits of Honors Research/Independent Study or three credits of Honors Research/Independent Study and three credits of Environmental Chemistry)

Biochemistry Concentration

CHEM 42500	Inorganic Chemistry	3
Two graduate level courses chosen in consultation with the advisor		5-10

Graduate level courses: (may include up to six credits of Honors Research/Independent Study or three credits of Honors Research/Independent Study and three credits of Environmental Chemistry)

Secondary Education Concentration

CHEM 32002	Biochemistry I	3
CHEM 42500	Inorganic Chemistry	3
CHEM 37400	Organic Chemistry Laboratory II	3

Premedical or Predental Students

Pre-medical or pre-dental students who are not chemistry or biochemistry majors are required to take the following:

Required Courses

CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 26100	Organic Chemistry I	3
CHEM 26300	Organic Chemistry II	3
CHEM 26200	Organic Chemistry Laboratory I	2

Elective Courses

If additional chemistry electives are desired, the following courses are recommended:

CHEM 24300	Quantitative Analysis	4
CHEM 33000	Physical Chemistry I	3
CHEM 33500	Physical Biochemistry	5
CHEM 37400	Organic Chemistry Laboratory II	3
CHEM 45902	Intr Biochemistry	3
CHEM 45904	Biochemistry Lab	2
CHEM 48005	Biochemistry II	3

Students Planning Graduate Work

For students planning graduate work in chemistry, the following additional courses are recommended:

Mathematics:

MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
Experience in statistics and		

computer science.
Reading proficiency in at least one
language with a significant
scientific literature.

Chemistry, Bachelor of Science/Master of Science (B.S./M.S.)

The Combined BS/MS Degree

The primary purpose of the B.S./M.S. degree program is to prepare chemistry majors for positions in industry. In addition, students who want to strengthen their preparation for graduate and professional schools would also benefit from this program. The combined B.S./M.S. degree program is designed to be completed in five years, and is research intensive. Students will complete three semesters of undergraduate research plus another two semesters of research at the graduate level which culminates in a master's thesis.

Prospective students are expected to have a strong undergraduate background in the sciences and a desire to perform research. Students will be considered for admission generally during their junior year after they meet the requirements for admission to the Chemistry major and have three of the five required core Chemistry courses for this program. A total of 75 credits must be fulfilled before an application will be considered. Students must have a 3.0 minimum GPA in chemistry courses and a 3.0 overall GPA. Furthermore, students must be working on a research project with a mentor. A recommendation letter from the research mentor on the student's ability to conduct scientific research will be required. A total of 145 credit hours is required to complete the combined B.S./M.S. degree program, and students will benefit from early faculty advisement and mentoring.

Requirements for Majors

A GPA of 2.0 or higher in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

Foundational Courses

Foundational courses for all undergraduate programs for Chemistry must be completed before embarking upon related courses in the major. Students with appropriate background as demonstrated by the College's Placement Exam may be exempted from some or all Foundational Courses. The foundational course for Calculus I (MATH 20100) is Pre-Calculus (MATH 19500), and this course must be passed with a grade of C or higher in order to proceed to the next level. The foundational course for General Chemistry I (CHEM 10301) is Pre-Calculus (MATH 19500), and this course must be passed with a grade of C or higher in order to proceed to the next level.

Non-Chemistry Core Requirements

BIO 10100	Biological Foundations I	4
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
PHYS 20700	University Physics I	4
One of the following two:		
EAS 10600	Earth Systems Science	4
BIO 10200	Biological Foundations II	4

Chemistry Core Courses

All Chemistry majors must complete "Chemistry Core Courses" and either the "Standard Chemistry Concentration" or one of the alternative concentrations. Students may also elect to satisfy the American Chemical Society Certification requirements.

Required Courses

CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4

CHEM 24300	Quantitative Analysis	4
CHEM 26100	Organic Chemistry I	3
CHEM 26300	Organic Chemistry II	3
CHEM 27200	Organic Chemistry Laboratory I	3
CHEM 33000	Physical Chemistry I	3
		Subtotal: 24

Requirements for BS/MS Degree

General Requirements

General Education Requirements 21

BS Degree Requirements

BIO 10100	Biological Foundations I	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 24300	Quantitative Analysis	4
CHEM 26100	Organic Chemistry I	3
CHEM 26300	Organic Chemistry II	3
CHEM 27200	Organic Chemistry Laboratory I	3
CHEM 33000	Physical Chemistry I	3
CHEM 33100	Physical Chemistry Laboratory I	2
CHEM 33200	Physical Chemistry II	3
CHEM 37400	Organic Chemistry Laboratory II	3
CHEM 43400	Physical Chemistry and Chemical Instrumentation Laboratory II	3
CHEM 32004	Biochemistry Laboratory I	2
EAS 10600	Earth Systems Science	4
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 39100	Methods of Differential Equations	3
PHYS 20700	University Physics I	4
		Subtotal: 68

Electives

CHEM	Chemistry Electives	9
		Subtotal: 9

Honors Research

	Honors Research I	3
	Honors Research II	3
	Honors Research III	3
		Subtotal: 9

Total BS Degree Credits 107

MS Degree Requirements

CHEM B1000	Inorganic Chemistry	5
CHEM B5000	Organic Mechanisms	5
CHEM B9901-B9905	Thesis Research	10
CHEM A8200	Chemistry-Physics-Engineering Seminar I	1
CHEM A8300	Chemistry-Physics-Engineering Seminar II	1

MS Chem Electives: (10 credits)

Any combination of Chemistry MS courses that total 10 credits.

Total MS Degree Credits 32

Total Credit Hours: 139

Advisement

All students, including premedical and pre dental students, planning to concentrate in chemistry should consult a Concentration Advisor.

Chemistry

Professor John Lombardi
MR 1119; 212-650-6032

Biochemistry

Professor Michael Green
MR 1130; 212-650-6034

Undergraduate Research Supervisor

Professor Glen Kowach
MR 1116; 212-650-5247

Exemption Examinations

Professor Glen Kowach
MR 1116; 212-650-5247

Undergraduate Research Programs

Minority Access and Research Careers (MARC) Research Initiative for Scientific Enhancement (RISE)

Professor Mark Steinberg
MR 629; 212-650-8560

Center for Analysis of Structures and Interfaces (CASI)

Professor Daniel Akins
MR 1120; 212-650-6953

Pathways Bioinformatics and Biomolecular Center

Professor David Gosser
MR 1102; 212-650-8870

CUNY Institute for Macromolecular Assemblies

Professor Ruth Stark
MR 1208; 212-650-8803

CENTER for Exploitation of Nanostructures in Sensors and Energy Systems (CENSES)

Professor Daniel Akins
MR 1120; 212-650-6953

Tutoring

Limited tutoring services are available for general chemistry students in the Chemistry Learning Center (MR 1029) during each school day. Additional tutoring is offered through CCAPP and several undergraduate research programs.

Seminars

The Department of Chemistry and Biochemistry sponsors weekly seminars on topics of current interest. Advance notice of these seminars will be posted near Room 1024, and all interested students are invited to attend.

Awards, Prizes and Scholarships

Each year the Department presents a number of awards and prizes to its outstanding students.

Baskerville Award

J. Birnbaum Scholarship Award

Frank and Rose Brescia Award

Ernest Borek Scholarship

Freshman Handbook Award

Benjamin Harrow Memorial Award

Robert and Frances Hochman Scholarship

Arthur G. Levy Prize

Seymour Mann Scholarship

Marks Neidle Memorial Prize

Max Pavey Scholarship

Ward Medal in Chemistry

Graduate Courses Open to Undergraduates

Qualified students with departmental approval may take any course available in the master's programs or the first year of the doctoral programs in Chemistry or Biochemistry. These courses are described in their appropriate bulletins.

Faculty

Daniel L. Akins, Professor and Chair

B.S., Howard Univ.; Ph.D., Univ. of California, Berkeley

Valeria Balogh-Nair, Professor

B.Sc., Univ. of Louvain (Belgium); Ph.D., Univ. of Louvain (Belgium)

Teresa Badosz, Professor

B.S., M.S., Univ. of Mining Metallurgy (Cracow, Poland); Ph.D., Technical Univ. of Cracow

Ronald Birke, Professor

B.S., Univ. of North Carolina; Ph.D., M.I.T.

Mark Biscoe, Assistant Professor

B.A., Wesleyan Univ.; Ph.D., Columbia Univ.

Sean Boson, Lecturer

B.S., M.S., Jahangirnagar Univ., (Bangladesh); Ph.D., Univ. of Cambridge (UK)

Zimei Bu, Associate Professor

B.Eng., Chengdu Univ., of Science & Technology, (China); Ph.D., Louisiana State Univ.

David H. Calhoun, Professor

B.A., Birmingham-Southern College; Ph.D., Univ. of Alabama

Dorthe Eisele, Assistant Professor

Dip.-Phys (MS equiv), Technical Univ. of Berlin; Dr.rer.nat (Ph.D. equiv), Humboldt Univ. of Berlin

Kevin Gardner, Einstein Professor of Chemistry, Director of the ASRC Structural Biology Initiative

B.S., Univ. of California, Davis; Ph.D., Yale Univ.

Ranajeet Ghose, Associate Professor

B.Sc., Presidency College (India); M.S. Yale Univ.; Ph.D., Yale Univ.

David K. Gosser, Professor

B.S., St. Joseph's Univ.; Ph.D., Brown Univ.

Michael E. Green, Professor

A.B., Cornell Univ.; M.S., Yale Univ., Ph.D., Yale Univ.

Edward Hohenstein, Assistant Professor

B.S., Washington College; Ph.D., Georgia Institute of Technology

Urs Jans, Associate Professor

Diploma in Chemistry, Swiss Federal Inst. of Technology; Ph.D., Swiss Federal Inst. of Technology

David Jeruzalmi, Professor

B.S., Univ. of Cincinnati; M.S., Ph.D., Yale University

George John, Professor

B.S., Univ. of Kerala (India); Ph.D., Univ. of Kerala (India)

Reza Khayat, Assistant Professor

B.S., Univ. of California, Irvine; M.S., Ph.D., Columbia University

Glen Kowach, Associate Professor, Exemption Examinations and Minor Advisor

B.S., Univ. of Wisconsin, Madison; Ph.D., Cornell Univ.

Mahesh Lakshman, Professor

B.S., University of Bombay (India), M.S.; Ph.D., University of Oklahoma

Themis Lazaridis, Professor

Diploma in Chemical Engineering, Aristotle Univ. (Greece); Ph.D., Univ. Of Delaware

John R. Lombardi, Professor

A.B., Cornell Univ.; M.A., Harvard Univ.; Ph.D., Harvard Univ.

Stephen O'Brien, Associate Professor

B.Sc., Sussex Univ. (UK); D. Phil., Oxford Univ. (UK)

Kevin Ryan, Associate Professor

B.S., Providence College; M.S., Univ. of Rochester; Ph.D., Univ. of Rochester

Issa Salame, Lecturer and Master Teaching Fellow

B.S., The City College; M.Phil., CUNY; Ph.D., CUNY

Simon A. Simms, Associate Professor

B.S., The City College; Ph.D., Princeton Univ.

Ruth Stark, Distinguished Professor

A.B., Cornell Univ., Ph.D. Univ. of California (San Diego)

Mark L. Steinberg, Professor

B.A., Univ. of Michigan; Ph.D., Univ. of Pennsylvania

Maria Tamargo, Professor

B.S., Univ. of Puerto Rico; M.S., Johns Hopkins Univ.; Ph.D., Johns Hopkins Univ.

Barbara Zajc, Professor

B.S., Univ. of Ljubljana M.S.; Univ. of Ljubljana Ph.D., Univ. of Ljubljana

Professors Emeriti

John S. Arents

Theodore Axenrod

Vernon G.S. Box

Thomas Haines

Neil McKelvie

Jack I. Morrow

Stanley R. Radel

Henri L. Rosano

Charlotte S. Russell

Horst Schulz

Amos Turk

Arthur E. Woodward

Department of Classical and Modern Languages and Literatures

(Division of Humanities and the Arts)

Professor Carlos Riobó, Chair • Department Office: NA 5/223 • Tel: 212-650-6731

The City College offers the following undergraduate degree in Romance Languages:

B.A. (p. 177)

Programs and Objectives

The Department of Classical and Modern Languages and Literatures offers undergraduate courses in: Arabic, Bengali, Chinese, Classical Greek, French, German, Hebrew, Hindi, Italian, Japanese, Latin, Linguistics, Portuguese, Spanish, and Yiddish.

Placement Examinations

All students beginning language study at CCNY must take a placement examination. Students should arrange to take the placement examination as early as possible before starting language study.

If a student is placed at the level of Exempt, he or she will be considered to have fulfilled the foreign language requirement (no credits are granted for the exam). In the event that the student is not placed at the

level of Exempt, he or she has two options: to finish the language requirement in the language in which the placement exam was taken, or to take another language.

The Department of Classical and Modern Languages and Literatures also either administers competency examinations in various languages in which it offers no courses or facilitates the search for institutions that administer such examinations. Students may take a competency examination to be considered for exemption from the Classical or Modern Language Requirement. Students who wish to be examined for competency in a language in which the Department offers no courses must identify an instructor within the CUNY system who would be able to evaluate their language competency, and submit the name of the faculty member to the Department of Classical and Modern Languages and Literatures. An exam will be administered and evaluated in collaboration with that faculty member.

For more information about placement and competency exams, please contact the Department of Classical and Modern Languages and Literatures or visit its webpage.

Advisement

Students wishing to take courses in any of the listed languages should consult with a designated faculty member. Call or visit the department office for the most up-to-date information, NA 5/223, 212-650-6731.

Arabic

Professor Amr Kamal
NA 6/320D; 212-650-7929

Chinese

Professor I-Hsien Wu
NA 5/223F; 212-650-8120

Classical Studies

Professor Jennifer Roberts
NA 6/343; 212-650-6397

French

Professor Maxime Blanchard
NA 320B; 212-650-7932

Professor Bettina Lerner
NA 6/320A; 212-650-7935

Ms. Nelly Saint-Maurice
NA 6/359; 212-650-7667

Hebrew

Dr. Amy Kratka
NA 5/223E; 212-650-6790

Dr. Roy Mittelman
NA 5/218C; 212-650-7522

Italian

Ms. Corinna Messina-Kociuba
NA 5/223E; 212-650-5042

Professor Devid Paolini
NA 5/223G; 212-650-6385

Japanese

Professor Richard Calichman
NA 5/223K; 212-650-7495

Spanish

Dr. Regina Castro McGowan
NA 6/336A; 212-650-6382

Ms. Corinna Messina-Kociuba
NA 5/223E; 212-650-5042

Spanish Linguistics

Professor Edwin Lamboy (courtesy appointment)
NA 6/207B; 212-650-6243

Professor Dulce García
NA 6/364; 212-650-7921

Majors in the Department of Classical and Modern Languages and Literatures are expected to maintain a minimum GPA of 2.5. Those who fall below that number will be called in for a conference with a departmental advisor to discuss ways of improving academic performance. The advisor may recommend taking a particular course for better preparation, meeting with a tutor in the Writing Center, taking a course load lower than 15 credits, or other strategies for achieving academic success. All students should try to maintain the highest possible GPA in order to enhance their prospects for acceptance to graduate programs and career opportunities.

Tutoring Office

The Department offers tutoring in various languages. Tutors are advanced students who have been recommended by the faculty. Tutoring hours are posted outside the department office, NA 5/223.

Department Activities

Clubs

The Department sponsors the following student clubs:

- **Lumières**, for students of Francophone cultures.
- **Spanias**, a student association devoted to the appreciation of Iberian and Latin American culture.
- **Italian Club**, a space outside the classroom where students can practice the language, as well as further their knowledge of the culture and history of Italy.

Honor Society

Students who meet the necessary scholastic requirements may apply to become members of the National Honor Society:

- **Sigma Delta Pi** (Spanish)

Cultural Activities

Lectures by members of the Department and by other distinguished scholars in the field are periodically given on campus. See the Department's website for a list of current events:
<http://www.ccnycuny.edu/fll/index.html>

Faculty members frequently organize student groups to attend cultural events, such as foreign language plays, concerts, and art exhibits in New York City.

Study Abroad Opportunities

Students are encouraged to participate in study abroad programs organized by the College or other institutions. Many programs are available to interested students. For additional information inquire in the department office (NA 5/223), consult the department website, or visit the CCNY Study Abroad Office (NA 5/216).

Awards

The department awards a variety of prizes each year:

The Charles E. Downer Memorial Fund Scholarship for a Summer of Study Abroad

For outstanding majors in French or Spanish.

The Charles E. Downer Undergraduate Award

For majors and minors who have done exceptional work in an elective course (30000 level or above); all languages.

The Ellen and Joseph Valenti Fellowship for Study Abroad

For an outstanding Spanish major.

Charles G. Habermann Memorial Award in Latin

For excellence in Latin.

The Italian Teachers Association Medal

For an outstanding student of Latin.

The Ward Medals

For outstanding graduating majors in French, Italian, and Spanish.

Alberto Traldi Memorial Fund

For an outstanding student of Italian.

Ángel Estévez Tuition Grant

Elizabeth Starcevic Study Abroad Award

Isaías Lerner Memorial Award

Ephraim Cross Prize

Luisa Eneida Antonia Ruiz Vásquez Award

Michael and Irene Ross Scholars in Hebrew

Spanish Course Sequences for Heritage and Non-Heritage Spanish Speakers

Heritage students courses sequence:

Heritage speakers of Spanish will take the following sequence:

SPAN 19300	Spanish for Heritage Speakers and Listeners I	3
SPAN 19400	Spanish for Heritage Speakers and Listeners II	3

Non-heritage students courses sequence:

Non-heritage speakers will take

SPAN 12300	Introductory Spanish I	3
SPAN 12400	Introductory Spanish II	3
SPAN 22600	Intermediate Spanish	3

Advanced Language Courses (both heritage and non-heritage speakers)

Advanced Spanish Courses

After completing the basic language sequence, students who wish to continue Spanish language study may take one or more of the following courses:

SPAN 32100	Problems of Spanish Grammar	3
SPAN 32200	Practice in Writing Spanish	3
SPAN 32400	Translation	3

Note: SPAN 32100 and SPAN 32200 are required for Spanish majors and minors.

Romance Languages, Bachelor of Arts (B.A.)

Requirements for Majors

Before taking courses for the majors, minors, and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare majors, minors and/or concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which is/are numbered either 123, 124 and 226; 121, 122 and 225; 121, 122, 252, and 253; 121, 122, 223, and 224; 191 and 192; and/or 193 and 194.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

Romance Languages majors are required to maintain a major GPA of 2.0 or higher. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.0 and above to graduate with a BA in Romance Languages.

Students majoring in languages must complete courses in both areas (A and B). Courses are divided as follows:

Group A: Language

Group B: Literature

Concentration in French

Students must complete 36 credits of advanced courses (300-level and 400-level). A minimum of 27 credits must be taken from the list below. A total of 9 credits from relevant courses in other disciplines may be considered to count towards the major subject to approval from an adviser in the French program. Credits acquired as part of summer or semester-long study abroad in francophone countries may also be considered to count toward the major. The prerequisite for all 300-level French courses is French 22600, four years of high school preparation, or placement by examination.

300-Level Courses

FREN 30000	Focus on French Grammar	3
FREN 30400	Focus on Written Expression	3
FREN 30500	Focus on Oral Expression	3
FREN 30600	Focus on Reading	3

400-Level Courses

FREN 40100	France in the World: Monarchy and Revolution	3
FREN 40200	France in the World: The Modern Age	3
FREN 40300	France in the World: Contemporary Experiences	3
FREN 40400	France in the World: Empire, Colonies, Post-colonialism	3
FREN 40500	French and Francophone Cinema	3
FREN 40600	Theories and Histories of Literature	3
FREN 31001	Independent Study	1
FREN 31002	Independent Study	2
FREN 31003	Independent Study	3
FREN 31100-32000	Selected Topics	variable cr., 1-3

Subtotal: 36

Concentration in Italian or Spanish

Students majoring in Italian or Spanish must complete courses in both areas (A and B). Courses are divided as follows:

Group A: Language

Group B: Literature

Required Courses

Three courses from Group A	9
Five courses from Group B	15

Elective Courses

Four additional courses from either A or B	12
--------------------------------------------	----

Subtotal: 36

Concentration in Spanish

Required Courses

SPAN 32100	Problems of Spanish Grammar	3
SPAN 32200	Practice in Writing Spanish	3

Elective Courses

Three of the following courses (at least one from each cluster) (9 credits)

Cluster 1

SPAN 35100	Studies in Spanish Literature I	3
SPAN 35200	Studies in Spanish Literature II	3
SPAN 45100	Spanish Civilization	3

Cluster 2		
SPAN 35300	Studies in Spanish American Literature	3
SPAN 45201	Topics in Spanish American Civilization I	3
SPAN 45202	Topics in Spanish American Civilization II	3

Seven additional courses in language or literature (21)

And One course from the following list:

SPAN 31100-32000	Selected Topics	1-3
SPAN 32500	Spanish Phonetics and Phonology	3
SPAN 32700	Introduction to Spanish Linguistics	3
SPAN 37000	History of the Spanish Language	3
SPAN 46200	Spanish Dialectology and Sociolinguistics	3
SPAN 46301	Spanish in Contact Worldwide	3
SPAN 46302	Spanish in Contact in the US	3

And Electives:

Six additional courses at the 300 or 400 level

Subtotal: 36

Concentration in Spanish Linguistics

SPAN 31100-32000	Selected Topics	1-3
SPAN 32100	Problems of Spanish Grammar	3
SPAN 32200	Practice in Writing Spanish	3
SPAN 32500	Spanish Phonetics and Phonology	3
SPAN 32700	Introduction to Spanish Linguistics	3
SPAN 37000	History of the Spanish Language	3
SPAN 37300	Advanced Spanish Composition & Conversation	3
SPAN 46200	Spanish Dialectology and Sociolinguistics	3

One of the following: (3 credits)

SPAN 32401	Studies in Translation I	3
SPAN 32402	Studies in Translation II	3

One of the following: (3 credits)

SPAN 46301	Spanish in Contact Worldwide	3
SPAN 46302	Spanish in Contact in the US	3

One of the following: (3 credits)

SPAN 35100	Studies in Spanish Literature I	3
SPAN 35200	Studies in Spanish Literature II	3
SPAN 45100	Spanish Civilization	3

One of the following: (3 credits)

SPAN 35300	Studies in Spanish American Literature	3
SPAN 45201	Topics in Spanish American Civilization I	3
SPAN 45202	Topics in Spanish American Civilization II	3

Subtotal: 36

Teaching Spanish in Secondary Schools

Major requirements are listed below. Pedagogical requirements are listed in the Department of Secondary Education (p. 245) section of this Bulletin.

Required Courses

SPAN 32100	Problems of Spanish Grammar	3
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SPAN 32200	Practice in Writing Spanish	3
SPAN 32700	Introduction to Spanish Linguistics	3
SPAN 37300	Advanced Spanish Composition & Conversation	3
SPAN 37400	Lit For Young Adults	3
SPAN 45400	Latino Culture and Literature in the U.S.	3

One of the following three courses: (3 credits)

SPAN 35100	Studies in Spanish Literature I	3
SPAN 35200	Studies in Spanish Literature II	3
SPAN 45100	Spanish Civilization	3

Two of the following three courses: (6 credits)

SPAN 35300	Studies in Spanish American Literature	3
SPAN 45201	Topics in Spanish American Civilization I	3
SPAN 45202	Topics in Spanish American Civilization II	3

Three additional Spanish courses at the 300 or 400 level (9 credits)

SPAN 32500: Spanish Phonetics and Phonology is HIGHLY recommended.

Subtotal: 36

Concentration in Two Romance Languages

A student concentrating in two Romance languages will be required to complete a minimum of twelve advanced courses, including a minimum of six in each language. Among the six advanced courses chosen in each language, two must be from Group A and two must be from Group B. The remaining two courses may be selected from either group A or B.

Students concentrating in two languages will be required to have two specialization advisors, one from each language area. With guidance from their advisors, students will choose those courses that are most pertinent to their backgrounds and objectives.

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Curriculum for Minors in French, Italian, Spanish, Spanish Linguistics, and Classical Studies

Before taking courses for the minors and concentrations in the Classical and Modern Languages and Literatures Department (CMLL), students who declare or intend to declare minors and/or concentrations in CMLL must complete the appropriate Foundational Language Sequence(s), which is/are numbered either 123, 124 and 226; 121, 122 and 225; 121, 122, 252, and 253; 121, 122, 223, and 224; 191 and 192; and/or 193 and 194.

Students with demonstrated language proficiency may be exempted from some or all Foundational Language Sequence Courses (but without receiving credit for them). See department for proper placement.

All minors must be approved by the Chair of the Department of Classical and Modern Languages and Literatures.

Arabic Minor

(15 credits)

The prerequisite for a minor in Arabic Language and Cultures is Arabic ARAB 226 or placement by examination.

I. Required Courses

There are **THREE** required courses for the minor (9 credits).

ARAB 30000	Advanced Intermediate Arabic	3
ARAB 30100	Selected Topics in Arabic Literatures and Cultures	3

One course from the following:

ARAB 40100	Modern Arabic Literatures	3
ART 21052	Islamic Art	3
CL 31100-32000	Selected Topics in Comparative Literature	3
FREN 40400	France in the World: Empire, Colonies, Post-colonialism	3

II. Elective Courses

Possible courses include the following:

ANTH 32300	Islamic Cultures and Issues	3
ANTH 24600	Peoples of the Middle East	3
ART 27000	Projects in Ceramic Design	3
ART 21052	Islamic Art	3
CL 31100-32000	Selected Topics in Comparative Literature	3
CL 41100-42000	Seminars in Comparative Literature	3
FREN 40500	French and Francophone Cinema	3
HIST 42900	Minorities in Modern Europe	3
HIST 34401		
HIST 48400	Modern Middle East	3
HIST 48500	Women and Gender in the Middle East	3
HIST 48600	Arab-Israeli Conflict	3
HIST 48700	Islamic Polit Mvmt	3
JWST 21100	Contemporary Israel	3
AES 23202	Survey of World Architecture I	3
AES 24202	Survey of World Architecture II	3

Courses are subject to approval by advisor.

French or Italian Minor

(15 credits)

A student minoring in French or Italian will be required to take any five-course combination (Group A or B) at the advanced level (30000 or above).

Portuguese Language and Lusophone Cultures Minor

(15 credits)

The **prerequisite** for a minor in Portuguese Language and Lusophone Cultures is Portuguese PORT 226 or its equivalent.

A. Required Courses (9 credits):

There are **THREE** required courses for the minor, distributed as follows:

Students must take **BOTH** courses in **GROUP A**:

GROUP A:

PORT 32100	Reading and Writing in Portuguese	3
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This required course lays the foundations for students' further understanding of grammar and different forms of expository and analytical writings in Portuguese. The short stories studied in this course address topics such as the representation of national self-identity, slavery, the indigenous, Afro-Brazilian and immigrant cultures, the Lusophone diaspora, gender, and regional differences encountered throughout Portuguese speaking countries. Readings and class discussions in Portuguese. Prerequisite: PORT 22600 or scoring at the exempt level. 3hr./wk.; 3 cr.

and

PORT 32200	Reading and Speaking in Portuguese II	3
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While PORT 32100 focuses on language acquisition and writing, PORT 32200 provides intense practice of the spoken language, through comprehension of Lusophone texts, films and current events. Prerequisite: PORT 22600 or scoring at the exempt level. Co-requisite: PORT 32100. 3hr./wk.; 3 cr.

Additionally, they must take ONE course from GROUP B:

GROUP B:

PORT 40100	Selected Topics in Luso-Brazilian Literatures and Cultures	3
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An overview of the development of Luso-Brazilian literature since its origins to contemporary times. This course will include a study of the social, cultural and political developments of Brazil and Portugal. Students will study the contribution of Native, Iberian and African cultures, the development of the arts, the impact of revolutionary movements and the place of minorities today. Prerequisites: PORT 32100 and PORT 32200. 3hr./wk.; 3 cr.

or

PORT 40200	The Cultures and Literatures of Lusophone Africa	3
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A survey of the post-colonial literature of Lusophone Africa. Topics include the struggle for independence, geography, folklore, the development of the arts, ideology, socio-political changes and social issues. Prerequisites: PORT 32100 and PORT 32200. 3hr./wk.; 3 cr.

B. Elective Courses (6 credits):

Students must take **TWO additional courses (6 credits)** in disciplines which incorporate into their curriculum the cultures of Brazil, Portugal and/or Lusophone Africa. Students have the option to choose TWO elective courses from the following departments, as they may suit their major field of study and personal interest:

Foreign Languages and Literatures, Comparative Literature, Architecture, Art History, Anthropology, Media and Communications, Sociology, Music, International Studies, Political Science, Black Studies, Latin American and Latino Studies or Economics. **All courses are subject to approval by the advisor for Portuguese.**

Spanish Minor

(15 credits)

The minor in Spanish consists of 5 advanced courses at the 30000 and 40000 levels, distributed in the following manner:

A student minoring in Spanish is required to take

SPAN 32100	Problems of Spanish Grammar	3
SPAN 32200	Practice in Writing Spanish	3

one survey course

SPAN 35100	Studies in Spanish Literature I	3
SPAN 35200	Studies in Spanish Literature II	3
	OR	
SPAN 35300	Studies in Spanish American Literature	3

one course in civilization and culture

SPAN 45100	Spanish Civilization	3
SPAN 45201	Topics in Spanish American Civilization I	3
	OR	
SPAN 45202	Topics in Spanish American Civilization II	3

and one course to be chosen from Group B (Literature) at the 4000 level.

Spanish Linguistics Minor

Required Courses

A student minoring in Spanish Linguistics is required to take

SPAN 32100	Problems of Spanish Grammar	3
SPAN 32200	Practice in Writing Spanish	3

And any three courses from the following:

SPAN 32500	Spanish Phonetics and Phonology	3
SPAN 32700	Introduction to Spanish Linguistics	3
SPAN 37000	History of the Spanish Language	3
SPAN 46200	Spanish Dialectology and Sociolinguistics	3
SPAN 46301	Spanish in Contact Worldwide	3
SPAN 46302	Spanish in Contact in the US	3

Classical Studies Minor

Students minoring in Classical Studies must take a minimum of 12 credits.

These will include some combination of (a) courses at the 2000 level or above in which readings are in English, and (b) Greek and Latin courses beyond the first semester of instruction (LAT 12200 and above, GRK 12200 and above).

In addition to Greek and Latin classes, students are encouraged to select from the following courses.

Consult the corresponding department section of this Bulletin for full course descriptions.

ART 27000	Projects in Ceramic Design	3
ART 27100	Greek And Roman Art	3
CLSS 32100	Classical Mythology	3
CLSS 32300	Greek and Roman Comedy and Satire in Translation	3
CLSS 33100	Latin Literature in Translation	3
CLSS 40100	Modern Problems in Perspective	3
HIST 32100	Early America: From Settlement to the Great Awakening	3
HIST 32200	The Era of the American Revolution	3
PHIL 30500	History of Philosophy I: Ancient	3
PSC 27300	Political Systems of Asia	3

Other courses dealing with the Greco-Roman world may be substituted with permission.

Faculty

Maxime Blanchard, Associate Professor
B.A., Univ. de Montreal; M.A. Univ. of Minnesota; D.E.A., Univ. de Paris-IV (Sorbonne); Ph.D., Harvard

Silvia Burunat, Professor
B.A., M.A., Boston University; Ph.D., City University of New York

Richard F. Calichman, Professor
B.A., Colby College; M.A., Ph.D., Cornell University

Regina Castro McGowan, Lecturer
B.A., City College of New York; Ph.D., City University of New York

Raquel Chang-Rodríguez, Distinguished Professor
B.S., Montana State University; M.A., Ohio University; Ph.D., New York University

Elazar Elhanan, Assistant Professor
B.A., Tel Aviv University; Ph.D., Columbia University

Isabel Estrada, Assistant Professor

B.A., University of Seville; Ph.D. Columbia University

Angel Luis Estévez, Associate Professor
B.A., Hunter College; Ph.D., City University of New York

Dulce M. García, Associate Professor
B.A., Barry University; M.S., Ph.D., Georgetown University

Amr Kamal, Assistant Professor
B.A., University of California at Irvine; Ph.D. Michigan University

Amy Kratka, Lecturer
B.A., Queens College; M.A., Ph.D., Boston University

Edwin M. Lamboy, Associate Professor (Courtesy Appointment)
B.A., Universidad de Puerto Rico (Río Piedras); M.Ed., Lehman College; Ph.D., The Pennsylvania State Univ.

Bettina Lerner, Assistant Professor
B.A., Ph.D., Yale University

Jaime Manrique, Distinguished Lecturer
B.A., University of South Florida

Juan Carlos Mercado, Professor
B.A., Univ. del Comahue (Argentina); M.A., Queens College; Ph.D., City University of New York

Corinna Messina-Kociuba, Lecturer
B.A., S. Pio V Univ. of Rome; M.A., City College of New York

Roy Mittelman, Lecturer
B.A., University of Pennsylvania; M.A., Ph.D., Temple University

Devid Paolini, Assistant Professor
B.A., M.A., University of Bologna; Ph.D., City University of New York

Carlos Riobó, Associate Professor and Chair
B.A., Columbia University; M.A., Ph.D., Yale University

Jennifer Roberts, Professor
B.A. Yale College; M.A., Ph.D., Yale University

Nelly D. Saint-Maurice, Lecturer
B.T.S., CNAM, Paris; B.F.A., M.A., City College of New York; M.Phil., City University of New York

Daniel Shapiro, Distinguished Lecturer
B.A. San Diego State University; M.F.A, Creative Writing, University of Montana, Missoula

Mary Ruth Strzeszewski, Associate Professor
B.A., M.A., Ph.D., Columbia University

Araceli Tinajero, Professor
B.A., M.A., Ph.D., Rutgers University

Vanessa K. Valdés, Associate Professor
B.A., Yale University; M.A., Ph.D., Vanderbilt University

I-Hsien Wu, Assistant Professor
B.A., Boston University; M.A., Ph.D., Columbia University

Professors Emeriti

Gisele Corbière-Gille

Laura Callahan

Stephen G. Daitz

Gabriella de Beer

Antonio R. de la Campa

Manuel de la Nuez

Adriana Garcia-Davila

Françoise Dorenlot

Janette Gatty

Marshall S. Hurwitz

Theodore Litman
 Antonio Sacoto
 Eve Sourian
 Elizabeth Starčević
 Zvi Henri Szubin
 Renée Waldinger
 Sharifa M. Zawawi
 Jacques Zéphir

Community Change Studies Program

(The Colin Powell School for Civic and Global Leadership, formerly the Division of Social Science)

Professor John Krinsky • Program Office: NA 4/163 • Tel: 212-650-5236

Programs and Objectives

New York City is a place of great diversity and adversity. Grassroots organizations have been at the forefront of many of struggles to address this adversity in areas from unequal education, racial discrimination, workplace abuses and low pay, gender-based violence, and a housing crisis that has become more acute than ever. Many of these groups, however, face a shortage of skilled staff members with backgrounds in organizing and advocacy; moreover, their leadership and key staff members often lack an organic relationship to the neighborhoods and constituencies they organize. The Minor in Community Change Studies will connect students with existing organizations in specially designed classes and internships that help to prepare them for social advocacy and organizing jobs as well as continuing post-graduate education in related fields.

Community Change Studies Minor

Required Courses

The minor requires six courses for a total of 19 credits as described below.

PSC 31147	Community Organizing	3
PSC 31051	Community-Based Research	3
SSC 31200	Internship	3
SSC 31201	Community Change Studies Internship Recitation	1

Three courses from the following list.

Political Science

PSC 12500	Introduction to Public Policy	3
PSC 20700	The Politics of Criminal and Civil Justice	3
PSC 21000	Urban Politics	3
PSC 21600	Political Parties and Interest Groups	3
PSC 21700	Mass Media and Politics	3
PSC 31507	The Politics of Immigration	3
PSC 37600	Marxism	3
PSC 32400	The Politics of Protest	3

Psychology

Anthropology

ANTH 20100	Cross-Cultural Perspectives	3
ANTH 22500	Class, Ethnicity and Gender	3
ANTH 23100	Anthropology of Law	3
ANTH 25400	American Cultural Patterns	3
ANTH 25500	Anthropology of Health and Healing	3

ANTH 35000	Race and Racism	3
ANTH 26500	Language and Society	3

Economics and Business

ECO 31150	Developing Management Skills	3
ECO 31750	Economics Environmental Entrepreneurship	3
ECO 31950	Leadership	3
ECO 33350	Macroeconomics II	3
ECO 33650	Public Finance	3
ECO 33850	Public Economics	3
ECO 41350	Business and Society	3
ECO 43450	Public Investment Analysis	3

Sociology

SOC 24100	Criminology and Corrections	3
SOC 24200	Juvenile Delinquency	3
SOC 24300	Sociology of Youth	3
SOC 24500	Sociology of Social Welfare Institutions	3
SOC 25100	Urban Sociology	3
SOC 25200	Social Class	3
SOC 25400	Social Problems	3
SOC 26000	Theory of Social Change	3
SOC 26300	Contemporary Social Issues	3
SOC 26700	Social Change in Developing Countries	3
SOC 26800	Studies in Social Forces and Mass Movements	3
SOC 29000	Immigration	3
SOC 38101	Contemporary Issues in the Workplace	3
SOC 38107	Justice, Law, and Society	3

Comparative Literature Program

(Division of Humanities and the Arts)

Professor Bettina Lerner, Director • Program Office: NAC 6/320A • Tel: 212-650-7935

General Information

The City College offers the following undergraduate degree in Comparative Literature:

B.A. in Comparative Literature (p. 182)

Programs and Objectives

The Comparative Literature program offers students an opportunity to study literature from a broader, more comprehensive point of view than one restricted to the works of a single nation or a single language area.

The B.A. program is designed to make the student aware of the international culture in which national literatures flourish. The student will study the ways in which the literatures of different nations enrich, influence, and help define each other, in order to be able to recognize those traits that are universally shared and those that are distinctive and unique to each one.

The program in Comparative Literature also gives the student the opportunity to enhance his or her competence in a foreign language through the study of literature.

Each student majoring in Comparative Literature will design his or her own program in consultation with one of the faculty advisors, whose approval of the program is required. The choice of electives will reflect the student's background, special interests, and objectives.

Students should review course offerings in the departments or programs of Classical and Modern Languages and Literatures, English, Asian

Studies, Black Studies, Jewish Studies, Latin American and Hispanic Caribbean Studies, and Women's Studies.

The possibilities for interdisciplinary study are numerous. Students may, for example, choose to orient their study of the national literatures to such topics as literature and science, literature and society, or literature and other arts, and may include in their programs related courses in such fields as anthropology, art, history, music and theatre.

Comparative Literature, Bachelor of Arts (B.A.)

Requirements for Majors

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.0 and above to graduate with a BA in Comparative Literature.

Students majoring in Comparative Literature must complete the following:

Required Courses

CL 28000	Introduction to Comparative Literature	3
CL 41100-42000	Seminars in Comparative Literature	3

Elective Courses

National literatures in the original language:		
	Courses in the first language minimum	15
	Courses in a second language minimum	6
	Related free electives	9

Subtotal: 36

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Advisement

Students interested in Comparative Literature should consult with the Director, Professor Bettina Lerner, who will assist them in identifying a faculty advisor.

Majors in the Department of Comparative Literature are expected to maintain a minimum GPA of 2.5. Those who fall below that number will be called in for a conference with a departmental advisor to discuss ways of improving academic performance. The advisor may recommend taking a particular course for better preparation, meeting with a tutor in the Writing Center, taking a course load lower than 15 credits, or other strategies for achieving academic success. All students should try to maintain the highest possible GPA in order to enhance their prospects for acceptance to graduate programs and career opportunities.

Faculty

The faculty of the program includes those professors who teach the program's courses and those whose departmental courses may be credited to the major.

Department of Earth and Atmospheric Sciences

(Division of Science)

Professor Kyle McDonald, Chair • Department Office: MR 926 • Tel: 212-650-6984

General Information

The City College offers the following undergraduate degree in Earth and Atmospheric Sciences:

B.S. in Geology (p. 183)

B.S. in Environmental Earth Systems Science (p. 191) (please refer to the Environmental Earth Systems Science section (p. 191) of this Bulletin)

B.A. in Geology

Programs and Objectives

The Department of Earth and Atmospheric Sciences offers a unique version of the Earth System Science (ESS) model, the proposed national curriculum for the earth sciences. The ESS approach has been adopted by NASA and other government agencies as the appropriate method for understanding and modeling the complexities of the world system. By understanding the relationships that sustain the earth's oceans and atmosphere we can better develop methods for phrasing and solving environmental problems. EAS/ESS emphasizes a curriculum that deals with the geochemical and geophysical relationships that produce an environmentally sound and self-perpetuating world.

This new approach attempts to be as multi-disciplinary as possible, allowing students to choose electives from other science departments and from engineering. The special strengths of the department include hydrology/subsurface remediation, geophysics and environmental geophysics, meteorology and remote sensing, and environmental geochemistry. Students graduating from EAS with the system science training are especially able to include geological/GIS mapping and remote sensing in their portfolio of skills. These and related skills are especially valuable to engineering geology companies, government agencies, such as NASA and NOAA, and a multitude of areas that involve spatial planning. By careful selection of electives students can be equally well prepared for careers ranging from Classical Geology to Environmental Public Policy, and Terrestrial Ecology. Majors are also ideally prepared to pursue careers in education and advanced degrees in the Earth Sciences.

Departmental Facilities

The EAS Department maintains well-equipped hydrology, geochemistry, geophysics, remote sensing, and cryospheric processes laboratories. Geochemical equipment includes a Phillips x-ray fluorescence station, a Thermo X-series2 ICP-MS, and Thermo flame and graphite furnace atomic absorption facilities. A Thermo Finnigan Trace DSQ Gas Chromatograph/Mass Spectrometry system with chemical ionization and autosampler, a Glas-Col Soxhlet extraction system, Dionex Summit HPLC with gradient pump and UV detector, a Kodak Image Station 2000MM Multi-Modal high performance digital imaging system and related equipment are available for contaminant hydrology. The High Pressure Laboratory includes a 0-100,000 PSI Harwood intensifier, a Honeywell temperature-regulating system, and a petrographic microscope laboratory. Additional equipment includes access to a Panalytical X'Pert Pro X-ray diffractometer, a ZEISS Supra 55VP SEM-EDS, and a JEOL 2100 High Resolution Transmission Electron Microscope. The Geophysics Laboratory is equipped with a 24-channel Strataview engineering seismograph system, an EM-31 electromagnetic ground conductivity meter, a Syscal Kid Switch 24 automated resistivity system, an older Soiltest resistivity meter, a Worden student gravimeter, and a GSM-19T proton precession magnetometer. In remote sensing, field gear supporting ground measurements for validation of remote sensing datasets concerning terrestrial ecosystem dynamics and the carbon and water cycles is available, as well as an HP XW9400 Workstation for analyzing satellite data. Finally, the Cryosphere Processes Laboratory maintains field equipment, including a Draganfly remotely controlled helicopter, Ocean Optics and ASD Fieldspec spectrometers, a Valeport Model 106 Current Meter, a Hobo Water Level Data Logger, instruments for measuring snow properties, and a radiometer, for monitoring the melting of ice sheets.

Research

Qualified students are encouraged to become research assistants to faculty, and must complete a capstone research project as part of the

major requirements sequence. Many are assisted in their research with support from the CCNY National Oceanic and Atmospheric Administration Cooperative for Remote Sensing Science and Technology (CREST) Center and the CUNY-GISS REU: Global Climate Change. Through an exciting research program with the United States Geological Survey (USGS), up to ten students per summer are supported to perform fieldwork under the direct supervision of USGS scientists. Student fieldwork under this program has been carried out from New Jersey to Massachusetts, with new possibilities being created for throughout the United States. Internships are also available in a variety of earth science disciplines with the NASA Jet Propulsion Laboratory in Pasadena, California.

Departmental Activities

CCNY Geology Club

The Geology Club has meetings during club hours. Meetings include guest lectures, environmental films, and field trips in the NYC area.

Society of Exploration Geophysicists (SEG)

A student chapter of this society has recently been formed, with a focus on the use of geophysics for environmental and engineering applications.

American Meteorological Society

The American Meteorological Society is for students interested in meteorology and its applications. Visits to weather stations are scheduled.

Awards

The Ward Medal

Presented each year to outstanding graduating seniors. For detailed information, see the Guide to City College Prizes, Awards, and Medals in the office of the Chair.

Advisement

For general advisement for all program options:

Professor Patricia Kenyon
MR 933; 212-650-6472

Dr. Angelo Lampousis
MR 046; 212-650-7590

Geology, Bachelor of Science or Arts (B.S. or B.A.)

Requirements for Majors

A GPA of 2.0 or higher in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

The EAS Curriculum comprises a basic set of courses (Non-EAS Science and Math Courses and Basic Courses for EAS Majors) complemented by 33 credits of elective courses (Electives for Standard EAS Option). The EAS elective set is extensive and is supplemented by special topics courses offered on subjects of interest to students and faculty. Recent special topics courses have included Environmental Site Assessments, Geothermal Resources, and a course on the environmental applications of the Matlab computer program. Under certain circumstances, selected courses from other departments may also be counted toward the major. This option is limited, however, and is approved on a case-by-case basis. Selections from the set of EAS electives are chosen in consultation with either Dr. Lampousis or Professor Kenyon, to ensure a coherent program.

It is recommended that EAS majors complete PHYS 20700-20800, though the PHYS 20300-20400 sequence may be preferred for some students. MATH 20100-20300 is recommended, but MATH 20500-20900 is an acceptable option for some students. Recommendations are on a case-by-case basis.

Foundational courses for the EAS major must be completed before embarking upon related courses in the major. Students with appropriate

background as demonstrated by the College’s Placement Exam may be exempted from some or all Foundational Courses. The foundational course for Earth Systems Science (EAS 10600) is Pre-Calculus (Math 19500); this course must be passed with a grade of C or higher (or students must place into a higher math course) in order to proceed to the next level.

Standard EAS Option, Leading to a B.S. Degree

All EAS majors in the standard option must complete the Basic Courses for EAS Majors with a grade of at least C in each course and pass 33 credits of courses from the elective list with a C average.

Required Courses (for both Standard EAS and Secondary Education options):

Required Non-EAS Science and Math Courses

Normal Sequence (for most students): (26 credits)

MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
PHYS 20700	University Physics I	4
PHYS 20800	University Physics II	4

Alternative Sequence (for geobiology): (24 credits)

MATH 20500	Elements of Calculus	4
MATH 20900	Elements of Calculus and Statistics	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
PHYS 20300	General Physics I	4
PHYS 20400	General Physics II	4

Basic EAS Courses: (22 credits)

EAS 10600	Earth Systems Science	4
EAS 21700	Systems Analysis of the Earth	4
EAS 22700	Structural Geology	4
EAS 30800	ESS Modeling/Databases	3
EAS 41300	Environmental Geochemistry	3
EAS 472**	Environmental Project	4-6

EAS 10600: ENGR 10610 also accepted

EAS Electives for Standard EAS Option

Choose 33 credits from the elective list below

EAS 30000	Earth and Environmental Science Seminar	1
EAS 301**-304**	Honors I-IV	Variable cr.
EAS 30900	Fundamentals of Atmospheric Science	3
EAS 310**	Independent Study	1-4
EAS 311**-315**	Selected Topics in Earth Systems Science	3-4
EAS 32800	Global Environmental Hazards	3
EAS 33000	Geographic Information Systems	3
EAS 33300	Phase I Environmental Site Assessments	3
EAS 33400	Phase II Environmental Site Assessments	3
EAS 34500	Hydrology	3
EAS 36500	Coast and Ocean Processes	3
EAS 41700	Satellite Meteorology	3
EAS 42600	Environmental Remote Sensing and Image Analysis	3
EAS 42700	Remote Sensing of the Ocean	3
EAS 43000	Sedimentology	3
EAS 43900	Mineral/Energy Resources	4

EAS 44600	Groundwater Hydrology	3
EAS 44800	Terrestrial, Aquatic and Atmospheric Systems	4
EAS 45000	Environmental Field Methods	3
EAS 48800	Climate Change	3
EAS 52800	Plate Tectonics/Geodynamics	3
EAS 56100	Geophysics	3
EAS 56500	Environmental Geophysics	3
EAS 56600	Solid Earth Geochemistry	3

Up to 9 credits of the 33 credits of electives may come from the non-EAS courses below:

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
CHEM 26100	Organic Chemistry I	3
CHEM 26200	Organic Chemistry Laboratory I	2
CHEM 26300	Organic Chemistry II	3
CSC 10200	Introduction for Computing	3
ENGR 30100	Introduction to Satellite Remote Sensing and Imaging	3
ENGR 59910	Introduction to GIS	3
MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
MATH 37500	Elements of Probability Theory	4
MATH 37600	Mathematical Statistics	4
MATH 37700	Applied Statistics and Probability	3

Requirements for a B.A. in EAS

B.A. Science Core	9
Required EAS Courses	22
EAS Electives	33

Subtotal: 55

Additional Requirements

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements (Pathways) (p. 286) section of the Bulletin for more information. Earth and Atmospheric Science students will satisfy their "Pathways" requirements most efficiently by following these recommendations:

Fixed Core

English Composition I:

FIQWS	Freshman Inquiry Writing Seminar	6
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English Composition II:

ENGL 21003	Writing for the Sciences	3
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Mathematical and Quantitative Reasoning:

MATH 20100	Calculus I	3
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Life and Physical Sciences:

CHEM 10301	General Chemistry I	4
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Flexible Core

World Cultures and Global Issues:

any CLAS offerings in this category

Individual and Society:

any CLAS offerings in this category

U.S. Experience in its Diversity:

any CLAS offerings in this category

Creative Expression:

any CLAS offerings in this category

Scientific World:

PHYS 20700

Additional course in Scientific World:

CHEM 10401	General Chemistry II	4
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College Option

Speech

SPCH 11100	Foundations of Speech Communication	3
	OR	

SPCH 00380

or exemption on the basis of demonstrated proficiency

Foreign Language

Two semesters of college-level study, or exemption on the basis of two years of high-school level study, or demonstrated proficiency.

Philosophy

Any approved CLAS offerings in this category.

Secondary Education Concentration in Earth and Atmospheric Sciences

Major Requirements

Students must also take one of the sequences of required non-EAS science and math courses listed below. Pedagogical requirements are listed in the Department of Education (p. 286) section of this Bulletin.

Basic Earth Science Courses: (7 credits)

EAS 10600	Earth Systems Science	4
ASTR 30500	Methods in Astronomy	3

Required EAS Courses: (18 credits)

EAS 21700	Systems Analysis of the Earth	4
EAS 22700	Structural Geology	4
EAS 30800	ESS Modeling/Databases	3
EAS 41300	Environmental Geochemistry	3
EAS 472**	Environmental Project	4-6

Alternative Sequence (for geobiology or secondary education): (24 credits)

MATH 20500	Elements of Calculus	4
MATH 20900	Elements of Calculus and Statistics	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
PHYS 20300	General Physics I	4
PHYS 20400	General Physics II	4

EAS Electives:

Choose 9 credits from the elective list below. Also, see pedagogical courses required by the School of Education.

EAS 30900	Fundamentals of Atmospheric Science	3
EAS 311**-315**	Selected Topics in Earth Systems Science	3-4
EAS 32800	Global Environmental Hazards	3
EAS 33000	Geographic Information Systems	3
EAS 33300	Phase I Environmental Site Assessments	3
EAS 33400	Phase II Environmental Site Assessments	3
EAS 34500	Hydrology	3
EAS 36500	Coast and Ocean Processes	3

EAS 41700	Satellite Meteorology	3
EAS 42600	Environmental Remote Sensing and Image Analysis	3
EAS 42700	Remote Sensing of the Ocean	3
EAS 43000	Sedimentology	3
EAS 43900	Mineral/Energy Resources	4
EAS 44600	Groundwater Hydrology	3
EAS 44800	Terrestrial, Aquatic and Atmospheric Systems	4
EAS 45000	Environmental Field Methods	3
EAS 48800	Climate Change	3
EAS 52800	Plate Tectonics/Geodynamics	3
EAS 56100	Geophysics	3
EAS 56500	Environmental Geophysics	3
EAS 56600	Solid Earth Geochemistry	3

EAS 30000: 2 credits max.

Subtotal: 34

Additional Requirements

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements (Pathways) (p. 286) section of the Bulletin for more information. Earth and Atmospheric Science students will satisfy their "Pathways" requirements most efficiently by following these recommendations:

Fixed Core

English Composition I:

FIQWS Freshman Inquiry Writing Seminar 6

English Composition II:

ENGL 21003 Writing for the Sciences 3

Mathematical and Quantitative Reasoning:

MATH 20100 Calculus I 3

Life and Physical Sciences:

CHEM 10301 General Chemistry I 4

Flexible Core

World Cultures and Global Issues:

any CLAS offerings in this category

Individual and Society:

any CLAS offerings in this category

U.S. Experience in its Diversity:

any CLAS offerings in this category

Creative Expression:

any CLAS offerings in this category

Scientific World:

PHYS 20700

Additional course in Scientific World:

CHEM 10401 General Chemistry II 4

College Option

Speech

SPCH 11100 Foundations of Speech Communication 3
OR

SPCH 00380

or exemption on the basis of demonstrated proficiency

Foreign Language

two semesters of college-level study, or exemption on the basis of two years of high-school level study, or demonstrated proficiency

Philosophy

Any CLAS offerings in this category.

Total Secondary Education Concentration Credits: 34, plus non-EAS science courses listed above.

Earth and Atmospheric Sciences Minor

Requirements for a Minor in EAS

A minor in EAS requires a minimum of 9 credits beyond EAS 10600. These courses are in addition to the science core requirements.

Faculty

Karin Block, Associate Professor
A.B., Univ. of Michigan; M.Phil., CUNY, Ph.D.

Benjamin Black, Assistant Professor
A.B., Harvard University; M.F.A., New York University; Ph.D., Massachusetts Institute of Technology

James Booth, Assistant Professor
B.S., Univ. of North Carolina, Chapel Hill; M.S., Univ. of Kentucky; Ph.D., Univ. of Washington

Patricia Kenyon, Associate Professor
B.S., Rensselaer Polytechnic Inst.; Ph.D., Cornell Univ.

Steven Kidder, Assistant Professor
B.S., Univ. of Minnesota; M.S., Univ. of Arizona; Ph.D., California Inst. of Technology

Angelo Lampousis, Lecturer
B.S. Aristotle University of Thessaloniki (Greece); M.Phil., CUNY, Ph.D.

Z. Johnny Luo, Associate Professor
B.S., Peking Univ. (China); M.Phil., Columbia Univ., Ph.D.

Kyle McDonald, Professor
B.E.E., Georgia Inst. of Technology; M.S., Johns Hopkins Univ.; M.S., Univ. of Michigan, Ph.D.

Maria Tzortziou, Associate Professor
B.S., Aristotle Univ. (Greece), M.Sc.; M.S., Univ. of Maryland, Ph.D.

Zhengrong Wang, Associate Professor
B.S., Univ. of Science and Technology of China, M.S.; Ph.D., California Inst. of Technology

Pengfei Zhang, Professor and Chair
B.S. Univ. of Science and Technology of China; M.S., Montana Tech of the Univ. of Montana; Ph.D., Univ. of Utah

Professor Emeritus

Stanley Gedzelman

Edward Hindman

Margaret Anne Winslow

Department of Economics and Business

(The Colin Powell School for Civic and Global Leadership)

Professor Kevin Foster, Chair • Department Office: NA 4/121 • Tel: 212-650-5403

General Information

The City College offers the following undergraduate and combined degrees:

B.A. in Economics (p. 186)

B.A. in Management and Administration (p. 186)
B.A./M.A. (Combined Degree) in Economics (p. 186)

Programs and Objective

Economists are concerned with the problems that arise in allocating scarce resources to alternative uses. They analyze supply, demand and market conditions both for individual goods and services the public sector, and the economy as a whole. Students prepare for a variety of careers in the business, non-profit, public and academic sectors of society. The study of Economics helps people to make informed decisions as citizens and community leaders and in their private affairs.

The Management and Administration major prepares students to be effective contributors to organizations by developing key managerial abilities critical for success in the contemporary workplace. Students develop their abilities to research and critically analyze business information, make recommendations to solve real-world business problems, and become effective team members and team leaders. The Management and Administration major uses an integrating management framework to develop systems thinking and analysis, problem solving, and interacting and leading as key managerial abilities. This framework enables students to view organizations as complex systems and to make decisions that recognize the diverse needs of multiple stakeholders.

Economics, Bachelor of Arts/Master of Arts (B.A./M.A.)

The B.A./M.A. program is an intensive program that affords academically gifted undergraduate students the opportunity to obtain an M.A. degree along with a B.A. degree. To be admitted into the BA/MA, the prospective student needs to have taken at least 30 credits with an overall GPA of 3.0 or higher. Students need grades of B+ or higher in ECO 10250, ECO 10350, ECO 20150, ECO 20250, and ECO 20350 or equivalent courses. A student combines the BA and MA degrees by: completing 8 required courses for the undergraduate Economics major (calculus plus ECO 10150, ECO 10250, ECO 10350, ECO 20150, ECO 20250, ECO 20350, and ECO 20450), then fulfilling the MA requirements as noted in the Graduate Bulletin. The 6 upper-level undergraduate courses are substituted by MA courses.

Additional Requirements

At least a 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from all courses for the major, including Calculus, that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. Courses must have a grade of C- or better to fulfill the requirements of the major. A D grade is inadequate. In addition to college requirements for residency, at least two of the four "Major Core" and three of the four "Field" courses must be completed at CCNY.

Majors must place into calculus (MATH 20100 or MATH 20500 or higher) or may be required to complete the prerequisite sequence through MATH 19500.

Economics, Bachelor of Arts (B.A.)

Required Courses

Required courses in Economics

ECO 10150	Principles of Management	3
ECO 10250	Principles of Microeconomics	3
ECO 10350	Principles of Macroeconomics	3
ECO 20150	Principles of Statistics	4
ECO 20250	Intermediate Microeconomics	3
ECO 20350	Intermediate Macroeconomics	3
ECO 20450	Principles of Accounting I	3
ECO 33150	Introduction to Econometrics	4

Three of the following from a single field, one of which must be a capstone (8-9 credits)

Field courses in Economics

ECO 21850	Managerial Economics	3
ECO 23150	Environmental Economics and	3

ECO 23250	Sustainability Energy, Commodities, and the Environment	2
ECO 23350	Economic History	3
ECO 23450	Law and Economics	3
ECO 25550		
ECO 32150	International Finance	3
ECO 32250	Money and Banking	3
ECO 33350	Macroeconomics II	3
ECO 33550	Urban Economics	3
ECO 33650	Public Finance	3
ECO 33750	Transportation Econ	3
ECO 43350	Labor Economics	3
ECO 43550	Econometrics 2	3
ECO 33450	International Trade	3
ECO 43150	Industrial Organization	3
ECO 43250	Economic Development	3
ECO 43450	Public Investment Analysis	3
ECO 49150	Honors Thesis I	Variable cr.
ECO 49250	Honors Thesis II	Variable cr.

ECO 33450, ECO 43150, ECO 43250, ECO 43450, ECO 49150, ECO 49250: Capstone

Two major electives (6 credits)

One of the following (3-4 credits)

MATH 20100	Calculus I	3
	OR	
MATH 20500	Elements of Calculus	4

ECO 10400 can substitute for ECO 10250 and ECO 10350. ECO 19150 can substitute for ECO 10250 and ECO 10350.

Subtotal: 43-44

Additional Requirements

At least a 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from all courses for the major, including Calculus, that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. Courses must have a grade of C- or better to fulfill the requirements of the major. A D grade is inadequate. In addition to college requirements for residency, at least two of the four "Major Core" and three of the four "Field" courses must be completed at CCNY.

Majors must place into calculus (MATH 20100 or MATH 20500 or higher) or may be required to complete the prerequisite sequence through MATH 19500.

Management and Administration, Bachelor of Arts (B.A.)

Required Courses

Economics:

ECO 10150	Principles of Management	3
ECO 10250	Principles of Microeconomics	3
ECO 10350	Principles of Macroeconomics	3
ECO 20150	Principles of Statistics	4
ECO 20250	Intermediate Microeconomics	3
ECO 20350	Intermediate Macroeconomics	3
ECO 20450	Principles of Accounting I	3

Four Field courses in Management and Administration from this list, one of which must be a capstone (denoted Cap) (12 credits)

ECO 21150	Consumer Behavior	3
ECO 21250	Principles of Marketing	3
ECO 21350	International Environment of Business	3
ECO 21450	Business Law	3

ECO 22250	Corporate Finance	3
ECO 31250	Human Resource Management	3
ECO 31150	Developing Management Skills	3
ECO 31350	Operations and Production	3
ECO 31450	Business Law II	3
ECO 31550	Marketing Research	3
ECO 31650	Organizational Behavior	3
ECO 31750	Economics Environmental Entrepreneurship	3
ECO 31850	Managerial Economics	3
ECO 31950	Leadership	3
ECO 32350	Accounting II	3
ECO 41250	Entrepreneurship	3
ECO 41150	Strategic Management	3
ECO 41350	Business and Society	3
ECO 41450	Information and Technology Management	3
ECO 49150	Honors Thesis I	Variable cr.
ECO 49250	Honors Thesis II	Variable cr.

ECO 41150, ECO 41350, ECO 41450, ECO 49150, ECO 49250: Capstone

Two major Elective Courses (6 credits)

One of the following (3-4 credits)

MATH 20100	Calculus I	3
MATH 20500	Elements of Calculus	4

ECO 10400 can substitute for ECO 10250 and ECO 10350. ECO 19150 can substitute for ECO 10250 and ECO 10350.

Changes to these rules or what constitutes a Field are at the discretion of the approval of the BA advisor or the Chair of the department.

Subtotal: 43-44

Additional Requirements

At least a 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from all courses for the major, including Calculus, that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. Courses must have a grade of C- or better to fulfill the requirements of the major. A D grade is inadequate. In addition to college requirements for residency, at least two of the four "Major Core" and three of the four "Field" courses must be completed at CUNY.

Majors must place into calculus (MATH 20100 or MATH 20500 or higher) or may be required to complete the prerequisite sequence through MATH 19500.

Economics Minor

Requirements for Minor in Economics

Students take any 15 credits in ECO that are listed as required for the major in Economics. Students completing a minor in Economics must complete all course prerequisite courses including calculus.

Management and Administration Minor

Requirements for Minor in Management and Administration

Students take any 15 credits in ECO that are listed as required for the major in Management and Administration. Students completing a minor in Management must complete all course prerequisite courses including calculus.

Advisement

Majors should consult with an advisor at least once a year.

B.A. Program

Professor Kevin Foster
NA 4/121

B.A./M.A Program

Professor Marta Bengoa

NA 4/120C

Graduate Program

Professor Marta Bengoa
NA 4/120C

Departmental Activities

The Economics Society

The Economics Society is an undergraduate student organization.

Awards

The Department of Economics awards approximately \$30,000 in scholarships and fellowships annually each spring. For information, contact the department office.

Faculty

Punit Arora, Assistant Professor

B.A., D.A.V. College Punjab Univ. (India), M.P.A. Syracuse Univ., Ph.D.

Marta Bengoa Calvo, Associate Professor

B.A., Univ. Cantabria, (Spain), M.A., Ph.D.

Joseph Berechman, Marvin Kristein Professor

B.A., Hebrew Univ. M.B.A.; Ph.D., Univ. of Pennsylvania

Maria C. Binz-Scharf, Associate Professor

M.A., Bocconi Univ. Ph.D., Univ. of St. Gallen, Switzerland

Peter Chow, Professor

B.A., National Taiwan Univ.; M.S., Southern Illinois Univ., Ph.D.

Prabal Kumar De, Associate Professor

B.Sc., Presidency College (India); M.A., Jawaharlal Nehru Univ. (India);

M.A., New York Univ., Ph.D.

Kevin Foster, Associate Professor and Chair

B.A., Bard College; M.A., Yale Univ., Ph.D.

Mitchell H. Kellman, Professor

B.A., Univ. of Pennsylvania, M.A., Ph.D.

Matthew G. Nagler, Associate Professor

B.A., Cornell Univ.; Ph.D., Univ. of California (Berkeley)

Glenford Patterson, Lecturer

B.A., Georgia State Univ.; M.A., NYU; M.P.A., Columbia Univ.

Yochanan Shachmurove, Professor

B.A., Tel Aviv Univ. (Israel), M.B.A.; M.A., Univ. of Minnesota, Ph.D.

Kameshwari Shankar, Assistant Professor

B.A., Lady Shri Ram College, (India); M.A., Delhi School of Economics

(India); Ph.D., Cornell Univ.

Leonard Trugman, Lecturer

B.A., CUNY; M.A., Polytechnic Inst. of NY; D.Sci., Stevens Inst. of Tech.;

M.B.A., Fairleigh Dickinson Univ.

Yan Zhao, Associate Professor

B.A., Peking Univ. (China); M.S., Univ. of Nottingham (UK); Ph.D.,

Brandeis Univ.

Professors Emeriti

Stanley L. Friedlander

Malcolm Galatin

Benjamin Klebaner

Morris Silver

Department of English

(Division of Humanities and the Arts)

Professor Elizabeth Mazzola, Interim Chair • Department Office: NA 6/219 • Tel: 212-650-6302

General Information

The City College offers the following undergraduate degree in English:
B.A. in English (p. 188)

Programs and Objectives

Courses in literature and writing enhance the experience of students in virtually all areas of the liberal arts, the performing arts, and the sciences.

Departmental majors may concentrate in the following:

- Literature
- Creative Writing
- Secondary English Education

The discipline of English has changed dramatically over the past few decades, and the offerings of the City College English Department reflect those changes. The required "Introduction to Literary Study" course, ENGL 25000, takes the analysis of literary genres as its subject. This course helps students develop the basic vocabulary and skills of close textual analysis, while also introducing influential theoretical concepts and encouraging students to read literary texts in light of these ideas. The "Representative Writers" sequences in United States and British literature replace traditional surveys of major writers and provide a more interdisciplinary and intertextual approach to the American and British literary traditions. The "Selected Topics" courses offer visiting and permanent faculty members the opportunity to share their particular research interests with students, while the "Advanced Topics" and "Seminars" allow for comprehensive treatment of a particular topic in a more intimate classroom setting.

Creative Writing

The teaching of creative writing at the College began in 1919, and the Department's graduates include some of the most eminent authors of this century and the previous one. Workshops in fiction, poetry, and playwriting are regularly offered by professors who are themselves accomplished authors.

Secondary English Education

The teaching concentration is a specific regimen of literature, language, and writing courses required by most states (including New York) of candidates for high school teaching certification.

Publishing Certificate Program

This program is for students interested in pursuing a career in publishing. Students take four courses—one of which must be Introduction to Publishing—offered campus-wide in the editorial, marketing and design track. To complete the certificate, students must maintain a 3.0 average in their publishing courses and take part in paid internships at a publishing house suitable to their career goals. Faculty and guests include some of the leading publishing professionals in the country. For information, contact David Unger, the Program Director, at 212-650-7925.

The English Honors Program

Majors and minors with a 3.3 GPA who have taken at least two upper-division English electives may apply to the English Honors Program, which includes two seminars and a course devoted to the writing of a thesis under the supervision of a faculty mentor. The program also offers advising, lectures, and opportunities for students to share their work. Creative writing students may submit a manuscript of poems or stories in lieu of the thesis. Students should contact the program's administrative assistant, Ms. Renee Philippi, or the Program Director, Professor Mikhail Dekel for information.

English, Bachelor of Arts (B.A.)

Requirements for English Majors

Students who declare an English major in the Fall 2013 term and after are required to maintain a major GPA of 2.5 or higher. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the

degree. Students whose departmental GPA falls below 2.5 will be notified and given one year's probation in the major. They will be called in for a conference with a departmental advisor to discuss ways of improving academic performance. The advisor may recommend taking a particular course for better preparation, meeting with a tutor in the Writing Center, taking a course load lower than 15 credits, or other strategies for achieving academic success. All students should try to maintain the highest possible GPA in order to enhance their prospects for acceptance to graduate programs and career opportunities.

Areas of Concentration

English majors choose one of the three areas of concentration and complete their course of study as listed below:

Literature

ENGL 25000	Introduction to Literary Study One additional 200-level course drawn from the following:	3
ENGL 25100-25400	Historical Survey of British Literature	3
ENGL 26000-26900	Studies in Genre	3
ENGL 27000-27010	Literatures of Diversity	3
ENGL 28000	Introduction to Comparative Literature Two courses required at 300-level One 300-level class may be taken simultaneous with a 200-level class, but two 200-level classes are needed for additional work at the 300-level	6
	Two courses at the 400 level, to be taken after completion of two 300-level classes	6
	Electives (any English Department course at the 200-, 300-, 400-level, but no more than four 200-level classes. One course may be ENGL 220 or 230, but Publishing Certificate classes cannot be used to fulfill these requirements.)	18
	One course (300-level or above) taken in another department and approved as an interdisciplinary elective	3
	Subtotal: 39	

Creative Writing

ENGL 25000	Introduction to Literary Study	3
ENGL	One additional 200 level course drawn from the following:	3
ENGL 25100-25400	Historical Survey of British Literature	3
ENGL 26000-26900	Studies in Genre	3
ENGL 27000-27010	Literatures of Diversity	3
ENGL 28000	Introduction to Comparative Literature Additional Literature Courses	3
ENGL 22000	Introductory Workshop in Creative Writing	3
ENGL 22100	Intermediate Creative Writing: Reading as Writers	3
	Creative writing (22000 or 30000-	12

level or above)

Secondary English Education

ENGL 25000	Introduction to Literary Study	3
ENGL 35000	Hist Approach-Lit 1	3
ENGL 35100	Hist Approach Lit 2	3
	OR	
	any 300-level Representative Writers course	3
	Specific courses required by the New York State Department of Education	21
	Electives	9

[See the senior departmental advisor for appropriate requirements.]

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

English Minor

The Department offers a minor as well as a major in English.

Required Courses

ENGL 25000	Introduction to Literary Study	3
ENGL	Additional credits in English (22000-level or above)	12

Subtotal: 15

Advisement**English**

Professor Daniel Gustafson NA 6/219; 212-650-6360

English Honors Program

Professor Mikhail Dekel
Fellowship Office
NA 6/348; 212-650-6305

Publications*Fiction*, the internationally renowned literary magazine.*Promethean*, the City College literary magazine.**Events and Productions**

Members of the English Department arrange events throughout the year, including:

The Langston Hughes Festival

The Spring Poetry Festival

The English Department Annual Awards Ceremony

Awards

The Department of English awards \$50,000 in prizes and over \$20,000 in grants every year to undergraduate students.

Creative Writing Awards

- The Henry Roth Memorial Scholarship
- The Goodman Fund Grants
- The Goodman Fund Short Story Award
- The Undergraduate Children's Writing Award

Poetry Awards

- The David Markowitz Poetry Award
- The Esther Unger Poetry Award

- The Goodman Fund Poetry Award

Essay Awards

- The Allan Danzig Memorial Award in Victorian and Romantic Literature
- The David Markowitz Essay Award
- The Riggs Gold Medal Essay Award

The Irwin and Alice Stark Awards

- The Stark Short Fiction Prize
- The Stark Award in Fiction in Honor of Henry R. Roth
- The Stark Award for Essay in Literature
- The Stark Award in Drama in Memory of Ross Alexander
- The Stark English Composition Award in Memory of Mina Shaughnessy

General Excellence Awards

- The Albert Friend Award for Excellence in Medieval Studies
- The Edward C. and Ruth P. Mack Graduate Fellowship
- The Julius and Elizabeth Isaacs Scholarship
- The Leon/Ward Prize
- The Paul Roberts Memorial Scholarship Fund
- The Richard Shephard Award for Excellence in Writing
- The Sydney Jacoff Graduate Fellowship
- The Toni Cade Bambara Endowed Scholarship
- The William Bradley Otis Fellowship in American Literature

Faculty

Salar Abdoh, Professor
B.A., U.C. Berkeley; M.A. City College

Doris Barkin, Lecturer
B.A., Queens College; M.A., CUNY; Ph.D., CUNY Graduate Center

Richard Braverman, Lecturer
B.A., Hamilton College; M.A., Columbia University, Ph.D.

Carla Cappetti, Professor
B.A., Torino; M.A., Univ. of Wisconsin; M. Phil., Columbia Univ., Ph.D.

Mikhail Dekel, Professor
Tel Aviv School of Law; M.A., The City College; Ph.D., Columbia University

Lyn Di Iorio, Professor
B.A., Harvard Univ.; M.A., Stanford Univ.; Ph.D., Univ. Of California (Berkeley)

Grazyna Drabik, Lecturer
M.A., Univ. of Warsaw; M.A., Columbia Univ., M. Phil.

Keith Gandal, Professor
B.A., Amherst College, M.A.; Ph.D., Univ. of California (Berkeley)

Barbara Gleason, Professor
B.S., Univ. of Missouri (Columbia); M.A., Oklahoma State Univ.; Ph.D., Univ. of Southern California

Daniel Gustafson, Assistant Professor
B.A., Kenyon College; M.A., Yale University, Ph.D.

Robert Higney, Assistant Professor
B.A., Boston College; M.A. Johns Hopkins Univ., Ph.D.

Laura Hinton, Professor
B.A., Univ. of Arizona, M.A.; Ph.D., Stanford Univ.

Andr s Kis ry, Associate Professor
M.A., Univ. of Bristol (U.K.); M.Phil., Columbia Univ., Ph.D.

Pamela Laskin, Lecturer
B.A., Harper College, M.A.

Elizabeth Mazzola, Professor

B.A., Univ. of Virginia, M.A., New York Univ., Ph.D.

Renata Kobetts Miller, Associate Professor
B.A., Princeton; M.A., Indiana University, Ph.D.

Mark Jay Mirsky, Professor
B.A., Harvard Univ.; M.A., Stanford Univ.

Geraldine Murphy, Professor
B.A., Boston Univ.; M.A., Columbia Univ., Ph.D.

Paul Oppenheimer, Professor
B.A., Princeton Univ.; M.A., Columbia Univ., Ph.D.

Václav Paris, Assistant Professor
B.A., University College London; M.Phil. Cambridge Univ.; Ph.D. Univ. of Pennsylvania

Thomas Peele, Associate Professor
B.A., New York Univ.; M.A., City College of New York; Ph.D., Univ. of South Florida

Emily Raboteau, Professor
B.A., Yale Univ.; M.F.A., New York Univ.

Fred Reynolds, Professor
B.A. Midwestern State Univ.; M.A., M.A. (Speech), Univ. of Oklahoma, Ph.D.

Cheryl Sterling, Associate Professor
B.A., Fordham Univ.; M.Phil. Univ. of Ghana; Ph.D., Univ. of Wisconsin-Madison

Gordon Thompson, Professor
B.A., The City College; M.A., Yale Univ., Ph.D.

Michelle Valladares, Lecturer
B.A., Bryn Mawr College; M.F.A., Sarah Lawrence College

Harold Aram Veaser, Professor
B.A., Columbia Univ., M.A., Ph.D.

Melissa Watson, Assistant Professor
A.A., American River College; B.A., San Diego State Univ., MA; Ph.D., Syracuse Univ.

Joshua Wilner, Professor
B.A., Cornell Univ.; M. Phil., Yale Univ., Ph.D.

Professors Emeriti

Linsey Abrams
Marcia Allentuck
Ilona Anderson
Nathan Berall
Felicia Bonaparte
David P. Buckley
Arthur K. Burt
Gladys Carro
Alice Chandler
Morton Cohen
James de Jongh
Barbara Fisher
Byrne R. S. Fone
Arthur Ganz
Robert Ghiradella
Arthur Golden
Frederick Goldin
Ralph Gordon

Theodore Gross

Leon Guilhamet

Marilyn Hacker

Jo-Ann W. Hamilton

James Hatch

Mary V. Jackson

Leonard Kriegel

Valerie Krishna

Patricia Laurence

Daniel Lear

Karl Malkoff

Philip Miller

Robert K. Morris

Stephen Merton

Nathaniel Norment, Jr.

William L. Payne

Beatrice Popper

Irving Rosenthal

Earl Rovit

Paul Sherwin

Robert Silber

Frederic Tuten

Geoffrey Wagner

Michele Wallace

Barry Wallenstein

Barbara Bellow Watson

English as a Second Language Courses

(Division of Humanities and the Arts)

General Information

Courses in American English are offered to non-native speakers whose CUNY/ACT scores indicate that their language skills (

listening, speaking, reading, and writing) are insufficient for college-level work. The goals of the program are to help students become fluent, clear and correct in their writing, reading and oral communication skills.

The coursework in the ESL Department is on two levels. Students are placed in class on the basis of their CUNY/ACT scores; ENGL 11000 must be taken following completion of the Level II courses; SPCH 11100 may be taken following completion of ESL 03000. Upon completion of ENGL 11000 and SPCH 11100, students should be ready to pass the CUNY Proficiency Examination and Speech Proficiency Examination.

Students are permitted to take ESL classes along with certain liberal arts electives and Core required courses. Students are encouraged to advance as rapidly as possible. A student may be exempted from any course in the sequence upon recommendation of the instructor and approval by the course coordinator.

English as a Second Language Course Descriptions (p. 62)

Environmental Earth Systems Science Program

Interdisciplinary Program of the Division of Science and the Grove School of Engineering)

Professor Marco J. Castaldi, Program Director • ST 307 • Tel: 212-650-6679

Professor Kyle McDonald, Program Deputy Director • MR 925 • Tel: 212-650-6984

Associate Professor Patricia Kenyon, Science Advisor • MR 933 • Tel: 212-650-6472

Dr. Liubov Kreminska, Program Administrator • ST 421 • Tel: 212-650-8299

General Information

The City College offers the following undergraduate degree in Environmental Earth Systems Science:

B.S. (p. 191)

Programs and Objectives

Environmental Earth Systems Science (EESS) is designed for students interested in emerging environmental issues as well as environmental policy. A combined curriculum of science and engineering courses provides a foundation for studying emission control, climate change, global warming, resource management, public health, and environmental remediation. These broad areas will continue to drive environmental research for the coming decades with the goal of providing lawmakers with accurate information for developing sound environmental policies. The EESS degree program is designed to connect to major existing environmental research programs at CCNY, including the National Oceanic and Atmospheric Administration Center for Cooperative Remote Sensing Science and Technology (NOAA-CREST) and the National Aeronautics and Space Administration Center for Optical Sensing and Imaging (NASA-COSI). Together, the curriculum and associated science and engineering research provide a superior basis for entry into careers in environmental and earth system science at local and federal levels and in related industries as well as government regulatory and policy arenas.

Program Facilities and Research

Environmental Earth Systems Science and the related centers provide state-of-the-art equipment in the areas of remote sensing, hydrology and groundwater hydrology, emergent contaminant evaluation and remediation, subsurface sensing-environmental geophysics, aerosol particulate collection and analysis and a host of related fields. The remote sensing laboratories coordinate a state-of-the-art LIDAR sensor with environmental aerosol collectors (such as the Environmental Beta-Attenuation Monitor) and a new satellite receiving station together with sophisticated satellite data analysis software (such as Interactive Data Language and ENVI). The EESS facilities also include a complete Weather Center that operates a wide range of weather-analyzing systems including a Mesoscale Meteorological System (MMS) and coordinated links with the National Weather Service.

The Geochemical and Geophysical Laboratories include an extensive array of equipment including X-ray diffraction, atomic absorption spectrometers, inductively coupled mass spectrometer, gas chromatography-mass spectrometry, and ion chromatography. Specialized systems include photo-dye tracing diffusion systems, electrical and electromagnetic survey equipment, an engineering seismic system, a proton precession magnetometer and related techniques. The laboratories have access to scanning and transmission electron microscopes and image-processing software.

Environmental Earth Systems Science, Bachelor of Science (B.S.)

Program Requirements

The EESS Program leads to a Bachelor of Science degree whereas its sister program Earth System Science and Environmental Engineering leads to a Bachelor of Engineering degree (see the Engineering Section of this Bulletin). The two programs share some of the lower and upper division courses, but do not have the same requirements. Both programs have suggested degree concentrations for students, but these can be modified to better suit a particular area of study interest. There is an EESS/ESE Committee responsible for assuring that course tracks are appropriate for each student.

Students entering the EESS will be advised by the EESS general advisor, Associate Professor Patricia Kenyon. By year three, students are expected to declare a concentration focusing on a particular environmental area of study and create an appropriate program of study from a list of approved Elective Courses.

Flexibility within EESS is achieved by creating a core sequence of essential courses and a relatively large number of electives. This allows a student to focus on specific career objectives.

Requirements for EESS Majors

A GPA of 2.0 or higher in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

All EESS majors must take the basic mathematics and science courses and the Major Requirements listed below. In addition, each student will complete the requirements for one of the three concentrations listed. Courses marked with * must be completed with a minimum grade of C.

Foundational courses for the EESS program must be completed before embarking upon related courses in the major. Students with appropriate background as demonstrated by the College's Placement Exam may be exempted from some or all Foundational Courses. The foundational course for Calculus I (Math 20100) is Pre-Calculus (Math 19500), and this course must be passed with a grade of C or higher in order to proceed to the next level.

Required Science Courses (includes Science and Math Requirements in General Education Core):

BIO 10100	Biological Foundations I	4
CSC 10200	Introduction for Computing	3
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
PHYS 20700	University Physics I	4
PHYS 20800	University Physics II	4

CHEM 10301-10401, PHYS 20700-20800: Minimum grade of "C" required

One of the following two courses:

EAS 10600	Earth Systems Science	4
ENGR 10610	Introduction to Earth System Science and Engineering	4

Required Mathematics courses:

MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 39100	Methods of Differential Equations	3

MATH 20100, MATH 20200, MATH 20300, MATH 39100: Minimum grade of "C" required

Major Requirements:

EAS 21700	Systems Analysis of the Earth	4
EAS 30800	ESS Modeling/Databases	3
EAS 30000	Earth and Environmental Science	1

	Seminar	
EAS 33000	Geographic Information Systems	3
EAS 472**	Environmental Project	4-6
CHEM 33000	Physical Chemistry I	3

Total Required Credits 58-60

Technical Electives for Student's Concentration

27 credits of electives from one of the following concentrations:

Concentration 1: Environmental Chemistry:

EAS 41300	Environmental Geochemistry	3
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A minimum of 5 additional courses in Chemistry, plus additional electives, both from the Program Technical Electives List below, to reach 27 credits.

Concentration 2: Hydrology and Climate:

EAS 30900	Fundamentals of Atmospheric Science	3
EAS 34500	Hydrology	3
EAS 41300	Environmental Geochemistry	3
EAS 42600	Environmental Remote Sensing and Image Analysis	3
EAS 44600	Groundwater Hydrology	3
EAS 48800	Climate Change	3

Additional electives from the Program Technical Electives List below to reach 27 credits.

Concentration 3: Ecosystems and Environmental Science:

BIO 10200	Biological Foundations II	4
BIO 20600	Introduction to Genetics	4
BIO 22800	Ecology and Evolution	4

A minimum of 2 additional courses in biology, plus additional credits, both from the Program Technical Electives List below to reach 27 credits.

Total required credits plus technical electives 85-87

Total credits for graduation 120

Program Technical Electives:

BIO 10200	Biological Foundations II	4
BIO 20700	Organismic Biology	4
BIO 22800	Ecology and Evolution	4
BIO 22900	Cell and Molecular Biology	4
BIO 34500	Botany	4
BIO 35000	Advanced Microbiology	4
BIO 45300	Conservation Biology	3
BIO 45500	Advanced Ecology	3
BIO 45900	Biological Oceanography	3
BIO 48500	Evolution	3
CHEM 24300	Quantitative Analysis	4
CHEM 26100	Organic Chemistry I	3
CHEM 26300	Organic Chemistry II	3
CHEM 33200	Physical Chemistry II	3
CHEM 40600	Environmental Chemistry	3
CHEM 40601	Environmental Chemistry Laboratory	2
CHEM 40700	Environmental Organic Chemistry	3
EAS 22700	Structural Geology	4
EAS 30900	Fundamentals of Atmospheric Science	3
EAS 32800	Global Environmental Hazards	3
EAS 33300	Phase I Environmental Site Assessments	3

EAS 33400	Phase II Environmental Site Assessments	3
EAS 34500	Hydrology	3
EAS 36500	Coast and Ocean Processes	3
EAS 41300	Environmental Geochemistry	3
EAS 41700	Satellite Meteorology	3
EAS 42600	Environmental Remote Sensing and Image Analysis	3
EAS 43000	Sedimentology	3
EAS 43900	Mineral/Energy Resources	4
EAS 44600	Groundwater Hydrology	3
EAS 45000	Environmental Field Methods	3
EAS 48800	Climate Change	3
EAS 56100	Geophysics	3
EAS 56500	Environmental Geophysics	3
EAS 56600	Solid Earth Geochemistry	3

Additional Requirements

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements (Pathways) (p. 286) section of the Bulletin for more information. Earth and Atmospheric Science students will satisfy their "Pathways" requirements most efficiently by following these recommendations:

Fixed Core

English Composition I:

FIQWS	Freshman Inquiry Writing Seminar	6
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English Composition II:

ENGL 21003	Writing for the Sciences	3
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Mathematical and Quantitative Reasoning:

MATH 20100	Calculus I	3
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Life and Physical Sciences:

CHEM 10301	General Chemistry I	4
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Flexible Core

World Cultures and Global Issues:

any CLAS offerings in this category

Individual and Society:

any CLAS offerings in this category

U.S. Experience in its Diversity:

any CLAS offerings in this category

Creative Expression:

any CLAS offerings in this category

Scientific World:

BIO 10100	Biological Foundations I	4
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Additional course in Scientific World:

CHEM 10401	General Chemistry II	4
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OR

PHYS 20700

College Option

Speech

SPCH 11100	Foundations of Speech	3
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Communication

OR

SPCH 00380

or exemption on the basis of demonstrated proficiency

Foreign language

two semesters of college-level study, or exemption on the basis of two years of high-school level study, or demonstrated proficiency

Philosophy

any CLAS offerings in this category

Faculty

For a complete list of participating Science and Engineering Faculty, please refer to the section on Earth System Science and Environmental Engineering (p. 274) in the Grove School of Engineering section of this Bulletin.

Department of History

(Division of Humanities and the Arts)

Professor Anne Kornhauser Chair • Department Office: NA 5/144A • Tel: 212-650-7137

General Information

The City College offers the following undergraduate and combined degrees in History:

B.A. in History (p. 193)

B.A./M.A. (Combined Degree) in History (p. 194)

Programs and Objectives

History is basic to a college education: it provides the knowledge of where we have been that is essential to any individual's understanding of his or her role in contemporary society; it advances analytical skills and promotes the expression of one's ideas in writing and speech; and it encourages students to think critically, which includes the ability to evaluate material and draw appropriate conclusions. The offerings at City College are designed to meet the needs of our diverse student body.

Many occupations are open to history majors beyond those in the teaching area, including positions in business and industry, law, communications, and numerous agencies of government at all levels. A strong background in history also complements majors in social sciences because it provides the perspective that deepens one's understanding of contemporary developments and problems. In addition, historical study traditionally has been an asset to those interested in literature and other humanities and arts areas.

History, Bachelor of Arts (B.A.)

Requirements for Majors

History majors are required to maintain a major GPA of 2.0 or higher. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.0 and above to graduate with a BA in History. Students must take a total of 11 History courses for a total of 33 credits.

Required Courses

HIST 21300 The Historian's Craft 3

10 electives (of which no more than 4 shall be 200-level)

Up to two related courses (6 cr.) may be taken outside the History Department, subject to the approval of an advisor or the department Chair.

Choose 2 Courses Each from among the Following 3 Categories:

- The Americas (Latin America and U.S.)
- Asia, Africa, the Middle East
- Europe

The Americas

HIST 24000	The United States: From Its Origins to 1877	3
HIST 24100	The United States: Since 1865	3
HIST 28000	Latin America in World History	3
HIST 28100	Colonial Latin America	3
HIST 28200	Modern and Contemporary Latin America	3
HIST 32100	Early America: From Settlement to the Great Awakening	3
HIST 32200	The Era of the American Revolution	3
HIST 32300	The New Nation, Slave and Free	3
HIST 32400	The Era of Civil War and Reconstruction, 1840-1877	3
HIST 32501	The Gilded Age and Progressive Era, 1877-1920	3
HIST 32600	The U.S. from 1914-1945	3
HIST 32700	The U.S. Since 1945	3
HIST 36100	The Writing of American History	3
HIST 36300	African-American History to Emancipation	3
HIST 36500	African-American History from Emancipation to the Present	3
HIST 36600	U. S. Women's Movement	3
HIST 37000	American Legal History	3
HIST 37500	U.S. South	3
HIST 37800	American Liberalism	3
HIST 44000	Labor, Technology, and the Changing Workplace	3
HIST 44100	The History of American Labor	3
HIST 44800	American Urban History	3
HIST 44900	Power, Race, and Culture: The History of New York City	3
HIST 45100	Comparative Slavery	3
HIST 47700	The Vietnam War and U.S. Society	3
HIST 48100	Power and Resistance in Latin America	3
HIST 48200	Women and Gender Relations in Latin America	3
HIST 21001-21999	Special Topics in History	3
HIST 31100-32000	Selected Topics in History	3

Asia, Africa, and the Middle East

HIST 25100	Traditional China	3
HIST 25300	Modern China	3
HIST 25400	Traditional Japan	3
HIST 25500	Modern Japan	3
HIST 26200	The Middle East Under Islam	3
HIST 26300	Traditional Civilization of India	3
HIST 26400	Modern India	3
HIST 27600	Africa and the Modern World	3
HIST 27700	Africa Since Independence	3
HIST 33350	Twentieth-Century China	3
HIST 33450	China's "Cultural Revolution," 1966-1976	3
HIST 33550	Japanese Society since WWII	3
HIST 33800	Islamic Political Movements	3
HIST 34450	The Modern Middle East	3
HIST 37600	Women of the African Diaspora	3
HIST 43000	France and Francophone Africa	3
HIST 45100	Comparative Slavery	3
HIST 45400	Science and Technology in China	3

HIST 46400	Science and Technology in China	3
HIST 46600	The Japanese Empire in the 20th Century	3
HIST 46700	The Pacific War, 1931-1945	3
HIST 46800	Architecture in Modern India	3
HIST 46900	Indian Cinema and Popular Culture	3
HIST 47000	Religions of India	3
HIST 47100	Pakistan: Religion, Military, and the State	3
HIST 48500	Women and Gender in the Middle East	3
HIST 48600	Arab-Israeli Conflict	3
HIST 48700	Islamic Poilit Mvmt	3
HIST 48800	History of African Nationalist Thought	3
HIST 49100	Decolonization in Africa and the Caribbean	3
HIST 21001-21999	Special Topics in History	3
HIST 31100-32000	Selected Topics in History	3
Europe		
HIST 20100	The Ancient World: The Near East and Greece	3
HIST 20200	The Ancient World: Rome	3
HIST 20400	Early-Modern Europe	3
HIST 20600	Modern Europe	3
HIST 32500	The Age of the Renaissance	3
HIST 32850	The French Revolution	3
HIST 32950	History of the Soviet Union	3
HIST 34200	The History of Medicine	3
HIST 35000	The Scientific Revolution	3
HIST 35100	The Age of Enlightenment	3
HIST 35101	Science, Technology, and Modernity	3
HIST 35200	Intellectual History of Modern Europe	3
HIST 35700	History of Socialism	3
HIST 37900	The Collapse of Communism and Post-Soviet Europe	3
HIST 41201	Law & Society in Medieval and Early Modern Europe	3
HIST 41600	The Early-Modern European City	3
HIST 42000	The Modern European City	3
HIST 42100	Work and Welfare in Modern Europe	3
HIST 42300	Psychiatry, Madness, and Society	3
HIST 42400	The Great War	3
HIST 42500	Age of Dictators	3
HIST 42900	Minorities in Modern Europe	3
HIST 43000	France and Francophone Africa	3
HIST 44500	European Land Empires	3
HIST 49300	Einstein and His World	3
HIST 21001-21999	Special Topics in History	3
HIST 31100-32000	Selected Topics in History	3

4 Additional Electives of the Student's Choosing

Subtotal: 33

Teaching Social Studies in Secondary Schools

Students wishing to teach history in secondary schools must be certified in the area of Social Studies. Major requirements are listed below.

Students should also consult Professor Shira Epstein (School of Education).

Required Courses

Two courses in American History	6
Two courses in European History	6
One course in two of the following areas: Asian History, African History and Latin American History	6
Additional History courses in one area (American, African, Asian, European)	12
Additional History Elective	3
Upper division course in Economics or Political Science	3
Subtotal:	36

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

History, Bachelor of Arts/Master of Arts (B.A./M.A.)**The B.A./M.A. Degree**

The department offers a B.A./M.A. program that enables outstanding students to receive both degrees in four to five years upon the completion of 138 credits. For details see the Chair or the Director of Graduate Studies.

History Minor

Students wishing to complete a minor in History must complete 15 credits of elective courses chosen in consultation with an advisor.

Advisement

Please inquire about History advising in the Department Office: NA 5/144, or check the Department's homepage for current advisors and their office hours. The Department Chair also serves as an advisor.

Majors in the Department of History are expected to maintain a minimum GPA of 2.0. Those who fall below that number will be called in for a conference with a departmental advisor to discuss ways of improving academic performance. The advisor may recommend taking a particular course for better preparation, meeting with a tutor in the Writing Center, taking a course load lower than 15 credits, or other strategies for achieving academic success. All students should try to maintain the highest possible GPA in order to enhance their prospects for acceptance to graduate pro-grams and career opportunities.

Department Activities

The History Society meets during club hours and provides a student voice in departmental affairs. Participants in the History Society, discuss problems in the field of history, invite and hear speakers to campus, and host career-oriented events. Open to all interested students.

Awards

The History Department awards a number of prizes and grants to outstanding undergraduates. For detailed information see the Chair of the History Department.

Paul Aron Award

For the best undergraduate research paper.

Charles T. Cromwell Award

For a senior History major with the highest average in History.

Baily W. Diffie Award

For outstanding work in a core course.

Carl Dunat Scholarship

To help support future studies.

Joan Kelly Prize

For the best essay written in an elective course in History.

Oscar Lloyd Meyerson Prize

For the best Honors essay.

Sidney I. Pomerantz Prize

For the best essay on the history of New York City written in an elective course.

J. Salwyn Shapiro Award

For a senior who has done outstanding work in European History.

General Tremain Prize

For a student who writes the best essay on some aspect of American History related to the Civil War.

Joseph E. Wisan Prize

For the best essay on 20th century American History written in an elective course.

Faculty

Harriet Alonso, Professor

B.S., New York Univ.; M.A., Sarah Lawrence; Ph.D., SUNY (Stony Brook)

Beth Baron, Professor

B.A., Dartmouth College; M.A., Univ. of London; Ph.D., Univ. of California (Los Angeles)

Susan K. Besse, Associate Professor

Certificat, Institut d'Etudes du Developpement, Geneva, Switzerland; B.A., Smith College; Ph.D., Yale Univ.

Barbara Brooks, Associate Professor

B.A., Yale Univ.; Ph.D., Princeton Univ.

Craig Daigle, Associate Professor and Chair

B.A., Univ. of Maryland; M.A., James Madison Univ.; Ph.D., George Washington Univ.

Gregory P. Downs, Associate Professor

B.A., Yale Univ.; M.F.A., Univ. of Iowa; M.A., Northwestern Univ.; Ph.D., Univ. of Pennsylvania

John Gillody, Lecturer

B.A., UCLA.; M.A., Columbia Univ., Ph.D.

Emily Greble, Associate Professor

B.A., The College of William & Mary, M.A., Stanford Univ.; Ph.D.

Venus Green, Associate Professor

B.A., Hunter College; M.A., Columbia Univ., Ph.D.

Danian Hu, Associate Professor

B.E., Beujung Jiaotong Univ.; M.A., Case Western Reserve Univ.; Ph.D., Yale Univ.

David Johnson, Associate Professor

B.A., Univ. of Sussex, England, M.A., Univ. of London, Ph.D.

Ravi Kalia, Professor

B.A., Univ. of Delhi, M.A.; M.B.A, Univ. of California (Los Angeles), Ph.D.

Andreas Killen, Professor

B.A., Reed College (English); M.A., New York Univ., Ph.D.

Anne M. Kornhauser, Assistant Professor

B.A., Barnard College; M.A., Columbia Univ., Ph.D.

Barbara Naddeo, Associate Professor

B.A., Princeton Univ.; Ph.D., Univ. of Chicago

Adrienne Petty-Roberts, Assistant Professor

B.S., Northwestern Univ.; M.A., Columbia Univ., Ph.D.

Gerardo Renique, Associate Professor

B.S., Universidad Nacional Agraria (Peru); M.A., Columbia Univ., Ph.D.

Clifford Rosenberg, Associate Professor

B.A., Carleton College; M.A., Princeton Univ., Ph.D.

Susan Semel, Professor

A.B., Wheaton College; M.A.T., Ed.M., Ed.D., Teachers College, Columbia Univ.

Darren Staloff, Professor

B.A., Columbia College; M.A., Columbia Univ., Ph.D.

Judith Stein, Distinguished Professor

B.A., Vassar College; Ph.D., Yale Univ.

Barbara Syrrakos, Lecturer

B.A. Univ. of Wisconsin, M.A. ;, M.A., New School for Social Research, Ph.D.

Matthew Vaz, Lecturer

B.S., Cornell Univ.; M.S. Brooklyn College; M.A., Columbia Univ., Ph.D.

Eric Weitz, Professor & Dean of Humanities and the Arts

B.A., SUNY Binghamton; M.A., Boston Univ., Ph.D.

Professors Emeriti

Bernard Bellush

Fred L. Israel

Lawrence Kaplan

Thomas H.C. Lee

Radmila Milentijevic

Dante A. Puzzo

George Schwab

Conrad M. Schirokauer

Richard Skolnik

Herbert A. Strauss

Walter Struve

Arthur Tiedemann

Robert Twombly

Martin Waldman

Joel Weiner

Irwin Yellowitz

Oscar Zeichner

History and Philosophy of Science and Technology Program

(Division of Humanities and the Arts)

Program Office: NA 5/144

General Information

The program offers and coordinates courses for the following purposes:

- History and/or philosophy specialization in the history and philosophy of science and technology, as a preparation for graduate study in these fields;
- Electives for pre-professional programs in medicine, law, teacher education;
- Electives or sub-specialization for students of liberal arts and science who want to enhance their general education through a better understanding of the role of science and technology in the world.

Requirements for Specialization

In addition to their major requirements, History and Philosophy majors seeking specialization in History and Philosophy of Science and

Technology complete a series of courses chosen in consultation with their advisor. Students completing majors other than history or philosophy and seeking elective coursework in History and Philosophy of Science and Technology should consult an advisor in either the History or Philosophy department.

Department of Interdisciplinary Arts and Sciences

Division of Interdisciplinary Studies
Professor Juan Carlos Mercado, Dean
Professor Kathlene McDonald, Chair
 25 Broadway 7th Floor
 New York, New York
 Telephone: 212-925-6625
<http://www.ccny.cuny.edu/cwe>

General Information

The City College offers the following undergraduate degrees through the Department of Interdisciplinary Arts & Sciences:

- B.A. in Interdisciplinary Arts and Sciences (p. 196)
- B.S. in Early Childhood Education (p. 197)
- B.A./M.A. (combined degree) in the Study of the Americas (p. 197)

The Center for Worker Education, first established in 1981 by a collaboration of The City College, public employers, and public employee unions became the Division of Interdisciplinary Studies in 2006. The Center for Worker Education name has been retained as the name of the City College satellite campus at Bowling Green, where the Department of Interdisciplinary Arts & Sciences and the Undergraduate Program in Early Childhood Education are housed. Classes and offices are located in the historic Cunard Building at 25 Broadway, 7th Floor, near Battery Park and South Ferry.

Mission Statement

The primary mission of the Division of Interdisciplinary Studies at the Center for Worker Education (CWE) is to provide an excellent education to working adults from New York City and surrounding regions. CWE offers an interdisciplinary Bachelor of Arts degree, a Bachelor of Science degree in Early Childhood Education, and a B.A./M.A. in the Study of the Americas. CWE serves a population that would otherwise be underserved by the College, and its courses and educational programs are specifically designed for students whose access to higher education may have been limited or interrupted due to financial limitations, work responsibilities, and family obligations.

A spirit of open inquiry, curricular innovation, and academic integrity are linchpins of the CWE mission. Equally important are respect for diversity among faculty, staff, and students, and a continuous search for our common ground as learners, teachers, and scholars. In providing its program, CWE seeks mutually beneficial relationships with labor unions, community-based organizations, city agencies, and employers in both the non-profit and private sectors who share our educational mission. With a dual focus on excellence and access, and by reaching out to the community, CWE aims to be a positive force in lower Manhattan and the New York metropolitan area.

Programs and Objectives

Interdisciplinary Arts and Sciences offers a flexible education customized for working adults and transfer students and provides them with a framework that allows them to connect their learning in the classroom in ways that are relevant to the workplace and the world. Students learn to think, read, and write critically through a curriculum that emphasizes approaches for evaluating and communicating information in a variety of formats: written, oral, and digital.

Most courses are 4 credits and meet once per week in the evenings and during the day on Saturdays. Online and hybrid courses are also available.

The Center also sponsors research and conferences that reflect its interdisciplinary approach to teaching and learning, including the

Women and Work Conference, the Book Talk Series, the Is Hip Hop History? Conference, and the Patai Lecture Series.

Admission

All students must apply for admission directly at CWE. Students with a high school diploma, GED, or Associate's degree or other accumulated undergraduate transfer credits are eligible to apply. The program is geared for students twenty-five years and older; exceptions may be made for younger students who are working full time. The first step in the application process is to attend an orientation/admissions workshop. Please check the CWE website (<https://ccny.cuny.edu/cwe>) for workshop dates. After you have been accepted, you will be required to see an advisor by individual appointment in order to select and register for courses.

Academic Advisement

Advising has been at the heart of the academic experience at CWE since the beginning of the program. From the point of admission, students meet with an advisor at least once a semester to discuss academic and intellectual goals and strategies, to register for classes, and to plan their academic careers in conjunction with work, family and personal schedules.

CWE Academic Advisors:

- provide guidance, assistance and information to students regarding course selection for their chosen concentration (B.A.) or co-concentration (B.S.);
- facilitate the development of a coherent course plan aimed at successfully completing a B.A. or B.S. degree;
- provide information about college policies, offices and services and assist students in course withdrawals, appeals, degree verification and planning for graduate school;
- serve as liaisons between students, CWE, and the uptown CCNY campus and refer students to appropriate resources provided by CCNY and CWE

Interdisciplinary Arts and Sciences, Bachelor of Arts (B.A.)

Requirements for the Degree

CWE Pathways Requirements

CWE has been granted a waiver from the CUNY Office of Academic Affairs to offer a 40-credit Pathways General Education curriculum that integrates both the Pathways Common Core and the College Option. Students will take ten four-credit courses that fulfill all the areas of the Required and Flexible Core and the College Option, with some adjustments for transfer students.

Required Core

English Composition

IAS 10000	Writing for Interdisciplinary Studies I	4
IAS 10100	Writing for Interdisciplinary Studies II	4

Mathematics and Quantitative Reasoning:

MATH 15000	Mathematics for the Contemporary World OR	3
MATH 18000	Quantitative Reasoning	3

Life and Physical Sciences:

IAS 10400	Nature & Human Beings I	4
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Flexible Core

World Cultures and Global Issues (students must take two courses in this area)

SPAN 12104	Intro Spanish I	4
SPAN 12204	Intro Spanish II	4

*For students with a foreign language exemption, see below.

U.S. Experience in its Diversity:

HIST 12404	American Civilization I OR	4
PSC 10104	U S Politics & Govt	4

Creative Expression:

ART 29104	Women in World Art	4
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Individual and Society:

IAS 31292	Intro Urban Stud Pla OR	4
SOC 38144	School and American Societies/Sociology of Education OR	4
PSY 10204	Psychology in the Modern World	4

Scientific World:

IAS 10500	Nature and Human Beings II	4
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College Option for transfer students without an Associate's Degree

SPAN 12104	Intro Spanish I	4
SPAN 12204	Intro Spanish II OR Approved World Cultures and Global issues substitute if language requirement met (see advisor for details)	4
SPAN 22300	Intermediate	2

College Option for transfer students with an Associate's Degree

SPAN 12104	Intro Spanish I OR Approved World Cultures and Global issues substitute if language requirement met (see advisor for details)	4
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B.A. in Interdisciplinary Arts and Sciences

For the B.A. degree, students select an interdisciplinary concentration in consultation with their advisors, completing an approach to learning that includes a broad and flexible selection of courses. Interdisciplinary Arts and Sciences majors need to take three required major courses, for a total of 12 credits:

Required Courses

IAS 24200	Introduction to Interdisciplinary Studies	4
IAS 23324	Advanced Composition OR	4
IAS 23304	The Essay	4
SPAN 22504	Intermediate Spanish	4

Majors must also take 20 credits in an interdisciplinary concentration area, for a total of 32 credits (at least 20 must be completed in residence). Students select from the following interdisciplinary concentrations:

- Childhood Studies
- Disabilities Studies
- History, Politics and Society
- Literary, Media and Visual Arts
- Social Welfare
- Urban Studies and Public Administration
- The Americas (B.A./M.A. option)
- Global Labor Studies

Additional Degree Requirements

At least 32 credits must be earned in upper division courses. The last 30 credits must be earned in residence at the Department of Interdisciplinary Arts & Sciences. No more than 16 credits of the residency requirement may be met through a combination of independent study and life experience credits. An overall GPA of 2.0 is required to graduate with a B.A. in Interdisciplinary Arts and Sciences.

Autobiography and Life Experience Program

CWE offers two separate, unique experiences designed to award students college credit for previously learned knowledge.

Autobiography component:

Students take the Seminar in Autobiography which prepares them to write a 50-150-page Autobiography. After completing the Seminar, students can choose to work independently to write their Autobiographies. Two anonymous readers will then evaluate the Autobiographies. Students can earn up to a total of 8 Life Experience credits (tuition-free) for their Autobiographies.

Life Experience component:

Students take the online Life Experience Program workshop which is designed to introduce them to the requirements for petitioning for life experience credit and to help them develop a Life Experience Portfolio. Students examine their previous professional and/or volunteer experience to determine whether their previous work aligns with a college-level course. Following the workshop, students work with a mentor to complete their portfolios. Portfolios are then submitted for external review. Students can earn up to 12 Life Experience credits (tuition-free) for their Portfolios.

Study of the Americas, Bachelor of Arts/Master of Arts (B.A./M.A.)

The department offers a combined B.A./M.A. degree that enables outstanding students to complete both degrees in a shorter time period. For details see the Chair or the M.A. Program Director.

Early Childhood Education, Bachelor of Science (B.S.)

In connection with the School of Education, the Division offers a Bachelor of Science degree with a major in Early Childhood Education. In 2004, the ECE Program received accreditation from the National Council for the Accreditation of Teacher Education (NCATE).

The School of Education recommends graduates of the Undergraduate ECE Program for New York State Initial Teacher Certification in Early Childhood Birth through Second Grade.

The ECE Program's curriculum is designed to prepare knowledgeable, reflective, and caring educators who will be committed to teaching, participating, and leading in the life of diverse communities.

Admission to the Early Childhood Education Program

Students must apply and meet the following criteria:

- Pass the School of Education Admissions Test (S.E.A.T.)
- Complete at least 45 credits, including IAS 10000 (p. 73), IAS 10100 (p. 73), IAS 10400 (p. 73) or IAS 10500 (p. 73) (or their transfer equivalents), two social Sciences Courses: SOC 38144 (p. 125); EDCE 20604 (p. 46) and EDCE 20614 (p. 46) (or their transfer equivalents)
- Maintain a 2.8 grade point average
- Successfully complete an ECE Program admission interview with ECE faculty.

Student Teaching

The application for student teaching must be submitted one semester prior to student teaching placement. To be approved for student teaching, students must have:

- A recommendation from their advisor
- Completed all requirements in the core and the co-major, and requisite education courses with grades of "C" or higher
- Maintained a GPA of 2.8 or higher

- Completed 100 hours of field experiences
- As a candidate for New York State Initial Certification in Early Childhood Education, students must be prepared to fulfill a minimum of 300 hours of supervised student teaching

Completion of the B.S. Degree

- Students must declare an Interdisciplinary Liberal Arts and Sciences co-concentration (see above).
- A 2.8 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

Initial New York State Teacher Certification

The City College will recommend the candidate for NYS Initial Certification once the following requirements are successfully fulfilled:

- Academic Literacy skills test (ALST)
- Educating All Students (EAS)
- Educational Teacher Performance Assessment (EdTPA)
- Content Specialty Test (CST)
- Child Abuse Identification and Violence Prevention Certificates
- Dignity for All Students Act Training (DASA)

B.S. Degree Requirements Early Childhood

CWE Pathways Requirements (42 credits)

CWE has been granted a waiver from the CUNY Office of Academic Affairs to offer a 40-credit Pathways General Education curriculum that integrates both the Pathways Common Core and the College Option. Students will take ten four-credit courses that fulfill all the areas of the Required and Flexible Core and the College Option, with some adjustments for transfer students.

Required Core

English Composition

IAS 10000	Writing for Interdisciplinary Studies I	4
IAS 10100	Writing for Interdisciplinary Studies II	4

Mathematics and Quantitative Reasoning:

MATH 15000	Mathematics for the Contemporary World	3
	OR	
MATH 18000	Quantitative Reasoning	3

Life and Physical Sciences:

IAS 10400	Nature & Human Beings I	4
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Flexible Core

World Cultures and Global Issues (students must take two courses in this area)

SPAN 12104	Intro Spanish I	4
SPAN 12204	Intro Spanish II	4

**For students with a foreign language exemption, see below.*

U.S. Experience in its Diversity:

HIST 12404		
	OR	
PSC 10104	U S Politics & Govt	4

Creative Expression:

ART 29104	Women in World Art	4
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Individual and Society:

IAS 31292	Intro Urban Stud Pla	4
	OR	

SOC 38144	School and American Societies/Sociology of Education	4
	OR	
PSY 10204	Psychology in the Modern World	4

Scientific World:

IAS 10500	Nature and Human Beings II	4
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College Option for transfer students without an Associate's Degree

SPAN 12104	Intro Spanish I	4
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SPAN 12204	Intro Spanish II	4
	OR	
	Approved World Cultures and Global issues substitute if language requirement met (see advisor for details)	

SPAN 22300	Intermediate	2
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College Option for transfer students with an Associate's Degree

SPAN 12104	Intro Spanish I	4
	OR	
	Approved World Cultures and Global issues substitute if language requirement met (see advisor for details)	

Content Core: Liberal Arts co-concentration: (32 credits)

Early Childhood Required Courses

MATH 18000	Quantitative Reasoning	3
MATH 18504	Basic Ideas in Mathematics	4
SPCH 11104	Speech Foundations	4

Majors' Courses

EDCE 20604	Theories of Development Applied to Early Childhood Practice	4
EDCE 20614	Early Childhood: Development, Assessment, and Pedagogy in Inclusive Settings	4
EDCE 32304	Language Development and Emergent Literacy I	4
EDCE 32204	How Children Learn Math	4
EDCE 40200	Language Development and Early Literacy II	2
EDCE 40300	Social Studies in Early Childhood Settings	2
EDCE 22100	School, Family, Community	2
EDCE 40500	Facilitating Children's Artistic Development	2
EDCE 40600	Facilitating Children's Musical Development	2
EDCE 31904	Science in Early Childhood Settings	2
EDCE 40800	Student Teaching and Integrative Seminar in Early Childhood Education	6
EDCE 41900	Professional Development Seminar	0
EDCE 32001	edTPA Seminar	0

Subtotal: 46

EDCE 20604, EDCE 20614, EDCE 32304, EDCE 32204: 15 hours fieldwork

EDCE 40200, EDCE 40300: 10 hours fieldwork

EDCE 22100, EDCE 40500, EDCE 40600, EDCE 31904: 5 hours fieldwork

EDCE 40800: 300 hours

Advisement

Students should review their program planning sheet with their advisor during their pre-registration appointment to select courses. Students accepted into the program must meet with the Early Childhood Program Coordinator for advisement and registration.

ECE: Maintenance of Matriculation

As a professional school with the responsibility of recommending students for New York State certification, faculty of the Early Childhood Education Program must conduct ongoing professional assessment of all students. In cases where a faculty member determines that an individual is inappropriate for the teaching profession he/she may recommend removal from the teacher preparation program to the chair of the department. The student has the right to appeal to the Committee on Course and Standing. The findings of the Committee are final.

For additional requirements please see School of Education Undergraduate Programs (p. 236) in this catalog.

Advisement

Students should review their advising worksheet with their advisor during their preregistration appointment to select courses. Students accepted into the program must meet with the Early Childhood Program Manager for advisement and registration.

Faculty

Carlos Aguasaco, Associate Professor

B.A., National University of Colombia; M.A., CCNY, Ph.D., Stony Brook University

Alessandra Benedicty-Kokken, Associate Professor

B.A., University of California, Santa Barbara; D.E.A., University de Paris IV-Sorbonne; M.A., Ph. D., University of Wisconsin, Madison

Marlene Clark, Associate Professor

B.A., Ramapo College; M.A., Stony Brook University; Ph.D., The Graduate Center, CUNY

David Eastzer, Assistant Professor

B.S., Cornell University; M.S., CCNY; Ph.D., University of North Carolina (Chapel Hill)

Vicki Garavuso, Associate Professor

B.A., Lehman College; M.S., M.Ed., Bank Street College of Education; Ed.D., Teachers College, Columbia University

Mary E. Lutz, Lecturer

B.S., Columbia University; M.S., Hunter College; D.S.W., Columbia University

Elizabeth A. Matthews, Assistant Professor

B.A., New York University; M.A., M.Phil., Columbia University; Ph.D., The Graduate Center, CUNY

Kathlene McDonald, Associate Professor and Chair

B.A., Colgate University; M.A., SUNY (Binghamton); Ph.D., University of Maryland

Susanna Rosenbaum, Assistant Professor

B.A., Wesleyan University; M.A., Ph.D., New York University

Seamus Scanlon, Librarian

HDipEd, University College Galway, Ireland; MLS University of West London; MFA, City College

Susanna F. Schaller, Assistant Professor

B.A., Barnard College; M.A., MCRP, University of New Mexico; Ph.D., Cornell University

Justin C. Williams, Assistant Professor

B.A., Columbia College, MO; M.A., Ph.D. Stony Brook University

Martin V. Woessner, Associate Professor

B.A., University of San Francisco; Ph.D., The Graduate Center, CUNY

International Studies Program

(The Colin Powell School for Civic and Global Leadership, formerly the Division of Social Science)

Dean Vincent Boudreau, Interim Director • Program Office: NA 6/293 • Tel: 212-650-5844

General Information

The City College offers the following undergraduate degree in International Studies:

B.A. (p. 199)

Programs and Objectives

The International Studies program is an interdisciplinary program in which students may specialize in one of the following areas:

- International Relations
- International Public Policy
- Culture and Communication
- Development

Students may also select International Studies as one major in a double major.

International Studies is an appropriate major for those seeking an internationally oriented career in either the public or private sector. The B.A. in International Studies can qualify students for entry-level positions in branches of the U.S. government, multinational corporations and Non-Governmental Organizations (NGOs), although an appropriate master's degree is recommended. International agencies in the private sector recruit students who have acquired both a broad liberal arts education and specialized skills during their undergraduate years. Employment possibilities also exist in private and international organizations concerned with social issues such as the protection of human rights or the development of Third World countries, as well as with institutions involved in research and philanthropy.

Opportunities for financial support for study abroad, service learning, internships and international research are available to students in the program.

Internships

As juniors and seniors, students are eligible to participate in internships in diplomatic missions to the United Nations, international businesses, research institutes, non-governmental organizations and other arenas of international issues. Interns normally spend up to ten hours per week in their on-the-job activities, meet with fellow interns at the College, and regularly consult a faculty supervisor. Interns learn about the policies of an international agency, as well as contribute to its operations.

International Studies Program, Bachelor of Arts (B.A.)

Requirements for Majors

Required Courses

INTL 20100	International Studies: A Global Perspective	3
INTL 30500	Social Foundations of International Studies	3
ENGL 21002	Writing for the Social Sciences	3

One of the following theory courses (or other course with approval): (3 credits)

ANTH 20100	Cross-Cultural Perspectives	3
INTL 31108	Transnational Feminism	3
PSC 20200	Comparative Political Economy	3
PSC 25200	Theories of International Relations	3

One of the following quantitative skills courses: (3-4 credits)

ECO 20150	Principles of Statistics	4
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INTL 31107	Rsch Mthds Intl Stds	3
PSY 21500	Applied Statistics	4
SOC 23200	Methods and Techniques of Sociological Research	4
INTL 25100-25200	Internship in International Studies	3

One of the following capstone classes: (3 credits)

INTL 32100	Senior Seminar in International Studies	3
INTL 32200	Senior Essay in International Studies	3

Advanced electives: (15 credits)

[Students choose one from the list of four concentrations in the introductory text above and then select five courses from at least three different departments within that concentration.]

Subtotal: 42-43

Senior Honors Option

The Honors Senior Thesis (INTL 30200) is the capstone courses of the International Studies Program for students who wish to graduate with Honors. This class may be substituted for the Senior Thesis (INTL 32200) course.

Overseas Study

Students (with prior approval of the Program Director) may earn up to fifteen credits toward their major through overseas study and may also be exempted from the requirement of a third year of foreign language.

General Information

A 2.5 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Elective Courses

The college offers a variety of courses that are acceptable toward the elective requirements of this major. A list of such courses is prepared each semester and is available in the program office before registration begins. If you have a question about the acceptability of a course that does not appear on the list, please contact the program office. Failure to receive permission to take courses not appearing on the list may result in that course failing to count toward the graduation requirements.

Advisement**Program Director**

Ms. Johanna Ureña
(212) 650-5844

Program Resources

All IS majors receive individual advising from the Program Director each semester prior to registration and as opportunities develop for participation in study abroad, national seminars, fellowships and scholarships.

International Studies Majors are eligible for fellowships administered by the Program to support study abroad.

The Model United Nations Program is popular among IS majors who constitute the majority of its participants; students also participate in other Model United Nations simulations.

The Students Association of International Studies (SAIS), run by students in the Program (but open to non-majors as well), organizes guest lectures, international crisis simulations, cultural fairs, publishes a

blog and other social media resources, and offers opportunities for leadership among students.

When time permits, IS majors are provided training in cross-cultural mediation; this is a valuable skill which prepares them for the challenges they will encounter in their careers.

NA 6/293 is also a lounge where IS students may meet and study.

Faculty

The faculty of the program includes those professors who teach the program's courses and those whose departmental courses may be credited to the major.

James J. Biles, Associate Professor
B.S.S., Ohio Univ.; M.A., Ph.D., Michigan State

Rajan Menon, Spitzer Professor
B.A., St. Stephen's College, Delhi Univ. (India); M.A., Lehigh Univ.; Ph.D. Univ. of Illinois

Maritsa Poros, Associate Professor
B.A., Goucher College; M.A., Columbia Univ., M.Phil., Ph.D.

Irina Carlota (Lotti) Silber, Associate Professor and Chair

B.A., George Washington Univ.; Ph.D., New York University

Jewish Studies Program

(Division of Humanities and the Arts)

Professor Roy Mittelman, Director • Program Office: NA 5/202 • Tel: 212-650-7522

General Information

The City College offers the following undergraduate degree in Area Studies:

B.A. (p. 200)

Programs and Objectives

Jewish Studies offers a wide range of courses that examine the literature of the Jews, their history, philosophy, mysticism, sociology, and nationalism.

The Program in Jewish Studies is developing a series of courses to explore the links of American Jews to other ethnic minorities and speak to the vitality of Jewish culture from antiquity to the present. In cooperation with other departments in Humanities and the Arts, Jewish Studies courses, seminars and lectures will speak to the role of minority cultures in shaping and reacting to national identity. A major concern of Jewish Studies is the study of ethics in society, art and literature. In particular, Jewish Studies will address the philosophical, political and religious questions posed by racism and genocide in present and past centuries.

The Program coordinates a study abroad program for undergraduates and graduates at Tel Aviv University and Ben Gurion University. Financial assistance is available to qualified students.

Jewish Studies: Area Studies, Bachelor of Arts (B.A.)**Requirements for Majors**

Students are urged to acquire an elementary knowledge of Hebrew. It is not a requirement of the program but study of the language makes it possible to do independent scholarly research. Although there are presently no course offerings in the study of the Yiddish language, tutorials can be arranged for those interested.

Students majoring in Jewish Studies, in addition to maintaining a cumulative GPA of 2.0 or higher, must complete the following:

Required Courses

JWST 10000 Introduction to Jewish Life and

	Religion	
HEB 12100	Elementary 1	3
HEB 12200	Elem 2nd Year	3

Elective Courses (21 credits)

All courses to be chosen in consultation with the program advisor
Subtotal: 30

Recent faculty in Jewish Studies have included Elie Wiesel, Rabbi Irving Greenberg, H. Z. Szubin, Rabbi Meyer Fund, and Paul Ritterband. Distinguished Jewish writers like Harold Brodkey, Cynthia Ozick, Grace Paley, Jakob Lind, Joseph Heller and Barbara Solomon have also taught in Humanities and the Arts Division on the City College campus.

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Jewish Studies Minor**Requirements for Minors**

Students who choose to minor in Jewish Studies must complete the following:

Required Courses

Elective Courses (12 credits)

Students must select four electives that the Director approves as Jewish Studies courses. Only one of these courses may be related to film.

Total Credits 12

Advisement

Students wishing to major in Jewish Studies should consult Professor Roy Mittelman; NA 5/202; 212-650-7522

Faculty

Elazar Elhanan
B.A., University of Paris, St. Denis; M.A., Ph.D., Columbia University

Abby Kornfeld
B.A., Cornell; M.A., Ph.D., New York University

Amy Kratka
B.A., Queens College; M.A., Ph.D., Boston University

Roy Mittelman
B.A., University of Pennsylvania; M.A., Ph.D., Temple University

Latin American and Latino Studies Program

(The Colin Powell School for Civic and Global Leadership, formerly the Division of Social Science)

Professor Sherrie Bayer, Director • Program Office: NA 6/108 • Tel: 212-650-7497

General Information

The City College offers the following undergraduate degree in Area Studies:

B.A. (p. 201)

Programs and Objectives

Students examine the histories and contemporary civilization of the Spanish-speaking Caribbean and Latin American region as well as the role of colonization, modernization and globalization, in the nation-building and identity formation experiences of its people. Courses also explore the diversity and of Caribbean and Latin American cultures, their shifting economics, geopolitics and multi-racial societies. Courses also

explore the historical role of Latin American-US immigration and the contribution of these Diasporas to the US and to the nations of origin. Students also receive the necessary skills to obtain employment or enter graduate schools to pursue advanced degrees in anthropology, economics, history, political science, sociology, ethnic studies, international studies, law and international law, Latin American studies, social work, bilingual education, health and other disciplines.

To permit students to complement their education in other majors with a knowledge of Latin America and the Latino communities of the U.S., the program also offers a minor in Latin American and Latino Studies.

The following list of courses should be viewed as a helpful guide but not the only courses offered each semester that are relevant for Latin American and Latino Studies. Students majoring or minoring in LALS should consult with the Program Director and the Schedule of Classes each semester.

Latin American and Latino Studies: Area Studies, Bachelor of Arts (B.A.)

Requirements for Majors

Students must complete the following:

Required Courses (2)

LALS 10100	The Heritage of the Spanish Antilles	3
	OR	
LALS 10200	Latin American and Caribbean Civilizations	3
	AND	
LALS 12600	Hispanics in the United States: Migration and Adjustment	3

Electives (24 credits)

At least eight additional courses from the following list (additional courses may be accepted in consultation and approval of the program director)

Any course with a LALS designation including LALS 31000: Independent Study

HIST 28200	Modern and Contemporary Latin America	3
PSC 23600	Political Systems of Latin America	3
SPAN 44600	Literature of the Spanish Caribbean	3
WS 31894	Latinas in Transition	4

Subtotal: 30

While students may choose to have a disciplinary concentration within LALS, no more than four courses in any particular discipline (e.g., Anthropology, History, etc.) may be credited toward that concentration.

Grade Point Average Requirements

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Latin American and Latino Studies Minor

Requirements for Minors

Students wishing to complement their learning in other majors with a knowledge of Latin America and the Latino community in the U.S. may minor in LALS.

Required Courses

One introductory Latin American History/civilization/heritage course	3
Four electives	12

Subtotal: 15

Elective Courses in Other Departments

The College offers a wide variety of courses that are acceptable toward the elective requirements of this major. A list of such courses is prepared each semester and is available in the program office before registration begins. If you have a question about the acceptability of a course that does not appear on the list, please contact the program office. Failure to receive permission to take courses not appearing on the list may result in that course failing to count toward the graduation requirements.

Faculty

The faculty of the program includes those professors who teach the program's courses and those whose departmental courses may be credited to the major.

Department of Mathematics

(Division of Science)

Martin and Michele Cohen Professor Michael Shub, Chair •
Department Office: NA 8/133 • Tel: 212-650-5346

General Information

The City College offers the following undergraduate degrees in Mathematics:

B.A./B.S. in Mathematics (p. 202)

Programs and Objectives

The Mathematics Department offers programs of study that enable students to prepare for graduate study in pure and applied mathematics, and careers in industry and education. Majors choose to specialize in one of the following areas:

- Mathematics
- Math in Scientific & Industrial Applications
- Secondary School Education

Students enrolled in major programs in other departments can obtain a Minor in Mathematics by completing the requirements listed below.

Honors

Students planning to attend graduate school in mathematics are urged to apply for admission to the department Honors Program, which may lead to a degree with honors. Candidates should see the departmental Honors Advisor no later than the beginning of their junior year to plan a program of study.

Mathematics, Bachelor of Arts or Science (B.A./B.S.)

Requirements for Majors

A GPA of 2.0 or higher in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

All Mathematics majors must make a 10-minute oral presentation of a mathematical topic and receive a passing grade based on a faculty evaluation.

Foundational courses for the Math program must be completed before embarking upon related courses in the major. Students with appropriate background as demonstrated by the College's Placement Exam may be exempted from some or all Foundational Courses. The foundational course for Calculus I (MATH 20100) is Pre-Calculus (MATH 19500), and this course must be passed with a grade of C or higher in order to proceed to the next level.

Mathematics (B.A. or B.S.)

In addition to completing the calculus sequence (MATH 20100, MATH 20200 and MATH 20300), students must complete a minimum of eight courses of mathematics including the following:

Required Courses

MATH 30800	Bridge to Advanced Mathematics	3
MATH 32300	Advanced Calculus I	4
MATH 32404	Advanced Calculus II	4
MATH 34600	Elements of Linear Algebra	3

One of the following: (4 credits)

MATH 34700	Elements of Modern Algebra	4
MATH 44900	Modern Algebra I	4

Elective Courses

Students must choose three additional courses to complete the eight course minimum requirement from among the following: (9-12 credits)

MATH 32800	Methods of Numerical Analysis	3
MATH 34500	Theory of Numbers	3
MATH 36000	Introduction to Modern Geometry	3
MATH 36500	Elements of Combinatorics	4
MATH 37500	Elements of Probability Theory	4
MATH 37600	Mathematical Statistics	4
MATH 39100	Methods of Differential Equations	3
MATH 43200	Theory of Functions of a Complex Variable I	4
MATH 43400	Theory of Functions of a Real Variable I	4
MATH 43500	Partial Differential Equations I	4
MATH 44300	Set Theory	4
MATH 44400	Mathematical Logic	4
MATH 46100	Differential Geometry	4
MATH 46300	Topology I	4
MATH 47700	Stochastic Processes I	4
MATH 47800	Advanced Mathematical Statistics	4
MATH 51100	Selected Topics in Pure Mathematics	4
MATH 51200	Selected Topics in Classical Analysis	4
MATH 51300	Selected Topics in Probability, Statistics, and Operations Research	4

Additional Requirements

Students are also required to fulfill a minor concentration of two advanced courses with mathematical content from an allied discipline (e.g., Physical Sciences, Computer Science, Philosophy, Economics or Engineering) to be approved by the Assistant Chair.

Subtotal: 27-30

Math in Scientific & Industrial Applications (B.S.)

In addition to the Calculus sequence MATH 20100, MATH 20200, MATH 20300, students must complete eight required courses plus one of the specialization options.

Required courses

MATH 32800	Methods of Numerical Analysis	3
MATH 34600	Elements of Linear Algebra	3
MATH 36500	Elements of Combinatorics	4
MATH 36600	Introduction to Applied Mathematical Computation	3

MATH 37500	Elements of Probability Theory	4
MATH 37600	Mathematical Statistics	4
MATH 37700	Applied Statistics and Probability	3
MATH 39100	Methods of Differential Equations	3

Option 1: Statistics

MATH 47800	Advanced Mathematical Statistics	4
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Option 2: Financial Mathematics

MATH 38100	Discrete Models of Financial Mathematics	3
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MATH 38200	Continuous Time Models in Financial Mathematics	3
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Subtotal: 31-33

Secondary School Education (B.A. or B.S.)

In addition to completing the calculus sequence (MATH 20100, MATH 20200 and MATH 20300), students must complete the major requirements listed below. All Secondary Mathematics majors must take and pass the New York Content Specialty test before graduation. Pedagogical requirements for NYS certification are listed in the School of Education section (p. 236) of this *Bulletin*.

Required Courses

MATH 30800	Bridge to Advanced Mathematics	3
MATH 32300	Advanced Calculus I	4
MATH 34500	Theory of Numbers	3
MATH 34600	Elements of Linear Algebra	3
MATH 36000	Introduction to Modern Geometry	3
MATH 37500	Elements of Probability Theory	4

One of the following two: (4 credits)

MATH 34700	Elements of Modern Algebra	4
MATH 44900	Modern Algebra I	4

Two of the following: (6-8 credits)

MATH 32404	Advanced Calculus II	4
MATH 32800	Methods of Numerical Analysis	3
MATH 34200	History of Mathematics	3
MATH 36500	Elements of Combinatorics	4
MATH 37600	Mathematical Statistics	4
MATH 38100	Discrete Models of Financial Mathematics	3
MATH 38200	Continuous Time Models in Financial Mathematics	3
MATH 39100	Methods of Differential Equations	3

Subtotal: 29-31

Additional Requirements**General Education Requirements ("Pathways")**

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements (Pathways) (p. 286) section of the Bulletin for more information. Mathematics students will satisfy their "Pathways" requirements most efficiently by following these recommendations:

Fixed Core**English Composition I:**

FIQWS	Freshman Inquiry Writing Seminar	6
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English Composition II:

ENGL 21003	Writing for the Sciences	3
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Mathematical and Quantitative Reasoning:

MATH 20100	Calculus I	3
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Life and Physical Sciences:

BIO 10100	Biological Foundations I	4
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BIO 10200	Biological Foundations II	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
EAS 10600	Earth Systems Science	4
EAS 22700	Structural Geology	4
PHYS 20400	General Physics II	4
	OR	
PHYS 20700	University Physics I	4

Flexible Core**World Cultures and Global Issues:**

any CLAS offerings in this category

Individual and Society:

any CLAS offerings in this category

U.S. Experience in its Diversity:

any CLAS offerings in this category

Creative Expression:

any CLAS offerings in this category

Scientific World:

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
EAS 10600	Earth Systems Science	4
EAS 22700	Structural Geology	4
PHYS 20400	General Physics II	4
	OR	
PHYS 20700	University Physics I	4

Additional course in Scientific World:

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
EAS 10600	Earth Systems Science	4
EAS 22700	Structural Geology	4
PHYS 20400	General Physics II	4
	OR	
PHYS 20700	University Physics I	4

College Option**Speech**

SPCH 11100	Foundations of Speech Communication	3
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SPCH 00380

*or exemption on the basis of demonstrated proficiency***Foreign language**

two semesters of college-level study, or exemption on the basis of two years of high-school level study, or demonstrated proficiency

Philosophy

any CLAS offerings in this category

Mathematics Minor**Requirements for the Minor**

Students enrolled in major programs in other departments can also obtain a minor in Mathematics by completing the following requirements:

Required courses

A calculus sequence through MATH 20300

A total of twelve credits at the City College in 3000-level courses (excluding 30500), which includes one of the following:

MATH 34600	Elements of Linear Algebra	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3

Electives for Non-Majors

Students wishing to take courses beyond 20300 are advised to consult with the Assistant Chair on the selection of appropriate courses.

Advisement

Assistant Chair, Major Advisor

Professor Joseph Bak
NA 8/133; 212-650-5175

Undergraduate Advisor

Mr. Chun Sae Park
NA 8/133; 212-650-5105

Graduate Advisors

Professor Christian Wolf
NA 6/274; (212) 650-5118

Professor Benjamin Steinberg
NA 8/134a; 212-650-5482

Assistant Chair, Honors Supervisor

Professor Thea Pignataro
NA 6/202b; 212-650-5157

Artino Computer Laboratory Supervisor and Placement Advisor

Mr. Mark Turner
NA 6/272; 212-650-5229

Tutoring

The Mathematics Help Desk (MR 418S) offers free tutoring in courses from the elementary level through calculus and differential equations.

Exemption Credit

Students can earn exemption credit in any Mathematics course by taking an exemption examination arranged by the Assistant Chair's office. Exemption from the course is awarded for a grade of 70 or above; credit is granted for a grade of 80 or above. Students who have registered for a course or who have previously failed an exemption examination in a course may not take an exemption examination for that course. The Mathematics Department awards credit for the College Board Advanced Placement Examinations according to the following:

- AP Calculus (AB) score 4 or 5; credit for MATH 20100 or MATH 20500
- AP Calculus (BC) score 4 or 5; credit for MATH 20100 and MATH 20200 or MATH 20500
- AP Calculus (BC) score 4; credit for MATH 20100 or MATH 20500
- AP Statistics; score of 4 or higher; credit for MATH 17300

Departmental Activities

The Mathematics Club is open to mathematics majors as well as other student mathematical enthusiasts. The club plans and organizes lectures, discussions and social functions.

The Mathematics Colloquium meets regularly for talks by invited guests as well as Department faculty.

Various seminars meet regularly and discuss selected topics in mathematics.

Awards and Scholarships

The Mathematics Department awards several medals, prizes and scholarships to outstanding students.

The Belden Medal

To the student or students who complete the Advanced Calculus sequence with distinction.

The Emil L. Post Memorial Award

To the graduating senior or seniors judged most promising in Mathematics.

The Dr. Barnett and Jean Hollander Rich Mathematics Scholarships

Awarded annually to talented and needy undergraduates who have demonstrated superior ability in mathematics and who are preparing for careers in mathematics or math related fields.

Faculty

Ethan Akin, Professor
B.S., CCNY; Ph.D., Princeton Univ.

Asohan Amarasingham, Associate Professor
B.S. Univ. of Virginia; M.S., Ph.D. Brown Univ.,

Matthew Auth, Doctoral Lecturer
B.A., Brandeis Univ.; Ph.D., Univ. of Massachusetts

Joseph Bak, Associate Professor
B.A., Yeshiva Univ., M.A., Ph.D.

Khalid Bou-Rabee, Assistant Professor
B.A., Rice Univ., Ph.D., Univ. of Chicago

Shirshendu Chatterjee, Assistant Professor
B.S., M.S. Indian Stat. Inst., Ph.D., Cornell Univ.

Gautam Chinta, Professor
B.S., Yale Univ.; Ph.D., Columbia Univ.

Sean Cleary, Professor
A.B., Cornell Univ.; Ph.D., Univ. of California (Los Angeles)

Zajj Daugherty, Assistant Professor
B.S., Harvey Mudd College, M.A., Ph.D. Univ. of Wisconsin-Madison

Blair Davey, Assistant Professor
B.Math, Univ. of Waterloo, M.S., Ph.D. Univ. of Chicago

Brooke Feigon, Associate Professor
B.S. Stanford Univ.; M.A., Ph.D. Univ. of California (Los Angeles)

Jack Hanson, Assistant Professor
B.S. Rutgers Univ., Ph.D. Princeton Univ.

W. Patrick Hooper, Assistant Professor
B.S., Univ. of Maryland (College Park), M.A.; Ph.D., SUNY (Stony Brook)

Jay Jorgenson, Professor
B.S., Univ. of Minnesota; M.S., Stanford Univ., Ph.D.

Tamara Kucherenko, Assistant Professor
Dipl., Kharkov National Univ.; Ph.D., Univ. of Missouri

Alice Medvedev, Assistant Professor
Ph.D. Univ. of California (Berkeley)

Sergiy Merenkov, Professor
M.S. Kharkov State Univ., Ph.D. Purdue Univ.

Stanley Ocken, Professor
A.B., Columbia Univ.; M.A. Princeton Univ., Ph.D.

Chun Sae Park, Lecturer
B.S., CCNY, M.A.

Thea Pignataro, Associate Professor
B.S., Polytechnic Inst. of New York; M.A., Princeton Univ., Ph.D.

Rochelle Ring, Associate Professor
B.S., CCNY; M.S., New York Univ., Ph.D.

Bianca Santoro, Associate Professor

B.S., Pontificia Universidade Católica do Rio de Janeiro, M.S.; Ph.D., M.I.T.

Vladimir Shpilrain, Professor
M.A., Moscow State Univ., Ph.D.

Michael Shub, Martin and Michele Cohen Professor
Ph.D Univ. of California (Berkeley)

Benjamin Steinberg, Professor
B.A. Rice Univ.; Ph.D. Univ. of California (Berkeley)

Christian Wolf, Professor
Dipl.-Math., Univ. of Munich; Ph.D, Technical Univ. of Munich

Professor Emeritus

Jack Barshay

Gilbert Baumslag

Mark Brown

Isaac Chavel

Harvey Cohn

Morton Davis

Michael Engber

Jacob Eli Goodman

Edward Grossman

Alberto Guzman

Raymond Hoobler

Karel Hrbacek

Ralph Kopperman

John Landolfi

Jonah Mann

Michael Marcus

Jack Miller

Niel Shell

William Sit

Fred Supnick

Norman Wagner

Department of Media and Communication Arts

(Division of Humanities and the Arts)

Professor Jerry Carlson, Chair • Department Office: SH 472 • Tel: 212-650-7167

General Information

The City College offers the following undergraduate degrees in Media and Communication Arts:

B.A. in Communications (p. 205)

B.F.A. in Film and Video (p. 206)

Programs and Objectives

Established in 1984, the Department of Media and Communication Arts combines history, theory, and critical analysis of the media with hands-on practical experience. This liberal-arts based, professionally-oriented department offers a broad education in media studies and writing and research in media studies with concentrations in the following:

Advertising and Public Relations (B.A.) (p. 205)

Film and Video Production (B.F.A.) (p. 206)

Journalism (Minor) (p. 207)

Cinema Studies (Minor) (p. 208)

Advertising and Public Relations: Communications Bachelor of Arts (B.A.)

Advertising and Public Relations

The Advertising/Public Relations program offers a competitive professional communications education. Students must apply to be accepted to this major. In addition to providing a rigorous curriculum which explores current theories in integrated marketing, advertising, corporate communications, public relations, and communications management, the Ad/PR Program is dedicated to delivering the sort of practical knowledge and hands-on experiences which students can only get by studying in New York City, the communications capital of the world.

Students are introduced to the techniques of writing and producing campaigns that market an idea, service, product or institution to specific audiences and stakeholders. Emphasis is on market research and measurement, strategic planning, and ethical execution of advertising and public relations campaigns through print, broadcast, Internet and social media.

While students have hands-on experience in creating their own advertising and public relations campaigns, research, writing, critical analysis skills and presentation skills are strongly emphasized in all classes.

In the senior workshop, students create an integrated communication campaign for an actual client and graduate with a professional portfolio of their work in advertising and public relations.

The Department strongly encourages its majors to apply for one or two internships, particularly in the senior year. Developed specifically for Media and Communication Arts majors, the internship program places students in a wide variety of well-known and respected agencies, firms and corporations. Students can receive up to six credits for their internship experiences.

The Department hosts student member chapters of the American Advertising Federation (AAF) and Public Relations Society of America (PRSSA). We receive scholarships and fellowships annually from professional organizations.

Graduates frequently pursue entry-level positions in advertising and public relations agencies as junior account executives, publicity assistants, media buyers, and in institutions and corporations as public relations representatives, special events coordinators or market research assistants to name a few. Others pursue graduate study in writing, design, marketing and business management.

Advertising/Public Relations Admission Requirements

Admission to the B.A. in Communications requires students to be admitted to CCNY, or to be in the process of being admitted to CCNY. Students are accepted to the major in both Fall and Spring semesters. Approximately 50 students are accepted each semester.

Students may apply for the major during their sophomore year.

Students must meet the following requirements to be a competitive for the Ad/PR program:

- Complete MCA 10100: Introduction to Media Studies with a grade of B- or better.
- Students may also take MCA 10100 the semester before they plan to enter the major. Students must demonstrate a track record of success during the first 6 weeks of the semester, if they plan to apply to the program for admission in the following semester.
- Students must have a minimum GPA of 2.5. It is essential to have basic mastery of English grammar and syntax, and the ability to organize ideas clearly and logically. Writing is an essential part of this major.
- Students must have completed at least 45 credits by the time they enter the major.

- Students must write a 250-word statement about their interest in the Ad/PR major and/or profession.

Transfer Students

Transfer students must meet the same criteria as above.

Transfer students who have been accepted to CCNY should meet with an Ad/PR academic advisor before applying to the Ad/PR program. At that meeting, students should bring a transcript and course descriptions of any courses that may be equivalent to Ad/PR major requirements.

Students who have taken a Mass Communications course (MCA 10100 equivalent) at another school will need to bring additional writing samples to demonstrate writing proficiency.

Students should apply to the Ad/PR major in the semester prior to the one they plan to take major classes. The application form is available online at www.ccnycuny.edu under the Ad/PR Program or from Shepard 472. Deadlines for application are posted each semester.

Requirements for All Majors

The following requirements apply to all students entering the College in the Fall 2009 semester or thereafter. Currently enrolled students are subject to the requirements in effect when they declared their major. Students reentering the college or transferring from other institutions with credits in the major should consult the appropriate Program Director for applicability of those courses to the current requirements.

A 2.5 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.5 and above to graduate with a degree from the Department of Media & Communication Arts.

Requirements for the B.A. in Advertising and Public Relations

Program Director: Prof. Lynn Appelbaum

All majors in the B.A. in Advertising and Public Relations must maintain a minimum overall G.P.A. 2.5 and a minimum 2.5 G.P.A. in the Ad/PR specialization to remain in the major.

Required Courses

Note: MCA 10100 (3 cr.) is the prerequisite to all B.A. courses.

MCA 20900	Introduction to Public Relations	3
MCA 21000	Introduction to Advertising	3
MCA 35000	Corporate Communications	3
MCA 36000	Marketing Research	3
MCA 36200	Public Relations Writing	4
MCA 36300	Advertising Copywriting	4
MCA 37500	Advertising Management I	3
MCA 37600	Advertising Planning	3
MCA 40100	Ethics and Values in Communication	3
MCA 46800	Advertising and Public Relations Workshop	4

Electives: (3 credits)

MCA 21100	Advertising and Public Relations Production	3
MCA 23300	Introduction to Journalism	3
MCA 36500	Social Media Strategies	3
MCA 36700	Entrepreneurship for Media Studies	3
MCA 36800	Media Planning	3
MCA 37400	Event Planning	3
MCA 29900	Internship in Communications I	1-6
MCA 39900	Internship in Communications II	1-6

Subtotal: 36

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Film, Bachelor of Fine Arts (B.F.A.)

Film and Video

The mission of the B.F.A. Film & Video program is to teach the art and craft of filmmaking, explore the history and theory of film and video, and to provide intensive hand-on experience utilizing the latest technology in fiction and documentary media production. Embedded in a Liberal Arts academic environment, the program nurtures students to discover their own creative voice and provides them with the knowledge and diverse skills to enter an ever-changing media world, or to continue their studies in a graduate program.

Program Description

First established in 1941 as Masters Institute of Film Techniques, the Film & Video program in the Department of Media & Communication Arts at CCNY is one of the oldest film programs in the country. It is the only undergraduate program in the CUNY system to offer a B.F.A. degree in Film & Video.

The B.F.A. in Film & Video program provides a broad range of fundamental production skills in the areas of fiction and documentary media production. Courses in screenwriting, production, and editing prepare students to produce their own projects in digital video. In addition to production courses, students must also take courses in history, theory, and aesthetics of film to compliment and contextualize the production skills they learn. The program's emphasis is on single camera fiction and documentary field production.

Admission

Admission to the B.F.A. in Film & Video program requires students to be already admitted or in the process of being admitted to CCNY. For students who have not yet been admitted to CCNY, application forms to the College are available through the Office of Admissions, Wille Administration Building, A-100, 212-650-6977.

Students must apply separately to the B.F.A. program through a second application process. Applications forms to the B.F.A. program are available in the Department of Media & Communication Arts, SH 472, 212-650-7167 or online at www.ccnycuny.edu/prospective/humanities/mca.

Twenty-five students are admitted to the B.F.A. program each year with the program of study beginning in the fall semester. Students must apply in the spring semester preceding the fall semester they wish to start. Most students apply during their sophomore year; the program does not accept first semester freshmen. In addition, you must have completed, or be in the process of completing, MCA 10100, MCA 10500, and MCA 12100 when applying to the program.

Transfer students should take special care in coordinating their transfer to the College, applying to the B.F.A. program, and satisfying the pre-requisite courses mentioned above. Students should first get a transcript evaluation of their general education courses done through the academic advisors in the Division of Humanities and Arts, NA 5/225, 212-650-8166. Those transferring from another film and video program or having taken courses related to media, must then get their course work evaluated through the academic advisors of the B.F.A. program in MCA. This is to determine if any transfer credits can be applied to the three pre-requisite courses or for any other course in the B.F.A. curriculum.

Admissions Criteria and Creative Portfolio

Students are evaluated and admitted to the program based on 4 criteria:

- Creative Portfolio*
- One page Personal Statement
- A grade of "C" or better in MCA 10100, MCA 10500, and MCA 12100
- A 2.7 cumulative G.P.A.

*The creative portfolio should consist of film/video work that the student has had major creative input on. It should demonstrate basic technical ability and a sense of visual storytelling. Having a polished, professionally created project is not a criterion for the portfolio. The portfolio work can be established in several ways:

- Projects created in MCA 10500: Introduction to Media Production.
- Projects created at other colleges (transfer students).
- Projects independently produced outside of college.

Overview of the B.F.A. Program Projects

The B.F.A. degree in Film & Video requires a minimum of 54 credits, which includes the prerequisite courses MCA 10100, MCA 10500, and MCA 12100. The program of study starts each fall semester and is completed in a 4 semester, 2-year cycle. The department is not open during the summer although the program will occasionally offer a critical studies course during the summer session. Not all courses in the curriculum are offered every semester, and a student who misses or fails a course will be "out of sequence" and may have to wait for another year for the course to be offered again.

G.P.A. – Students are required to maintain a 3.0 G.P.A. within the major to remain matriculated in the program. Transcripts are reviewed at the end of every semester by the B.F.A. advisors to determine your G.P.A. and status in the program.

Thesis Projects

A thesis project is required of all students to graduate with a B.F.A. degree. Each student will have the option to choose one of the following three for the thesis project; the student must declare his or her project by the end of the Fall II semester (the third semester in the 4 semester cycle.)

- a film or video production that is no longer than 10 minutes
- a fiction screenplay no longer than 30 pages
- a 25-50 page research paper in an area of critical studies

These options allow the student to create a thesis project that reflects his or her personal interest and strengths whether it is in production, as a screenwriter, or in the area of critical studies. The B.F.A. program reserves the right to determine the final number of thesis projects in each category.

Equipment & Facilities

Undergraduate students in the B.F.A. Film and Video program use 16mm film, as well as standard and Hi-Definition video cameras. Location and studio lighting equipment are available as well as sound recording and audio equipment. Editing facilities consists of non-linear digital editing labs with Final Cut Pro editing software and Macintosh computer systems. In addition, the department has film and video projection theatres, two production studios, a "black box" theatre space, and a resource center.

Requirements for All Majors

The following requirements apply to all students entering the College in the Fall 2009 semester or thereafter. Currently enrolled students are subject to the requirements in effect when they declared their major. Students reentering the college or transferring from other institutions with credits in the major should consult the appropriate Program Director for applicability of those courses to the current requirements.

A 2.5 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.5 and above to graduate with a degree from the Department of Media & Communication Arts.

Requirements for the B.F.A. Degree

Program Director: Prof. Herman Lew

BFA Film & Video students are required to maintain a major GPA of 3.0 or higher.

Required Courses

Note: MCA 10100, MCA 10500 and MCA 12100 (total 9 cr.) are prerequisites to all B.F.A. courses.

MCA 20000	Introduction to Film Production	3
MCA 20500	Editing	3
MCA 21500	Sound Production & Design	3
MCA 22100	History and Theory of Film I	3
MCA 22200	History and Theory of Film II	3
MCA 23200	Documentary Workshop I	4
MCA 30100	Critical Approaches to Independent Documentary	3
MCA 32100	Motion Picture Production Workshop I	3
MCA 32300	Screenwriting Workshop	3
MCA 32500	Directing for Film and Video	3
MCA 42400	Senior Writing Workshop	3
MCA 42600	Digital Post Production	3

One of the following two: (4 credits)

MCA 42200	Motion Picture Production Workshop II	4
MCA 43200	Documentary Workshop II	3

One of the following four: (3 credits)

MCA 40200	Critical Approaches to Film Directors	3
MCA 40300	The Documentary in Film & Television	3
MCA 40400	Studies in Film History and Aesthetics	3
MCA 29900	Internship in Communications I	1-6
MCA 39900	Internship in Communications II	1-6

Subtotal: 45

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Journalism Minor

Journalism

Students learn the essentials of reporting and writing in the areas of print, radio and web-based production. The concentration is geared toward students interested in an interdisciplinary approach. Using the research and reporting techniques of journalism, students are encouraged to use New York City as a laboratory, exploring the City's people, communities, government, art and culture. In addition to its full-time teaching staff, the program attracts leading journalists as lecturers and teachers.

The minor provides instruction in the principles and practices of journalism, emphasizing the development of strong writing skills, with emphasis on the intellectual and ethical issues they will face in the profession. Through the six courses (four of which are required and two of which are electives) students learn how to write and produce features, hard news stories, and profiles that can be part of their portfolios in each medium. As part of the curriculum, students also work at WHCR ("The Voice of Harlem"), the College's community radio station, where they learn both production and radio journalism.

Students are encouraged to do one or two journalism internships before they graduate, taking advantage of the numerous opportunities that exist living and studying in the media capital of the world. Upon graduating, students are prepared to pursue entry-level jobs in journalism in all forms of media or graduate level studies in either journalism or other disciplines.

Requirements for the Minor in Journalism

Required Courses

MCA 10100	Introduction to Media Studies	3
MCA 23300	Introduction to Journalism	3
MCA 33300	Reporting and Writing	3

One of the following two:

MCA 34100	Radio Journalism OR	3
MCA 34300	Television Journalism	3

Two electives from departmental list (6 credits)

Subtotal: 18

Cinema Studies Minor

Requirements for the Minor in Cinema Studies

Required Courses

MCA 12100	Introduction to Film Studies	3
MCA 22100	History and Theory of Film I	3

Three courses from the following list: (9 credits)

ANTH 27200	Television & Film: Anthropological Perspectives on the Mass Media	3
ANTH 24900	Visual Anthropology	3
ASIA 31116	Japanese Film	3
ASIA 31825	Chinese Film	3
ASIA 31826	Chinese Gender & Nation In Film & Lit	3
ASIA 31100	Chinese Philosophy	3
ENGL 35303	Shakespeare in Film	3
ENGL 41414	Feminist Lit & Film	3
FREN 33300	French Cinema And Literature	3
ITAL 28700	Italian Cinema and Literature	3
SPAN 33000	Representations of Contemporary Spain in its Cinema	3
SPAN 33100	Representations of Latin America Through its Cinema	3
HIST 46900	Indian Cinema and Popular Culture	3
JWST 31113	The Hollywood Jew	3
JWST 31116	Jew In European Film	3
JWST 31402	Israel-Palest Film	3
MCA 22200	History and Theory of Film II	3
MCA 30100	Critical Approaches to Independent Documentary	3
MCA 40200	Critical Approaches to Film Directors	3
MCA 40400	Studies in Film History and Aesthetics	3
PHIL 31404	Philosophy & Film	4

Subtotal: 15

Electives for Non-Majors

B.A. courses in the Department are open to non-majors with the approval of the program directors, provided prerequisites have been met. Students should see the appropriate program director for information.

Electives

MCA 10100	Introduction to Media Studies	3
MCA 10500	Introduction to Media Production	3
MCA 12100	Introduction to Film Studies	3
MCA 23300	Introduction to Journalism	3

Internships

Students who are declared Media and Communication Arts majors or journalism minors may apply for internship credit if they meet the following qualifications: a total G.P.A. of 2.5 or above; completion of a minimum of 15 credits toward the major with a G.P.A. in the major of 2.5; completion of a minimum of 70 academic credits. Life experience or previous internship credit is not acceptable.

Students can earn one, two, or three credits per internship and may take two internships (three, with permission of the Internship Director) during their undergraduate training. The number of credits per internship is determined by the Internship Director, based on hours worked.

Internships usually require students to work on-site 8-20 hours per week for 15 weeks.

All internships must be approved by the Internship Director in advance.

Internships are available through the MCA Department and the College's Career Services Center located in the North Academic Center. Students must apply through the Department and be approved before starting an internship. The number of credits earned is decided by the Director. Applications are available in SH 472A, the office of the Internship Director.

Advisement

Upon enrolling as a major, each student is assigned a faculty advisor. For new majors and those who do not have an assigned advisor, see the appropriate Program Director.

Advertising and Public Relations

Professor Ed Keller, B.A. Program Director
SH 280; 212-650-5039

Film and Video Production

Professor Herman Lew, B.F.A. Program Director
SH 473; 212-650-6558

Journalism

SH 472; 212-650-7167

Facilities and Equipment

Located in historic Shepard Hall, the Department of Media and Communication Arts provides a wide variety of equipment and facilities for film and video production, advertising and public relations, and journalism. Students enrolled in the appropriate courses have access to equipment and facilities that will support their education in the department as well as prepare them for industry standards when they graduate.

WHCR-FM (90.3)

The College's low-power FM radio station, reaching all of upper Manhattan, serves the Harlem community especially and functions as a laboratory for Communications majors.

The Richard S. Cohen Resource Center

The Richard S. Cohen Resource Center is a comfortable setting for individual viewing of film and video, and reading and studying magazines, journals and newspapers.

The holdings include a few hundred VHS and DVD format films, a selection of film, advertising, PR and new media journals, political commentary magazines and the major metropolitan newspapers.

Computer Labs

Three labs with networked computers for word processing, data research, telecommunications, and simple desk-top publishing and advanced graphics design programs.

The Picker Center

The Picker Center brings to the Department of Media and Communication Arts distinguished scholars, artists, and media professionals. The Center sponsors events that promote a knowledge of the roles that the media arts play in contemporary society. No less

important, the events serve to put students in contact with practitioners from the media professions. These encounters range from visits to small classes to gatherings open to the entire community. In the past, for example, Academy Award winning director Jonathan Demme offered a master class to directing students while producer Maggie Renzi and director John Sayles previewed a feature film for the college community. The Picker family now includes several generations of distinguished film professionals. For many years, their philanthropy supported the department's B.F.A. program which trained such filmmakers as Julie Dash (*Daughters of the Dust*) and Joseph Vasquez (*Hangin' with the Homeboys*).

Awards and Scholarships

Communications Alumni Award

For excellence in Media and Communication Arts.

L.L. Richard Guylay Class of 1934 Prize

For a member of the editorial staff who has demonstrated outstanding commitment to The Campus paper throughout the year.

Irving Rosenthal Award

For an outstanding journalism student.

Joseph Vasquez Memorial Award

For excellence in graduate film or media arts.

Phyllis Berlowe Scholarship Award

For outstanding junior or senior majoring in Public Relations/Advertising specialties.

Art Stevens CCNY/PRSA-NY Scholarship Award

For an outstanding junior or senior majoring in Ad/PR specialties.

Helen Ostrowski Scholarship Award

For an outstanding international junior or senior majoring in Ad/PR.

Faculty

Lynn Appelbaum, Professor

B.M., Ithaca College; M.A., Indiana Univ.

Gerardo Blumenkrantz, Assistant Professor

BFA, School of Visual Arts; MFA, School of Visual Art

Jerry Carlson, Professor and Chair

B.A., Williams College; A.M., Univ. of Chicago, Ph.D.

Campbell Daghish, Associate Professor

B.A., Univ. of Colorado; B.F.A., Yale School of Drama

David Davidson, Professor

B.A., Univ. of Illinois; M.F.A., New York Univ.

David Harris, Lecturer

B.S., Boston Univ.; M.B.A., Univ. of North Carolina

Lynne Scott Jackson, Distinguished Lecturer

B.A., Howard Univ.

Edward Keller, Associate Professor

B.A., Columbia Univ., M.B.A.

Andrzej Krakowski, Professor

M.F.A. (Equiv.), Polish State Film School, American Film Institute.

Babak Rassi, Associate Professor

B.A., George Mason Univ., M.F.A., Florida State Univ.

Nancy Tag, Professor

B.A., Univ. of Pennsylvania; M.F.A., New School Univ.

Antonio Tibaldi, Assistant Professor

B.A., Univ. of Florence; M.F.A., Florida State Univ.

Linda Villarosa, Lecturer

B.A., Univ. of Colorado

Andrea Weiss, Professor

B.A., State Univ. of New York at Binghamton; Ph.D. (American History), Rutgers Univ.

Department of Music

(Division of Humanities and the Arts)

Professor Shaugn O'Donnell, Chair • Department Office: SH 72 • Tel: 212-650-5411

General Information

The City College offers the following undergraduate degrees in Music:

B.A. (p. 209)

B.F.A. (p. 209)

Departmental Mission

The mission of the Music Department is to offer comprehensive undergraduate major programs combining musicology (history, theory, and analysis) with electives in composition, performance, and popular music studies, leading to the Bachelor of Arts degree (B.A.); and professional training in classical or jazz performance, or music & audio production technology, leading to the Bachelor of Fine Arts degree (B.F.A.). These programs may be customized according to the post-collegiate objectives of individual students. To that end free electives are recommended not only as a supplement to specialization, but also as an opportunity to pursue other interests and to broaden intellectual and cultural perspectives.

Music, Bachelor of Arts (B.A.)

Requirements for the B.A. Degree

Before pursuing a B.A. in Music, students must take the Music Theory Placement Exam, given a week before each semester begins. Students demonstrating basic proficiency will be permitted to enroll in the required theory and history courses. Those needing additional study before declaring the major will be directed to the non-major courses MUS 10100, MUS 13100, MUS 15400 and MUS 16100, to prepare for the next placement exam. Advanced placement exams are also available on testing day for students with prior formal training; these exams include keyboard and sight-singing components.

A 2.5 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students are required to maintain a cumulative GPA of 2.0 or higher in order to graduate with a BA in Music.

Required Music Courses:

Theory I – IV	12
Aural Skills I – IV	12
Music History I – IV	12
Keyboard Skills I – II 4	4
Ensemble 2	2

Subtotal: 42

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Music, Bachelor of Fine Arts (B.F.A.)

Requirements for the B.F.A. Degree

B.F.A. students must audition (classical or jazz performance) or submit an audio portfolio (Sonic Arts) before being admitted to any of the programs listed below. Students must also demonstrate proficiency on the Music Placement Exam before beginning the theory and history sequences.

B.F.A. students are required to maintain a major GPA of 2.5 or higher. The GPA in the major is calculated from courses in the major based in

the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.0 and above to graduate with a B.F.A. in Music.

For Classical Instrumentalists

Required Music Courses:

Ensembles (6 semesters)	6
Private Instruction (6 semesters)	12
Class Instruction in Piano I – II (required only of non-pianists)	2
Theory I – IV	12
Aural Skills I – IV	12
Music History I – IV	12
Instrumentation and Arranging for Classical Music	3
Music electives	9

Subtotal: 64

For Classical Vocalists

Students in this program must take or be exempt from Voice Class I and II before taking Private Instruction.

Required Music Courses:

Chorus (4 semesters)	4
Vocal Ensemble (4 semesters)	4
Private Instruction (6 semesters)	12
Class Instruction in Voice I – II	2
Class Instruction in Piano I – II	2
Theory I – IV	12
Aural Skills I – IV	12
Music History I – IV	12
Music electives	8

Subtotal: 64

For Jazz Instrumentalists

Students in this program must take a placement exam before taking Jazz Harmony & Improvisation or MUS 49001.

Required Music Courses:

Private Instruction (6 semesters)	12
Large Jazz Ensemble (4 semesters)	4
Small Jazz Ensemble (4 semesters)	4
Jazz Harmony and Improvisation I – IV	16
Jazz Piano I – II	2
Jazz Repertory and Performance Practice I – IV	12
Jazz History I – II	6
Music electives	8

Subtotal: 64

For Jazz Vocalists

Students in this program must take a placement exam before taking Jazz Harmony & Improvisation.

Required Music Courses:

MUS 26015	Jazz Vocal Ensemble	1
MUS 27500	Jazz Piano I	2
MUS 27600	Jazz Piano II	2
MUS 32311	Jazz Vocal Repertory and Performance Practices I	2
MUS 32411	Jazz Vocal Repertory and Performance Practices II	1
MUS 42311	Jazz Vocal Repertory and Performance Practices III	2
MUS 42411	Jazz Vocal Repertory and	2

	Performance Practices IV	
MUS 35701	Jazz Harmony I	2
MUS 35801	Jazz Harmony II	2
MUS 45701	Jazz Harmony III	2
MUS 36001	Jazz Vocal Workshop	2
MUS 35703	Musicianship and Improvisation for Jazz Vocalists I	2
MUS 35803	Musicianship and Improvisation for Jazz Vocalists II	2
MUS 45703	Musicianship & Improvisation for Jazz Vocalists III	2
MUS 45803	Musicianship & Improvisation for Jazz Vocalists IV	2
MUS 34400	Jazz History I: From its Origins to 1950	3
MUS 34500	Jazz History II: From 1950 to the Present	3
MUS 35000	Studio Ensemble Singing	3
MUS 49002	Jazz Vocal Instruction	3
	Electives	14

MUS 26015, MUS 36001: 2 semesters

MUS 49002: 6 semesters; 12 credits

Subtotal: 64

For Music and Audio Technology Students (Sonic Arts)

Required Music Courses:

Introduction to MIDI & Audio Technologies I – II	6
Synthesis & Sound Design I – II	6
Digital Audio I – II	6
Microphone Applications I – II	6
Multi-Track Production Techniques I – II	6
Audio for Moving Images	3
Theory I – IV	12
Aural Skills I – IV	12
Instrumentation and Arranging for Commercial Music	3
Class Instruction in Piano I – II	2
Music History or Jazz History (one of which must be chosen from the Music History Sequence)	6

Theory I – IV; Theory Practicum I – IV: Students may substitute the equivalent number of credits of Ensembles, Large Performing Groups, or approved electives for which they qualify, instead of taking Theory IV and/or Musicianship IV, with permission of the Department.

Advanced Recording, Mixing & Mastering (3 cr.), though not required, is highly recommended for all fourth-year students in the program.

Subtotal: 64

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Exemption Credit

Students who feel they are eligible to be exempt from required or elective courses may elect to take placement exams, which are given during registration each semester. All students (majors and non-majors) with strong backgrounds in any area are urged to take the exemption exams in order to be placed in more advanced courses that will be appropriately challenging. Interested students should call the Music Office to obtain the dates of the next placement exam.

Electives for Non-Majors

All courses except Private Instruction are open to students who meet the prerequisites. Students with an interest in a particular aspect of music may elect courses from among the following:

Basic Music

MUS 10100	Introduction to Music	3
MUS 10200	Introduction to World Music	3
MUS 14500	Introduction to Jazz	3
MUS 13100	Elementary Musicianship	2
MUS 16100	Aural Fundamentals	2
MUS 15400	Beginning Piano	2
MUS 16500	Class Instruction in Voice I	1

Ensembles

The following ensembles are open to non-majors by audition only:

MUS 16002	Chorus	1
MUS 16004	Large Jazz Ensemble	1
MUS 26005	Latin Band	2
MUS 16001	Orchestra	1

Advisement

Information is available in the Music Office (SH 72) detailing the B.A. and B.F.A. curricula. All students should meet with a department advisor at registration each semester. Majors in the Department of Music are expected to maintain a minimum GPA of 2.5. Those who fall below that number will be called in for a conference with a departmental advisor to discuss ways of improving academic performance. The advisor may recommend taking a particular course for better preparation, meeting with a tutor in the Writing Center, taking a course load lower than 15 credits, or other strategies for achieving academic success. All students should try to maintain the highest possible GPA in order to enhance their prospects for acceptance to graduate programs and career opportunities.

Students who have questions regarding special areas of study should contact the appropriate program Director:

B.A. Program Director

Prof. Jonathan Pieslak
SH 78A; 212-650-7665

B.F.A. Jazz Director

Prof. Steve Wilson
SH 72B; 212-650-7660

Sonic Arts Director

Prof. Paul Kozel
SH 82D; 212-650-8217

B.F.A. Classical Instrumental Supervisor

Prof. Alison Deane
SH 78D; 212-650-7657

B.F.A. Classical Vocal Supervisor

Prof. Ira Spaulding
SH 80B; 212-650-7566

B.F.A. Jazz Vocal Supervisor

Prof. Suzanne Pittson
SH 76A; 212-650-7656

Music Education Advisor

Prof. Stephen Jablonsky
Shepard 80D; 212-650-7656

Facilities

In 1993 the Music Department relocated to totally renovated quarters in historic Shepard Hall. In addition to new offices, studios, rehearsal rooms and an electronic piano lab, the state-of-the-art facilities include the following specialized locations:

Recital Hall

A beautifully appointed, natural acoustic concert hall (SH 95) is the site of performances by soloists and small ensembles. Seating one hundred and fourteen, it features audio recording and playback capabilities, and film and video projection systems. Its warm ambiance makes it the ideal location for important lectures and symposia.

Practice Rooms

Individual and group practice rooms are available to students registered in music major courses. Apply at the beginning of each semester in the Music Office (SH 72).

The Music Library

The Music Library (SH 160) has a collection of over 18,000 recordings, 18,400 scores, and 13,300 books about music, as well as 60 current periodicals subscriptions. All areas of music, including European and American art music, non-Western music, folk, jazz, and popular music, are represented. In addition to Internet work stations and playback facilities for recordings and videos, students have access to 10 Mac stations for computer-aided instruction.

The Sonic Arts Center

A cutting-edge facility consisting of four Production Studios, a Sound Lab, a Control Room/Classroom, and an Isolation Room. The Sonic Arts Center is the site for courses and student projects in sound design and synthesis, digital audio, audio for film and video, music production, and acoustic recording techniques.

Aaron Davis Hall

Located on the South Campus is the well-known Aaron Davis Hall of the Davis Center for the Performing Arts. Its stunning architecture houses an innovative three-theatre performing arts complex that presents public performances and exhibitions by students as well as professional artists, and serves as the cultural hub of upper Manhattan.

Department Activities

Performing Groups

Chorus, jazz and Latin ensembles, and various chamber and vocal ensembles are open to all qualified students. Consult the instructor of each group for information about application and audition procedures.

Concert Series

Faculty members, students and visiting performers present concerts in Aaron Davis Hall, the Great Hall, or in the Recital Hall (SH 95). A schedule of events is published every semester and is available from the Music Office.

CUNY Jazz Festival

The CUNY Jazz Festival is held every May at Aaron Davis Hall. Presented in cooperation with Jazz at Lincoln Center, it is a showcase for the best student bands from CUNY and selected area high schools. Each year a world-class artist is invited to perform with the student ensembles as well as their own group. Recent guest artists have included Wycliffe Gordon, Victor Goines, Luciana Souza, and Adam Rogers, Dave Leibman, and the Village Vanguard Orchestra.

Visiting Artist Series

- **Fred Hersch Master Class:** Each semester a traditional master class is conducted by the gifted teacher and renowned pianist Fred Hersch, a unique artist who Downbeat magazine referred to as "one of the small handful of brilliant musicians of his generation."
- **Master Class Series:** Each semester two master classes are given by a variety of invited jazz artists such as Dave Liebman, Maria Schneider, Jim McNeely, The Stockholm Jazz Orchestra, Dick Oatts, Norma Winstone, Dave Gilmore, Tim Ries, Jon Gordon, Charles Pillow, Pete McGuinness, Scott Wendholt, and John Stowell.
- **Village Vanguard Orchestra:** The music department is the rehearsal home of the world-famous Village Vanguard Orchestra. At these open rehearsals students have the opportunity to ask questions, watch "the books," and listen to music that is at the core of big band repertoire, including charts by Thad Jones, Jim McNeely, Bob Brookmeyer and Slide Hampton. Students also get to

observe their teachers at work since seven of the band members are CCNY private instructors. Formerly known as The Thad Jones/Mel Lewis Orchestra, The Village Vanguard Orchestra has been performing every Monday night at the Village Vanguard since 1965.

- **Friends of Music:** Friends of Music is an organization, open to all students, whose purpose is to promote and stimulate the performance of live music, and coordinate student tutoring.
- **Student Representatives:** Once a year, the Music majors elect representatives to participate, with full voting rights, on the Executive Committee.

Awards

The ASCAP-Chappell/City College Gershwin Award

For composing, arranging, or presenting music for the theater.

The Jerome Ash Scholarship

To a deserving Sonic Arts student.

The Lisl Barnett Award

To a talented pianist.

The Mark Brunswick Award

To undergraduate and graduate students, for excellence in music composition.

The Israel Edward Drabkin Award

To a promising sophomore or junior music major.

The Ervin Drake Awards

To the outstanding songwriters in Theory II.

The Friar Foundation Award

For an entering student on the basis of the audition for the B.F.A. program.

The Ivan Gillis Memorial Scholarship

To a promising music major, for private instruction in his or her primary performing medium.

The Max E. Greenberg Scholarship

For the private study of an instrument or voice.

The Ben Jablonsky Scholarship

To a sophomore or junior who demonstrates promise in the composition or arranging of popular music or jazz.

The Fritz Jahoda Award

To a talented pianist

The Rosalind Joel Scholarship

To a talented entering student.

The Seymour Peck Scholarships and Creative Awards

To help a student complete a creative project.

The Presser Foundation Scholarship

To an outstanding music major about to enter the senior year.

The Pro Musica Awards

To senior music majors, for distinguished service to the cause of music at the College.

The Edward Rensin Memorial Award

To a senior music major, for outstanding service in music.

The Russano/Hanning Scholarship

To an outstanding student of music history.

The Stanley Sachs Scholarship

To an outstanding entering freshman.

The Sidney Zolot Award For Excellence in Music

To a senior music major who has demonstrated excellence as a performer, composer or scholar.

Faculty

Daniel Carillo, Assistant Professor
B.A., The City College, M.A.

Alison Deane, Associate Professor
B.M., Manhattan School of Music, M.M.
Ray Gallon, Lecturer
B.F.A., The City College, M.A.

Michael Holober, Associate Professor
B.A., SUNY (Oneonta); M.M., SUNY (Binghamton)

Stephen Jablonsky, Associate Professor
B.A., The City College; M.A., New York Univ., Ph.D.

Chadwick Jenkins, Associate Professor
B.A., Towson State University; M.M., Univ. of Maryland; M.Phil., Columbia Univ., Ph.D.

Paul Kozel, Professor
B.Mus., Cleveland State Univ.; M.A., The City College

Orly Krasner, Lecturer
B.A. Univ. of Connecticut; M.A., Queens College; Ph.D., CUNY Graduate Center

Shaun O'Donnell, Associate Professor and Chair
B.A., Queens College, M.A.; Ph.D., CUNY Graduate Center

Jonathan Perl, Associate Professor
B.F.A., CUNY; B.A., SUNY Purchase

Jonathan Pieslak, Associate Professor
B.A., Davidson College; M.A., Univ. of Michigan, Ph.D.

Suzanne Pittson, Assistant Professor
B.A., San Francisco State Univ., M.A.

Scott Reeves, Associate Professor
B.M., Indiana Univ., M.M.

Ira Spaulding, Lecturer
B.Mus., Westminster Choir College, M.Mus., Eastern Kentucky Univ.

Steven Wilson, Associate Professor

Professors Emeriti

David Bushler

Ronald L. Carter

David Del Tredici

John Graziano

Barbara Russano Hanning

Department of Philosophy

(Division of Humanities and the Arts)

Professor Ben Vilhauer, Chair • Department Office: NA 5/144C • Tel: 212-650-7291

General Information

The City College offers the following undergraduate degree in Philosophy:

B.A. (p. 212)

Programs and Objectives

The discipline of philosophy is concerned with understanding reality and human action via systematic analysis and argument. It surveys important and influential ideas of the past and present, examines their presuppositions, and provides the student with the instruments of a reflective and responsible life.

Philosophy, Bachelor of Arts (B.A.)

Requirements for Majors

After completing their core requirements, students ought to have ample credits left over to distribute between a concentration program and free electives. Students should consult the Department Chair or a

Department Advisor to identify a concentration program best suited to their academic interests (e.g. in the philosophy of natural and/or social science, logic and mathematics, ethical theory, law, etc.). Students should choose free electives not only as a supplement to their concentration program, but as an opportunity to pursue their intellectual interests and broaden their perspectives. Students may also jointly major in Philosophy and another discipline, such as English, History, Physics or Psychology.

BA Philosophy students are required to maintain a major GPA of 2.0 or higher. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.0 and above to graduate with a BA in Philosophy.

Required Courses

One course in logic, either: (3 credits)

PHIL 20200	Introduction to Logic OR	3
PHIL 20100	Logical Reasoning	3

One course in history, either: (3 credits)

PHIL 30500	History of Philosophy I: Ancient	3
PHIL 30600	History of Philosophy II: Modern	3

Eight other Philosophy courses at 30000 or above: (24 credits)

Philosophy courses at 30000 or above are the following:

PHIL 30100-30400	Honors I-IV	variable, but usually 3 cr./sem.
PHIL 30500	History of Philosophy I: Ancient	3
PHIL 30600	History of Philosophy II: Modern	3
PHIL 30700	Metaphysics and Epistemology	3
PHIL 30800	Ethics	3
PHIL 30900	Social and Political Philosophy	3
PHIL 31000	Independent Study and Research	Variable, but usually 3 cr./sem.
PHIL 31100-32000	Special Topics in Philosophy	variable, but usually 3 cr./sem.
PHIL 32100	Symbolic Logic	3
PHIL 32200	Philosophy of Science	3
PHIL 32300	Philosophy of Mind	3
PHIL 32400	Philosophy of Language	3
PHIL 32500	Aesthetics: The Philosophy of Art	3
PHIL 32600	Philosophy of Law	3
PHIL 32700	Philosophy of Religion	3
PHIL 32800	Philosophy of Social Science	3
PHIL 32900	Philosophy of History	3
PHIL 33400	Philosophy of Artificial Intelligence	3
PHIL 33500	Philosophy of Film	3
PHIL 33600	Philosophy of Space and Time	3
PHIL 33700	Decision Theory	3
PHIL 33800	Philosophy of Wittgenstein	3
PHIL 33900	Kierkegaard, Nietzsche, Freud	3
PHIL 34000	Self and Identity	3
PHIL 34100	Philosophy of Psychoanalysis	3
PHIL 34400	World Philosophies	3
PHIL 34500	American Philosophy	3
PHIL 34600	Feminist Philosophy	3
PHIL 34700	Contemporary Philosophy	3
PHIL 34800	Continental European Philosophy	3
PHIL 34900	Applied Ethics	3

PHIL 35000	Major Philosopher(s)	3
PHIL 35400	Seminar in Advanced Topics in Philosophy	3

Subtotal: 30

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Dual Major

The Philosophy Department offers a range of courses on a regular basis specially suited to students wishing to major in both philosophy and law, psychology, English, history, education, and other disciplines. Please read the introductory section on dual majors and contact the Department for specific information on specific programs.

Philosophy Minor

Requirements for Minor

The minor in philosophy is recommended for students who wish to improve those critical analytic skills developed by philosophy—and greatly valued by business and the professions—but who have insufficient credit hours available to major in philosophy.

Required Courses

One of the following four: (3 credits)

PHIL 10200	Introduction to Philosophy	3
PHIL 20100	Logical Reasoning	3
PHIL 20200	Introduction to Logic	3
	Any 30000-level Philosophy course	

Plus five additional PHIL courses above 30000 (15 credits)

Subtotal: 18

Advisement

The department Chair and all full-time members of the Department serve as department advisors. Their office hours are posted at the beginning of every semester.

Majors in the Department of Philosophy are expected to maintain a minimum GPA of 2.5. Those who fall below that number will be called in for a conference with a departmental advisor to discuss ways of improving academic performance. The advisor may recommend taking a particular course for better preparation, meeting with a tutor in the Writing Center, taking a course load lower than 15 credits, or other strategies for achieving academic success. All students should try to maintain the highest possible GPA in order to enhance their prospects for acceptance to graduate programs and career opportunities.

Department Activities

The Philosophy Department has a student-operated Philosophy Club, which meets regularly during club hours (Thursday 12:00–2:00 p.m.) during the academic year. Information about Philosophy Club activities is listed on the Department Notice Board opposite NA 5/144. The Philosophy Department also runs its own colloquium series, with talks presented by members of the philosophy department and by visiting speakers.

Tutoring

The Philosophy Department tries to maintain a student-operated tutorial service. Students who feel that they need tutorial help should contact the Department Secretary for further information.

Awards

The department awards prizes (usually to graduating seniors) for excellence in various areas:

Brittain Prize: Moral Philosophy

Felix S. Cohen Prize: Philosophy of Law

Ketchum Prize: History of Philosophy

Sperling Award: Best Student

Ward Medal: General Excellence in Philosophy

For detailed information see, the Guide to the City College Prizes, Awards, and Medals in the office of the department Chair.

Faculty

Jeffrey Blustein, Zitrin Professor of Bioethics
A.B., University of Minnesota; Ph.D., Harvard University

Elise Crull, Assistant Professor
B.Sc., Calvin College; Ph.D., University of Notre Dame

Chad Kidd, Assistant Professor
B.A., University of Texas, Austin; Ph.D., University of California, Irvine

Lou Marinoff, Professor

B.Sc., Concordia Univ.; Ph.D., Univ. College, London

Jennifer Morton, Assistant Professor
A.B., Princeton University; Ph.D., Stanford University

Nickolas Pappas, Professor
B.A., Kenyon College; Ph.D., Harvard University

Massimo Pigliucci, K.D. Irani Professor of Philosophy of Science
B.S., M.S., Univ. of Rome La Sapienza; Ph.D., Univ. of Connecticut; Ph.D., Univ. of Tennessee

Katherine Ritchie, Assistant Professor
B.A., Lewis and Clark College; Ph.D., University of Texas at Austin

Benjamin Vilhauer, Associate Professor
A.B., Harvard University; Ph.D., University of Chicago

David Weissman, Professor
B.A., Northwestern Univ.; M.A., Univ. of Chicago; Ph.D., Univ. of London

Professors Emeriti

Abraham Edel

K.D. Irani

Harry Tarter

H. S. Thayer

Phillip P. Wiener

Department of Physics

(Division of Science)

Professor Alexios Polychronakos, Chair • Department Office: MR 419
• Tel: 212-650-6832

General Information

The City College offers the following undergraduate degree in Physics:
B.S. (p. 215)

Programs and Objectives

The Department of Physics provides a comprehensive program designed to enable students to acquire a basic understanding of the laws of nature and their application, and to prepare them for a career either in physics or in one of the many science and technology oriented professions for which physics is a basic component. The various introductory courses are therefore designed to meet a variety of student needs, including general knowledge, preparation for professional work (engineering, materials science, photonics, premedical, biomedical physics, architecture, teaching, etc.) and preparation for advanced work in physics. A sequence of advanced courses is provided primarily for Physics majors but is also open to other interested students. The aim of

these courses is to train students for technical employment in industry or government and for graduate work.

In addition to the Standard Physics Concentration the Department offers an Applied Physics Concentration, a Secondary Education Concentration and a Biomedical Physics Concentration. The Applied Physics Concentration has two tracks: Materials Science or Optics/Photonics.

The Department cooperates in the Program in Premedical Studies (PPS), a program of the Division of the College of Liberal Arts and Science. This allows the student to major in Physics while participating in PPS. The program features a curriculum that integrates a variety of learning experiences specifically preparing participants to meet medical, dental and veterinary school admission requirements as well as those for physician's assistant and physical therapy advanced degree programs.

Honors

The Research Honors Program is one of several ways for undergraduate students to participate in faculty research projects. Such projects, if judged to be of sufficient quality and quantity, may lead to a degree with honors.

Research

The large active research faculty provides undergraduate research opportunities in many fields of experimental and theoretical physics. Modern laboratories provide excellent training facilities in the areas of laser physics, low temperature physics, biophysics, semiconductor physics, and nanoscience. Students can also participate in theoretical physics research, primarily in the areas of condensed matter physics and high energy. Academic credit can be earned for participation in such research projects.

Graduate Courses

Physics majors in their senior year are able to enroll in beginning graduate courses.

Exemption Credit

Qualified students may take exemption examinations for all courses offered by the Department upon application to the Department. Exemption examinations are given at several specified times during the year. For some courses, it will be necessary to complete the laboratory component before full credit is given.

Tutoring

Each faculty member designates two office hours per week when she or he will be available to tutor students.

Department Activities

Colloquia and Seminars

The Physics Department holds a weekly colloquium in a field of general or current interest in physics, usually given by a distinguished outside speaker. All Physics graduate students and Physics majors are invited to attend. In addition there are weekly seminars of a more specialized nature in such areas as high-energy physics, condensed matter physics and biophysics and frequent seminars in such areas as astrophysics and photonics.

Planetarium

The Physics Department maintains a fully equipped planetarium. Programs and shows on an appropriate level are given for elementary schools, junior and senior high schools and the college community as well as other groups upon request. Programs and shows are available both in English and in Spanish.

Awards

The Physics Department annually awards one or more Ward medals and the Sidney Millman Scholarship Award for academic excellence, and a Sonkin medal for the best achievement in experimental physics. Physics students may also compete, along with other students for the Hamermesh Scholarship, the Soodak Scholarship, and the Zemansky Introductory Physics Prizes.

Advisement**Undergraduate Majors**

Professor Jiu Feng Tu
MR 330A, 212-650-5558

Graduate Students

Professor Timothy Boyer
MR 331; 212-650-5585

All other students

Contact the Physics Office (MR-419; 212-650-6832), to be put in touch with an appropriate advisor.

Physics, Bachelor of Science (B.S.)**Requirements for Majors**

A GPA of 2.0 or higher in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

All Physics majors must complete "Basic Courses for Physics Majors" and either the "Standard Physics Concentration" or one of the "Alternative Concentrations."

Foundational courses for the Physics program must be completed before embarking upon related courses in the major. Students with appropriate background as demonstrated by the College's Placement Exam may be exempted from some or all Foundational Courses. The foundational course for Calculus I (Math 20100) is Pre-Calculus (Math 19500), and this course must be passed with a grade of C or higher in order to proceed to the next level.

Basic Courses for Physics Majors

PHYS 20700	University Physics I	4
PHYS 20900	General Physics: Waves, Optics and Modern Physics	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
BIO 10100	Biological Foundations I	4
EAS 10600	Earth Systems Science	4
PHYS 35300	Electricity and Magnetism I	3
PHYS 37100	Advanced Physics Laboratory I	2
PHYS 45100	Thermodynamics and Statistical Physics	3
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 39100	Methods of Differential Equations OR	3
MATH 39104	Methods of Differential Equati	4
MATH 39200	Linear Algebra and Vector Analysis for Engineers OR	3
MATH 39104	Methods of Differential Equati	4
		Subtotal: 52

Standard Physics Concentration**Required Courses**

PHYS 35100	Mechanics	4
PHYS 35400	Electricity and Magnetism II	3
PHYS 47100	Advanced Physics Laboratory II	2
PHYS 55100	Quantum Physics I	4
PHYS 55200	Quantum Physics II	3
PHYS 55600	Current Topics in Physics	1

Physics Elective: (3 credits)

Selected from		
PHYS 31000	Independent Study	1-4
PHYS 31500	Medical Physics	3
PHYS 42200	Biophysics	3
PHYS 42300	Biophysics in Applications	3
PHYS 45200	Optics	3
PHYS 45300	Physical Photonics I/Laser Optics	3
PHYS 45400	Descriptive Astronomy	3
PHYS 52200	Biomedical Physics	3
PHYS 55400	Solid State Physics	3
PHYS 55500	The Physics and Chemistry of Materials	3
PHYS V0100	Mathematical Methods in Physics	4
PHYS V1100	Analytical Dynamics	4
PHYS V1500-1600	Electromagnetic Theory	4 cr./sem.
PHYS V2500-2600	Quantum Mechanics	4 cr./sem.

One of the following:

CSC 10200	Introduction for Computing	3
CSC 10400	Discrete Mathematical Structures	4
MATH 32800	Methods of Numerical Analysis	3
MATH 36600	Introduction to Applied Mathematical Computation	3

Subtotal: 74-76**Materials Science Concentration****Required Courses**

PHYS 35100	Mechanics	4
PHYS 35400	Electricity and Magnetism II	3
PHYS 45200	Optics	3
PHYS 47100	Advanced Physics Laboratory II	2
PHYS 55100	Quantum Physics I	4
PHYS 55400	Solid State Physics	3

Physics Elective: (3 credits)

Selected from		
PHYS 31000	Independent Study	1-4
PHYS 31500	Medical Physics	3
PHYS 42200	Biophysics	3
PHYS 42300	Biophysics in Applications	3
PHYS 55200	Quantum Physics II	3
PHYS 55500	The Physics and Chemistry of Materials	3
PHYS V0100	Mathematical Methods in Physics	4
PHYS V1100	Analytical Dynamics	4
PHYS V1500-1600	Electromagnetic Theory	4 cr./sem.
PHYS V2500-2600	Quantum Mechanics	4 cr./sem.
PHYS	and also selected 30000, 40000 courses	3

Subtotal: 74**Optics/Photonics Concentration****Required Courses**

PHYS 35100	Mechanics	4
PHYS 35400	Electricity and Magnetism II	3
PHYS 45200	Optics	3
PHYS 45300	Physical Photonics I/Laser Optics	3
PHYS 47100	Advanced Physics Laboratory II	2
PHYS 55100	Quantum Physics I	4

Physics Elective: (3 credits)

Selected from

PHYS 31000	Independent Study	1-4
PHYS 31500	Medical Physics	3
PHYS 42200	Biophysics	3
PHYS 42300	Biophysics in Applications	3
PHYS 45400	Descriptive Astronomy	3
PHYS 52200	Biomedical Physics	3
PHYS 55400	Solid State Physics	3
PHYS 55500	The Physics and Chemistry of Materials	3
PHYS V0100	Mathematical Methods in Physics	4
PHYS V1100	Analytical Dynamics	4
PHYS V1500-1600	Electromagnetic Theory	4 cr./sem.
PHYS V2500-2600	Quantum Mechanics	4 cr./sem.
PHYS	and also selected 30000, 40000 courses	3

Subtotal: 74**Biomedical Physics Concentration****Required Courses**

PHYS 42200	Biophysics	3
PHYS 52200	Biomedical Physics	3
	or with permission of major advisor, PHYS 42300, BIO 22900, BIO35400, CHEM 42500, CHEM 43400 or CHEM 48005.	3
CHEM 26300	Organic Chemistry II	3
CHEM 32002	Biochemistry I	3
PHYS 55100	Quantum Physics I	4
PHYS 55600	Current Topics in Physics	1

CHEM 22100

plus one physics elective may be substituted for CHEM 26300 and CHEM 32002 with permission of major advisor

Physics Elective: (3 credits)

Selected from

PHYS 31000	Independent Study	1-4
PHYS 31100-32000	Selected Topics in Physics	3
PHYS 31500	Medical Physics	3
PHYS 35100	Mechanics	4
PHYS 35400	Electricity and Magnetism II	3
PHYS 45200	Optics	3
PHYS 45300	Physical Photonics I/Laser Optics	3
PHYS 45400	Descriptive Astronomy	3
PHYS 67100		
PHYS 52200	Biomedical Physics	3
PHYS 55400	Solid State Physics	3
PHYS 55500	The Physics and Chemistry of Materials	3
PHYS V0100	Mathematical Methods in Physics	4
PHYS V1100	Analytical Dynamics	4
PHYS V1500-1600	Electromagnetic Theory	4 cr./sem.
PHYS V2500-	Quantum Mechanics	4 cr./sem.

2600

One of the following:

CSC 10200	Introduction for Computing	3
CSC 10400	Discrete Mathematical Structures	4
MATH 32800	Methods of Numerical Analysis	3
MATH 36600	Introduction to Applied Mathematical Computation	3

Subtotal: 74-76**Secondary Education Concentration**

Major requirements are listed below. Pedagogical requirements are listed in the Department of Education section (p. 245) of this Bulletin.

Required Courses

PHYS 35100	Mechanics	4
PHYS 35400	Electricity and Magnetism II	3
	Electives to be chosen in consultation with the advisor	6

Subtotal: 65**Elective Courses**

Students who intend to go on to graduate work in Physics should choose, in consultation with the departmental advisor, free electives from among the following:

PHYS 31500	Medical Physics	3
PHYS 42200	Biophysics	3
PHYS 45300	Physical Photonics I/Laser Optics	3
PHYS 45400	Descriptive Astronomy	3
PHYS 52200	Biomedical Physics	3
PHYS 55400	Solid State Physics	3
PHYS 55500	The Physics and Chemistry of Materials	3
	Any graduate course with designation V0100-V2600	
	Selected 30000, or 40000 level courses	

Additional Requirements

Students who intend to go on to complete some graduate work during the undergraduate years should see the concentration advisor concerning possible substitutions for some of the above courses.

Note: most of the non-introductory courses in physics required for Physics majors are given only once a year.

Students who enter this sequence during their sophomore year may thus be free to take physics (or math) electives or graduate courses in their senior year. The latter is especially recommended by the Department. Students who cannot readily fit into this sequence should consult the concentration advisor. All students intending to major in Physics should see the concentration advisor before entering their junior year. Students who do not intend to do graduate work should see the concentration advisor for an individualized program.

General Education Requirements ("PATHWAYS")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements (Pathways) (p. 286) section of the Bulletin for more information. Physics students will satisfy their "Pathways" requirements most efficiently by following these recommendations:

Fixed Core**English Composition I:**

FIQWS	Freshman Inquiry Writing Seminar	6
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English Composition II:

ENGL 21003 Writing for the Sciences 3

Mathematical and Quantitative Reasoning:

MATH 20100 Calculus I 3

Life and Physical Sciences:

PHYS 20700

Flexible Core**World Cultures and Global Issues:**

any CLAS offerings in this category

Individual and Society:

any CLAS offerings in this category

U.S. Experience in its Diversity:

any CLAS offerings in this category

Creative Expression:

any CLAS offerings in this category

Scientific World:

PHYS 20800

Additional course in Scientific World:

CHEM 10401 General Chemistry II 4

OR

EAS 10600 Earth Systems Science 4

College Option**Speech**SPCH 11100 Foundations of Speech
Communication 3

OR

SPCH 00380

*or Proficiency Examination***Foreign language**

two semesters of college-level study, or exemption on the basis of two years of high-school level study, or demonstrated proficiency

Philosophy

any CLAS offerings in this category

Physics Minor**Requirements for a Minor in Physics**

Students in other departments may minor in physics by taking a minimum of 9 credits in Physics beyond the introductory courses (PHYS 20700, PHYS 20800 or PHYS 20300, PHYS 20400). See an advisor in the Physics Department for guidance.

Graduate Courses Open to Undergraduates

Qualified students may take, with Departmental approval, any course available in the Master's Program in Physics or the first year of the Doctoral Programs in Physics. These courses are described in their appropriate catalogs.

FacultyRobert R. Alfano, Distinguished Professor
*B.S., Fairleigh Dickinson Univ., M.S.; Ph.D., New York Univ.*Joseph L. Birman, Distinguished Professor
*B.S., The City College; M.S., Columbia Univ., Ph.D.; Doc-es-Sciences*Timothy Boyer, Professor
B.A., Yale Univ.; M.A., Harvard Univ., Ph.D.

Ngee-Pong Chang, Professor

*B.S., Ohio Wesleyan Univ.; Ph.D., Columbia Univ.*Harold Falk, Professor
*B.S., Iowa State Univ.; Ph.D., Univ. of Washington*Swapan K. Gayen, Professor
*B.Sc. (Honors), Univ. of Dacca, M.Sc.; M.S., Univ. of Connecticut, Ph.D.*Sebastian Franco, Associate Professor
*B.S., Universidad de Buenos Aires; M.S., Instituto Balseiro, Univ. National de Cuyo, Argentina; Ph.D., Massachusetts Institute of Technology*Joel Gersten, Professor
*B.S., The City College; M.A., Columbia Univ., Ph.D.*Pouyan Ghaemi, Assistant Professor
*B.Sc., Sharif Univ. of Technology, Tehran, Iran; Ph.D., Massachusetts Institute of Technology*Daniel M. Greenberger, Distinguished Professor
*B.S., M.I.T.; M.S., Univ. of Illinois, Ph.D.*Marilyn Gunner, Professor
*B.A., SUNY (Binghamton); Ph.D., Univ. of Pennsylvania*James Hedberg, Lecturer
*B.A., St. John's College, Santa Fe, NM; M.S., Portland State University, Portland, OR; Ph.D., McGill University, Montreal, QC, Canada*Michio Kaku, Semat Professor
*B.A., Harvard Univ.; Ph.D., Univ. of California (Berkeley)*Ronald Koder, Associate Professor
*B.S., Univ. of Missouri-Columbia, Ph.D., John Hopkins*Joel Koplik, Professor
*B.S., Cooper Union; Ph.D., Univ. of California (Berkeley)*Lia Krusin-Elbaum, Professor
*Ph.D., New York Univ.*Tony Liss, Martin & Michele Cohen Dean of Science, Professor
*University of California at Berkeley, PhD*Michael S. Lubell, Mark W. Zemansky Professor
*A.B., Columbia Univ.; M.S., Yale Univ., Ph.D.*Hernan Makse, Professor
*Licenciatura (Physics), Univ. of Buenos Aires; Ph.D., Boston Univ.*Vinod Menon, Professor
*M.S., Universit of Hyderabad, India; Ph.D., Princeton University*Carlos Andres Meriles, Professor
*B.Sc., FaMAF, Universidad Nacional de Cordoba, Argentina, Ph.D.*V. Parameswaran Nair, Distinguished Professor
*B.S., Univ. of Kerala; M.Sc., Syracuse Univ., Ph.D.*Vladimir Petricevic, Professor
*Dipl. EE., Univ. of Belgrade; M.S. Miami Univ.; Ph.D., CUNY*Alexios P. Polychronakos, Professor and Chair
*Dip. E.E., National Technological Univ. of Athens; M.Sc., California Institute of Technology, Ph.D.*Alexander Punnoose, Associate Professor
*B.S., Indian Institute of Technology, Kharagpur, India; M.Sc., Indian Institute of Science, Bangalore, India; Ph.D., Indian Institute of Science, Bangalore, India*Myriam P. Sarachik, Distinguished Professor
*A.B., Barnard College; M.S., Columbia Univ., Ph.D.*David Schmeltzer, Professor
*B.Sc., Hebrew Univ.; M.Sc., Technion, D.Sc.*Mark Shattuck, Professor
B.A., Wake Forest Univ., M.S.; Ph.D., Duke Univ.

Javad Shabani, Assistant Professor

B.Sc., Sharif University of Technology, Tehran, Iran; M.Sc., Univ. of California, Santa Cruz; M.A., Ph.D., Princeton University

Brian Tiburzi, Assistant Professor
B.A., Amherst College; M.S., Univ. of Washington, Ph.D.

Jiufeng J. Tu, Associate Professor
A.B., Harvard Univ., A.M.; M.S., Cornell Univ., Ph.D.

Sergey A. Vitkalov, Professor
M.S., Moscow Institute of Physics and Technology; Ph.D., Institute of Solid State Physics, Russian Academy of Sciences

Elisa Riedo, Professor
B.S., University of Milano, Italy; Ph.D., University of Milano, Italy - ESRF Grenoble, France

Participating Faculty

Morton M. Denn, Albert Einstein Professor
B.S.E. (Ch.E.), Princeton Univ.; Ph.D., Univ. of Minnesota

Richard N. Steinberg, Professor
B.S., SUNY Binghamton; M.S., Yale Univ., Ph.D.

Professors Emeriti

Adolf Abrahamson

Michael Arons

Alvin Bachman

Robert Callender

Victor Chung

Hiram Hart

Robert M. Lea

Marvin Mittleman

David Shelupsky

Frederick W. Smith

Martin Tiersten

Department of Political Science

(The Colin Powell School for Civic and Global Leadership, formerly the Division of Social Science)

Professor Bruce Cronin, Chair • Department Office: NA 4/136 • Tel: 212-650-5440.

General Information

The City College offers the following undergraduate degree in Political Science:

B.A. (p. 218)

Program and Objectives and Careers

The Political Science Department offers a wide variety of courses on politics, law and government. Courses explore political institutions of every kind: executive and legislative bodies; courts and legal systems; bureaucracies, political parties, interest groups and coalitions; international organizations; cooperation and conflict; ethnic, religious and ideological movements. We try to understand where political power lies and, how it operates, whose interests it serves (who gets what, when, where, how). At the same time we not only examine how political institutions work, but how they should work, what human values they serve, or violate; and what is the ultimate meaning and purpose of political life.

The department prepares people for careers in politics within city, state and national government; non-profit agencies and advocacy associations; international and non governmental organizations; law; mass communications; social services; and various aspects of private and public planning institutions. However our central vocation is to give

students the knowledge and skills, they will need to become active and productive citizens that can provide civic and global leadership.

Political Science, Bachelor of Arts (B.A.)

Requirements for Majors

Required Courses

PSC 10400: Those who entered City College before fall 2013 are not required to take PSC 10400, but must instead complete one additional elective from any subfield.

Elective Courses

In addition at least 9 courses, including the following distribution across the four subfields of political science: (27 credits)

Two (2) United States Politics

One (1) Comparative Politics and Government

One (1) International Relations

One (1) Political Theory and Philosophy

Four (4) additional Political Science courses from any subfield

Subtotal: 36

Grade Point Average Requirements

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Advisement

Honors Program

Political Science majors may pursue an honors degree in the major by applying during the spring semester of their junior year. Admission to the program requires (1) a 3.2 average in courses taken in the Social Sciences and (2) approval by the Department Honors Supervisor. Those accepted into the program must write a senior thesis and enroll in the following courses during their senior year.

30600: Senior Honors Thesis I

First part of the year-long honors thesis course. Students learn to design and conduct their own research in political science in the first half of a two-semester thesis seminar sequence. Honors Thesis I covers key elements of research design such as literature reviews, developing research questions, choosing appropriate methods and data, and writing a proposal. 3 hr./wk.; 3 cr

30700: Senior Honors Thesis II

Upon successful completion of PSC 31548, students continue their original research and present and criticize each other's work in a workshop format. Continual deadlines keep students on track writing a thesis of at least 45 pages. Pre-req: 3.2 or above GPA and successful completion of Honors Thesis I. 3 hr./wk.; 3 cr

For further information, consult the supervisor of the Honors Program.

Internships

The Political Science Department offers an Internship in Public and International Affairs, as well as information regarding internships in the New York State Assembly and State Senate, unions, environmental groups, and other governmental and non-governmental institutions. For information on available internships consult a Department advisor.

The Department also cooperates with the Rosenberg-Humphrey Program in sponsoring summer internships in Washington, D.C. and the Colin Powell Center Fellows Program.

Departmental Activities

The Political Science Department sponsors a number of student organizations, such as the Government and Law Society and the International Relations Club.

Awards

The following awards are given by the Political Science department. The recipients are chosen by a committee of faculty.

The D'Agostino/Greenberg Scholarship in Law and Public Policy
 The Bennett Essay Prize
 The Henry Epstein Rule of Law Prize
 The Hillman Bishop Award
 The Ivo Duchacek Prize
 The Kupferman Prize
 The Murray A. Murray Gordon Scholarship Award & Ward Medal for best graduating senior in Political Science
 The Samuel Hendel Award
 The Stanley Feingold Prize Scholarship for best essay in American Politics
 The Theodore Leskes Memorial Award
 The Ward Medal
 The Carl Dunat Prize Award for excellence in the study of Political Science
 APO Scholarship for a student with economic need and outstanding achievements
 Hendel Award for Excellence in Constitutional Law for excellence in Constitutional Law and Civil Liberties
 Goldberg Award to Student going to law school to aid LSAT preparation
 Theodore R. Kupferman Prize in Urban Legal Studies for a future law student focused on Urban Law
 Stephanie E. Kupferman Juvenile Justice Award for an outstanding law student working in juvenile rights
 Epstein Award for the best student in Introduction to American Politics
 Heywood Burns Memorial Scholarship for a sophomore or junior with a minimum GPA of 3.0
 Popper Scholarship for outstanding work in Political Science
 Bennett Prize for the outstanding essay in Political Science
 Marshall Berman Award for outstanding work in Political Theory

Faculty

Carlos I. Accetti, Assistant Professor
B.A., Oxford Univ. (Lincoln College); M.A., Institut d'Etudes Politiques de Paris; Ph.D., Columbia Univ.

Sherrie L. Baver, Professor
B.A., Barnard College; M.Phil., Columbia Univ., Ph.D., Columbia Univ.

Richard B. Bernstein, Lecturer
B.A., Amherst College; J.D., Harvard Univ.

Jacqueline A. Braveboy-Wagner, Professor
B.A., Univ. of the West Indies, M.Sc.; Ph.D., Univ. of Arizona

Vincent G. Boudreau, Professor and Dean, Colin Powell School for Civic and Global Leadership
B.A., LeMoyne College; M.A., Cornell Univ., Ph.D. Cornell Univ.

Bruce Cronin, Professor and Chair
B.A., SUNY (Albany); M.A., New York Univ.; Ph.D. Columbia Univ.

Daniel R. DiSalvo, Associate Professor
B.A., Skidmore College; M.A., Fordham Univ.; Ph.D., Univ. of Virginia

Lynda Dodd, Associate Professor and Flom Professor
B.A., Baylor Univ.; J.D., Yale Univ.; M.A., Princeton Univ., Ph.D.

Diana Greenwald, Assistant Professor
B.A., Georgetown University; Ph.D., University of Michigan

Jean Krasno, Lecturer

B.F.A., Univ. of Illinois; M.A., Stanford Univ.; Ph.D., CUNY Graduate Center

John Krinsky, Professor
B.A., Swathmore; M.A., Columbia Univ., Ph.D., Columbia Univ.-

Rajan Menon, Spitzer Professor
B.A. St. Stephen's College, Delhi Univ. (India); M.A., Lehigh Univ.; Ph.D., Univ. of Illinois

George Mitchell, Assistant Professor
B.A., West Virginia Univ.; M.A., Syracuse Univ., Ph.D., Syracuse Univ.

Mira Morgenstern, Professor
B.A., City College; M.A., Yeshiva Univ.; Ph.D., Princeton Univ.

Nicholas Rush Smith, Assistant Professor
B.A., College of William & Mary; M.A., George Washington Univ.; M.A. Univ. of Chicago, Ph.D.

Professors Emeriti

Moyibi J. Amoda

Allen B. Ballard

Randolph L. Braham

John A. Davis

Alan Fiellin

Joyce Gelb

Diana Gordon

John H. Herz

George N. McKenna

Thomas G. Karis

Arnold Rogow

Edward V. Schneier

Pre-Law Program

(The Colin Powell School for Civic and Global Leadership, formerly The Division of Social Science)

Professor Richard Bernstein, Acting Director • Program Office: NA 4/138A • Tel: 212-650-7385

PLEASE NOTE: THIS PROGRAM IS NO LONGER ACCEPTING NEW STUDENTS.

General Information

The City College offers the following undergraduate degree in Pre-Law:
B.A. (p. 220)

Programs and Objectives

Admission to law school is not based upon any specific pre-legal course of study. Superior students from all disciplines are accepted by law schools, and no student should feel it necessary to major in pre-law to be a competitive applicant to schools of law. Indeed, most legal educators strongly encourage undergraduate pre-law students to avoid

an excessively narrow course of study and to enroll in challenging courses which will strengthen their writing and analytical abilities.

The American Bar Association recommends that pre-law students follow a course of studies which will give them precision and polish in both written and spoken English, sharpen their skills of reasoning, logic, decision-making, and analytical thinking, and equip them with a broad understanding of history, politics, economics, philosophy and the relationship of law to social institutions. Similarly, a 1982 Task Force Report to the Conference of Chief Justices called for "an undergraduate course of study that fosters a broad understanding of U.S. political institutions and values, an appreciation of the history of Western culture and ideas, insight into human behavior, and experience in the analysis and critical examination of ideas."

The interdisciplinary Pre-Law Major is designed to offer City College undergraduates just such a broad and demanding curriculum.

Pre-Law, Bachelor of Arts (B.A.)

Requirements for Majors

Required Courses

Economics:

One of the following two: (3 credits)

ECO 10000		
ECO 10300	Prin Macroeconomics	3

English:

ENGL 21002	Writing for the Social Sciences	3
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One of the following two: (3 credits)

ENGL 23000	Writing Workshop in Prose	3
ENGL 33000	Crit Rdng & Writ 1	3

Philosophy:

PHIL 20100	Logical Reasoning	3
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Two of the following three: (6 credits)

PHIL 11100	Critical Thinking	3
PHIL 30800	Ethics	3
PHIL 30900	Social and Political Philosophy	3

Political Science:

PSC 12600	Introduction to the Legal Process	3
PSC 20800	American Political Thought	3
PSC 20900	Amer Pol Thought 2	3
PSC 21200	Constitutional Law	3
PSC 21300	Civil Liberties	3

Elective Courses (12 credits)

Four courses from the following list, or as approved by the pre-law advisor: [No more than two from any single department]

ANTH 20100	Cross-Cultural Perspectives	3
ANTH 22500	Class, Ethnicity and Gender	3
ANTH 23100	Anthropology of Law	3
ECO 22000	Microeconomics 1	3
ECO 22100	Microeconomics 2	3
ECO 22500		
ECO 22600	Macroeconomics II	3
ENGL 41900	Mythic Patterns	3
HIST 37000	American Legal History	3
HIST 33200		
HIST 33300		
HIST 33400		
HIST 33500		
HIST 33600		
PHIL 30500	History of Philosophy I: Ancient	3
PHIL 30600	History of Philosophy II: Modern	3

PHIL 30900	Social and Political Philosophy	3
PSC 20700	The Politics of Criminal and Civil Justice	3
PSC 22000	The Judiciary	3
PSC 22100	The Congress	3
PSC 22200	The Presidency	3
PSC 27500	Contemporary Political Thought: 1848 to the Present	3
PSY 24700	Social Psychology	3
PSY 36900	Behavior in Organizations	3
SOC 23700	Foundations of Sociological Theory	4
SOC 24100	Criminology and Corrections	3
SOC 25100	Urban Sociology	3
Subtotal: 45		

Grade Point Average Requirements

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Premedical Studies Program

(Division of Science)

Belinda G. Smith, Director • Department Office: MR 529 • Tel: 212-650-6622

General Information

Programs and Objectives

Mission Statement

The mission of the Program in Premedical Studies (PPS) of the Division of Science of the City College of New York is to identify and prepare undergraduate and post-baccalaureate students for entry into the professional programs in the health sciences (medicine, dentistry, osteopathy, optometry, podiatry, and veterinary sciences). The program advances students' knowledge of careers in health sciences through academic advisement, workshops, and symposia.

We interact with hospitals and other clinical centers to provide volunteer and research opportunities for students to facilitate your gaining acceptance to the professional program of your choice. We help guide students through the application process with information on timeliness, and assistance with personal statements, and preparation for interviews.

Eligibility Requirements for Undergraduate Students interested in PPS:

- a completed application;
- a cumulative 3.0 GPA and a 3.0 GPA in science courses;
- one year of general biology;
- one semester of general chemistry;
- one semester of calculus.

Please note: New Transfer students and New Freshman can still apply to the Program in Premedical Studies as a pre-premed student if they have not met the above requirements.

Eligibility Requirements for Post-Baccalaureate Students interested in PPS:

Two-step application process: students must submit the CUNY Transfer Admission application, and the Program in Premedical Studies Post-baccalaureate application. Two letters of recommendation are required.

A personal statement is also required. Official transcripts must be forwarded from the undergraduate institution to the Director. Students must have a minimum 2.8 GPA to be considered for the post-baccalaureate program at the City College of New York. The application deadlines are May 1 for summer, August 1 for fall and December 1 for spring.

Undergraduate Research

Qualified juniors and seniors may elect to do research in biochemistry, biology, chemistry, physics or psychology. Projects are supervised and guided by members of the City College faculty. Some of these students are eligible for scholarships and salaries through the Biomedical Research Programs.

Premedical Studies Program

Program Requirements

PPS students who are undergraduate degree candidates must select a major department and complete all departmental and divisional requirements. Most courses listed are also applicable to the departmental major in science.

Pre-Med/Pre-Dental/Pre-Vet Required Courses

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 26100	Organic Chemistry I	3
CHEM 26300	Organic Chemistry II	3
CHEM 26200	Organic Chemistry Laboratory I	2
CHEM 45900		
PHYS 20400	General Physics II	4
PHYS 20700	University Physics I	4
MATH 20100	Calculus I	3
MATH 20900	Elements of Calculus and Statistics	4
PSY 10200	Applications of Psychology in the Modern World	3
SOC 10500	Individual, Group and Society: An Introduction to Sociology	3

PHYS 20300-20400: for Biology, Humanities or Social Science majors

PHYS 20700-20800: for Chemistry or Physics majors

Subtotal: 49

Advisement

The program in Premedical Studies provides academic guidance and career counseling, among other services. Students who need advice on course planning, information regarding seminars and symposia, etc., have the opportunity to meet with Peer Advisors in the office, MR-529; 212-650-6622 or email premedical@sci.cuny.cuny.edu.

Clubs

The Caduceus Society

The City College Premedical (Caduceus) Society, founded at the College in 1935, presents weekly lectures and workshops on medical school admissions policies, financial aid, interviewing techniques and other matters related to admission to schools of health professions.

Alpha Epsilon Delta

Alpha Epsilon Delta, the national Premedical Honor Society, has a chapter at the City College of New York. The mission of the Society is to encourage and recognize excellence in premedical scholarships; to stimulate an appreciation of the importance of premedical education; to promote communication between medical and premedical students and educators; to provide a forum for students with common interests; and to use its resources to benefit health organizations, charities and the community.

Pre-Dental Honor Society

The Pre-Dental Honor Society at CCNY was re-instated in January 2013. PDHS hosts lecturers, such as dental school admissions, current dentists, and current dental students; holds general pre-dental preparation sessions; and organizes tours to dental schools.

Project Sunshine

Project Sunshine Chapter at the City College of New York is an undergraduate club and an extension of the Project Sunshine national non-profit organization. Project Sunshine provides free educational, recreational, and social programs to children and families living with medical challenges.

Awards

The Bolognino Scholarship

To students admitted to medical, optometry, veterinary or podiatric school.

The Sigmund and Rebecca L. Mage Scholarship

To assist students in the process of applying to professional schools of medicine, dentistry, optometry, veterinary medicine and podiatry.

The Dr. Jonas E. Salk Scholarship Award

To undergraduate students admitted to medical school. A university-wide award.

The Irving (Isaac) Shendell Memorial Scholarship

To undergraduate and post-baccalaureate students admitted to dental school.

Department of Psychology

(The Colin Powell School for Civic and Global Leadership, formerly the Division of Social Science)

Professor Robert Melara, Chair • Department Office: NA 7/120 • Tel: 212-650-5442

General Information

The City College offers the following undergraduate and combined degrees in Psychology:

- B.A. (p. 222)
- B.S. (p. 222)
- B.A./M.A. (Combined Degree) (p. 223)

Programs and Objectives

The major provides students with a broad overview of theoretical and research perspectives in psychology and applications of these perspectives to social and community issues. Undergraduate training is offered through gateway courses and advanced courses and can include honors study and laboratory and fieldwork. These offerings provide opportunities for students to work closely with faculty and professionals in the field on research and service projects. Both the B.A. and the B.S. are degree options for psychology majors. Highly qualified and motivated students can earn their B.A. and M.A. degrees simultaneously. The department also offers the coursework needed to obtain New York State certification as an Alcohol and Substance Abuse Counselor. Graduates of the Department of Psychology should be:

Knowledgeable

Understand basic and more advanced psychological theories, principles, and concepts in a variety of areas such as human development, social interaction, psychopathology, cognitive processes, and the biological bases of behavior.

Analytical

Acquire and apply critical thinking to the content of a discipline and to practical problems they confront in other settings, including: evaluating fact-based evidence, engaging in both inductive and deductive logical reasoning, identifying and considering multiple points of view, and applying the above processes to problem-solving.

Conduct research and evaluate research by others, including: evaluating hypotheses, research designs, research findings, and theories and formulating questions and hypotheses, designing research protocols, and analyzing research findings, using appropriate statistical procedures and statistical software packages.

Practical

Apply psychological concepts, principles and research findings to understanding social, political, and cultural phenomena and to their own lives and experiences.

Effective in Communication

Demonstrate effective communication skills in oral, written, and numerical formats.

Professional in Attitudes and Behavior

Act ethically, both in the conduct of research and in their everyday interactions.

Psychology, Bachelor of Arts (B.A.)

Requirements for Majors

The majority of Psychology majors choose the BA program; however the BS program may offer advantages for those students who intend to go on to graduate/professional school in such fields as neuroscience, medicine, allied health professions, or other sciences. The BS is also a good choice for those students who have already completed the math and science requirements listed below, and those who are generally successful in math and science courses. To determine whether the BA or the BS is the better option for you, we recommend that you meet a Psychology Faculty Advisor.

Required Courses for the B.A. in Psychology

One of the following three:

PSY 10101	Psychology for Freshman Honors Students	3
PSY 10200	Applications of Psychology in the Modern World	3
PSY 10299	Applications of Psychology in the Modern World	3

Take the following courses

PSY 21500	Applied Statistics	4
PSY 32100	Experimental Psychology	4

Three "Gateway" Psychology courses (1 course from 3 of the 4 major areas of Psychology) (9 credits)

Developmental Area

PSY 22600	Introduction to Life-Span Development	3
	OR	
PSY 24600	Introduction to Human Development: Infancy and Childhood	3

Social/Personality Area

PSY 24700	Social Psychology	3
	OR	
PSY 24900	Psychology of Personality	3

Cognitive Area

PSY 25300	Cognitive Psychology: Thinking, Knowing and Remembering	3
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Biological Area

PSY 25400	Brain, Mind and Experience	3
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Four Psychology Courses at the 30000-level or above (12 credits)

Subtotal: 32

Grade Point Average Requirements

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Psychology, Bachelor of Science (B.S.)

Requirements for Majors

The majority of Psychology majors choose the BA program; however the BS program may offer advantages for those students who intend to go on to graduate/professional school in such fields as neuroscience, medicine, allied health professions, or other sciences. The BS is also a good choice for those students who have already completed the math and science requirements listed below, and those who are generally successful in math and science courses. To determine whether the BA or the BS is the better option for you, we recommend that you meet a Psychology Faculty Advisor.

Required Courses for the BS in Psychology

Math and Science Courses:

Any two of the following Calculus courses: (8-10 credits)

MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 20500	Elements of Calculus	4
MATH 20900	Elements of Calculus and Statistics	4

Four courses from the following (16 credits)

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
EAS 10600	Earth Systems Science	4
EAS 22700	Structural Geology	4
PHYS 20400		
PHYS 20700		
PHYS 20800		

Take the following course (3 credits)

ENGL 21003	Writing for the Sciences	3
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One of the following three: (3 credits)

PSY 10200	Applications of Psychology in the Modern World	3
PSY 10101	Psychology for Freshman Honors Students	3
PSY 10299	Applications of Psychology in the Modern World	3

Take the following courses (6 credits)

PSY 21500	Applied Statistics	4
PSY 32100	Experimental Psychology	4

Three "Gateway" Psychology courses (1 course from 3 of the 4 major areas of Psychology) (9 credits)

Developmental Area

PSY 22600	Introduction to Life-Span Development	3
	OR	
PSY 24600	Introduction to Human Development: Infancy and	3

Childhood

Social/Personality Area

PSY 24700	Social Psychology OR	3
PSY 24900	Psychology of Personality	3

Cognitive Area

PSY 25300	Cognitive Psychology: Thinking, Knowing and Remembering	3
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Biological Area

PSY 25400	Brain, Mind and Experience	3
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Four Psychology Courses at the 30000-level or above (12 credits)

Majors must place into calculus (Math 20100 or Math 20500 or higher) or may be required to complete the prerequisite sequence through Math 19500.

Subtotal: 59-61

Grade Point Average Requirements

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Psychology Minor

Requirements for the Minor

Students may minor in Psychology by completing PSY 10200 or PSY 10101 or PSY 10299 and any additional four 3-credit Psychology courses achieving a total of 15 credits.

Psychology, Bachelor of Arts/Master of Arts (B.A./M.A.)

Students with a general GPA of at least 3.2 and a Psychology GPA of at least 3.5 may apply to the B.A./M.A. program after having completed at least PSY 21500: Applied Statistics, two gateway courses, and having an idea of a research direction. The combined degree requires the completion of 54 credits, 32 for the undergraduate degree and 22 for the graduate degree. An application includes three letters of recommendation from members of the faculty and a written personal statement describing the likely area of thesis interest and/or mentor for that research. Students are admitted during both Fall and Spring semesters. Applications from outstanding transfer students are encouraged once a student has enrolled in classes at CCNY, has targeted a research interest, and can acquire a recommendation from at least one CCNY faculty member. Interested students should contact Professor Vivien Tartter, Director, B.A./M.A. Program, NAC 7/209; 212-650-5709.

To earn the B.A./M.A. degree, the requirements for the undergraduate major must be met (32 credits including Statistics, Experimental Psychology, Gateway courses in three areas and advanced courses in two). Students may substitute MA courses for the undergraduate 30000-level course requirement. Students complete one semester of honors research during their senior year and submit at the end of that year a full literature review in their thesis area.

For the MA degree, students must submit a full empirical thesis, including the literature review, and complete 22 credits of MA coursework not also counting toward the BA degree. These classes must include graduate statistics, graduate experimental, a Master's-level course from the cognitive, biological or assessment psychology areas, and a one-semester research seminar.

BA/MA Required Courses

Undergraduate Psychology Courses:

One of the following three

PSY 10200	Applications of Psychology in the Modern World	3
PSY 10101	Psychology for Freshman Honors Students	3
PSY 10299	Applications of Psychology in the Modern World	3

Take the following courses

PSY 21500	Applied Statistics	4
PSY 32100	Experimental Psychology	4

Three gateway (20000-level) courses (9 credits)

Four 30000-level or MA-level courses which may include 1 semester of PSY 30100 Honors Research (12 credits)

Subtotal: 32

Graduate Psychology Courses:

PSY V0100	Advanced Experimental Psychology I	4
PSY V0500	Statistical Methods in Psychology I One MA-level course from among the areas of cognitive, physiological, or assessment psychology	3 3
	Three additional MA-level courses	9
PSY B9900	Psychological Research and Seminar	3

Subtotal: 22

Subtotal: 54

Laboratory and Fieldwork

Majors are strongly encouraged to gain practical training in psychology, either through research experience in laboratories administered by full-time faculty in the Psychology Department or by working at local agencies or organizations involved in psychology-related activities. Research experience is particularly valuable for the opportunity to work closely on a research project with a faculty member. The experience can be used in preparation for honors study or in application for advanced graduate study in psychology. PSY 23300-23600 are each one-credit courses in laboratory and fieldwork, which can be taken in consecutive semesters. Interested students should contact Prof. Sophia Barrett, (sbarrett@ccny.edu), NAC 7/214, 212-650-5900.

Honors Degree in Psychology

The Honors Program in Psychology offers high-achieving and highly motivated students the opportunity to design and fully implement an original research project. Students must enroll in PSY 32100 (Experimental Psychology) during the first semester of honors work. Typically, the project is begun during the junior year under the supervision of a faculty research mentor, and continues for three semesters. Often the student designs the study during the first semester, spends the second semester collecting data, and the third semester conducting data analyses and writing a research report based on the data. Students receive honors research credit across consecutive semesters in PSY 30100, PSY 30200, and PSY 30300, respectively. The final research report must be typewritten, following the style outlined in most current version of the Publication Manual of the American Psychological Association. For more information contact Prof. Brett Silverstein, (bsilverstein@ccny.cuny.edu), NAC 7/120, 212-650-5700.

Credentialed Alcohol and Substance Abuse Counselor (CASAC) Program

Majors are able to complete the undergraduate coursework in psychology required for a CASAC Trainee certificate awarded by the

New York State Office of Alcoholism and Substance Abuse Services (OASAS) – the official state authority that awards credentials for addiction counseling. OASAS has approved ten 3-credit psychology courses as meeting the NY State education requirements for the addiction counselor-trainee credential. A CASAC-Trainee certificate is issued by NY State OASAS once a minimum of 450 clock hours of OASAS-registered education and training courses have been satisfactorily completed at CCNY. For current information and to register in the CASAC program, contact Prof. Lesia Ruglass (lruglass@ccny.cuny.edu), NAC 7/222, 212-650-7821.

Required Courses for CASAC Program:

Take the following courses

PSY 24600	Introduction to Human Development: Infancy and Childhood	3
PSY 25400	Brain, Mind and Experience	3
MED 100	OR	
PSY 34000	Drug and Alcohol Abuse: Causes and Treatment	3
PSY 35000	Treatment of Substance Abuse	3
PSY 36000	Treatment of Substance Abuse II	3
PSY 36300	Psychology of Prevention	3
PSY 36500	Family Psychology	3
PSY 36700	Small Group Processes	3
PSY 37000	Counseling Issues in Addiction	3
PSY 38000	Introduction to Clinical and Counseling Psychology	3

Advisement

For a current schedule of advisement hours, please inquire in the Department Office, NAC 7/120, or phone 212-650-5442

Psychological Center

The department's Psychological Center offers psychological testing and short- and long-term therapy to CCNY students, as well as to individuals from the community and surrounding areas, with mood, anxiety, and interpersonal problems. Married and unmarried couples, single-parent and two-parent families, students of all ages and their parents are welcome. The Psychological Center is part of the doctoral training program in Clinical Psychology. Treatment is provided by advanced doctoral students under the supervision of the clinical faculty, licensed clinical psychologists from other programs, and external licensed clinical supervisors. All services are completely confidential. For further information, and to request an application for services, visit the Psychological Center's front desk, which is located in NAC 8/101, or call 212-650-6602. The Center is open Monday through Friday, 8:30 a.m. - 7:30 p.m. The Center is closed in August, and during College holidays and vacations.

Department Activities

The Psychology Students Association (PSA)

The PSA or "Psychology Club" is a student-run organization that encourages psychology majors as well as non-majors to broaden their horizons in the field of psychology and accentuate their participation within the City College community. The club meets weekly on Thursdays from 12:30 to 1:45 pm. Office hours are posted outside NAC 7/120. During club hours PSA hosts both formal and informal seminars and lectures in which invited speakers share some of their experiences as working psychologists and offer helpful hints about securing a future career in psychology. During informal meetings PSA engages in team-building exercises and various group related activities such as movie nights, bake sales, study-groups and freshman tutoring as well as field-trips to various psychological conventions. PSA provides an excellent opportunity to learn leadership skills that will be helpful in future

careers. The department encourages all psychology students to join the PSA and become active in its leadership. Interested students should contact the club at psychclub11@gmail.com

Psi Chi

Psi Chi is the National Honor Society in Psychology, founded in 1929 for the purposes of encouraging, stimulating, and maintaining excellence in scholarship, and advancing the science of psychology. Psi Chi provides national recognition for academic excellence in psychology, an honor that can be noted on employment applications, vitae, and résumés. Psi Chi also provides over \$250,000 annually in awards and grants to its student members and chapters. The City College of New York chapter of Psi Chi was chartered in 1961, and has supported both undergraduate and graduate students pursuing research interests in such areas as clinical, cognitive, social, and developmental psychology. Membership in Psi Chi is recognized at Departmental honors ceremonies. Psi Chi also publishes a journal of undergraduate research that includes useful information for students in psychology. Membership in Psi Chi is open to qualified candidates of any age, sex, sexual orientation, race, handicap or disability, color, religion, and national and ethnic origin. Membership is for life. The national registration fee of \$55 is the only payment ever made to the national organization, which does not charge dues. Students qualify for membership in Psi Chi if they: (1) are recommended by a faculty member, (2) have taken 9 credits of psychology beyond PSY 10200, (3) have a minimum 3.0 grade point average (GPA) in Psychology AND in cumulative grades, and (4) have completed 3 semesters of college courses. Interested students should contact Prof. Brett Silverstein, (bsilverstein@ccny.cuny.edu), NAC 7/120, 212-650-5700.

Departmental Colloquium Series

Throughout the year the Psychology Department sponsors lectures on various topics in psychology, including cognitive neuroscience, clinical psychology, and health psychology, given by prominent members of the scientific community. The lectures are free and open to the public. Majors are encouraged to attend. For current information, please come to the Department Office NAC 7/120 or phone 212-650-5442.

Awards

The following awards are given annually at the department's awards ceremony, held each May:

Bernard R. Ackerman Foundation Award

Joseph E. Barmack Memorial Award

Francis P. Hardesty Award

Gardner Murphy Award

Ward Medal

Kenneth Clark Award

For more information on awards, contact the Department Chair.

Faculty

Adeyinka Akinsulure-Smith, Associate Professor
B.A., Univ. of Western Ontario; M.A., Columbia Univ., Ed.M., M.Phil., Ph.D.

Deidre M. Anglin, Associate Professor
B.S., Cornell Univ.; M.A., Fordham Univ., Ph.D.

Sophia Barrett, Lecturer
B.A., CCNY, M.A.

William Crain, Professor
A.B., Harvard Univ.; Ph.D., Univ. of Chicago

Diana Diamond, Professor
B.A., Wesleyan Univ.; M.A., Univ. of Massachusetts, M.S., Ph.D.

Timothy Ellmore, Associate Professor
B.A. George Washington Univ.; M.A.; Univ. of Arizona, Ph.D.

Adriana Espinosa, Assistant Professor

B.A. City College; Univ. of California at Berkeley, Ph.D.

Eric Fertuck, Associate Professor
B.S. Michigan State Univ.; Ph.D., Adelphi Univ.

Tiffany Floyd, Assistant Professor
B.A. SUNY (Binghamton); M.A., Temple Univ., Ph.D.

Peter Fraenkel, Associate Professor
B.A., Boston Univ.; Ph.D., Duke Univ.

Benjamin Harris, Clinical Professor,
B.A., Wesleyan Univ.; M.E., Lesley Univ; Ph.D., CUNY

Jon C. Horvitz, Professor
B.A., Haverford College.; Ph.D., Univ. of California (Santa Barbara)

Elliot Jurist, Professor
B.A., Haverford College; Ph.D. (Philosophy) Columbia Univ.; Ph.D., CUNY

William L. King, Professor
B.A., Rutgers Univ.; M.A., Univ. of Colorado, Ph.D.

Teresa Lopez-Castro, Assistant Professor
B.A., Columbia Univ.; Ph.D. CUNY

Karen Langsam, Lecturer
M.A., Ph.D., Stony Brook Univ.

Arthur D. Lynch, Associate Professor
B.A., Univ. of Texas, Ph.D.

Robert D. Melara, Professor and Chair
B.A., Stony Brook Univ.; M.A., New School, Ph.D.

Glen Milstein, Associate Professor
B.A., Brandeis Univ.; Ph.D., Teachers College (Columbia Univ.)

Sarah O'Neill, Assistant Professor
B.S.C., Univ. of Otago (NZ); Ph.D. Univ. of Otago (NZ)

Richard Paino, Lecturer
B.A., Rutgers University; M.A., Fairleigh Dickenson University

Margaret Rosario, Professor
B.A., Princeton Univ.; Ph.D., New York Univ.

Jeffrey J. Rosen, Professor
B.A., George Washington Univ.; M.A., Clark Univ., Ph.D.

Millicent Roth, Professor
B.A., Brooklyn College, M.S.W., D.S.W., New York Univ.

M. Sasha Rudenstine, Assistant Professor
B.A., Haverford College; M.A. CCNY; Ph.D. CUNY

Lesia Ruglass, Assistant Professor
B.A. New York Univ.; M.A., Boston Univ.; Ph.D., New School for Social Research

Irvin S. Schonfeld, Professor
B.S. Brooklyn College; M.A., New School; Ph.D., CUNY

Brett Silverstein, Presidential Professor
B.A., State Univ. of New York (Stony Brook); Ph.D., Columbia Univ.

Ratna Sircar, Professor
B.Sc., Univ. Delhi; M.Sc., All-India Institute of Med. Sci, Ph.D.

Ellen E. Smiley, Associate Professor
B.S., Denison Univ.; A.M., Univ. of Illinois, Ph.D.

Vivien C. Tartter, Professor
B.A., Brown Univ., M.A., Ph.D.

Steven B. Tuber, Professor
B.A., Yale; M.A., Univ. of Michigan, Ph.D.

Deborah Vietze, Professor
B.S., Univ. of Redlands; M.S., Univ. of Southern California; Ph.D., Columbia Univ.

Paul Wachtel, Distinguished Professor
A.B., Columbia Univ.; M.S., Yale Univ., Ph.D.

Lissa Weinstein, Professor
B.A., SUNY (Stony Brook); M.A., The City College; Ph.D., CUNY

Ann Marie Yali, Associate Professor
B.A., Eckerd College; M.A., SUNY (Stony Brook), Ph.D.

Professors Emeriti

John Antrobus

Anderson J. Franklin

Douglas C. Kimmel

Jerry Siegel

Arietta Slade

Public Policy and Public Affairs Program

(The Colin Powell School for Civic and Global Leadership)

Professor John Krinsky, Director • Program Office: NA 4/136A • Tel: 212-650-5236

General Information

This minor specialization offers an interdisciplinary approach to studying policy issues with an emphasis on acquiring the analytical tools required for policy development, policy analysis, and decision-making.

Students should first complete PSC 10100: United States Politics and Government before beginning the minor. The minor then requires a total of 14-16 credits. Students who complete courses listed below for the minor that also satisfy requirements for their majors should complete additional courses from the list below. Transfer credits may be applied to the minor provided they appear as an equivalent course on the transcript. Substitutions may be granted at the discretion of the program director.

Public Policy Minor

Requirements for the Minor

Five courses from the following list:

PSC 12500	Introduction to Public Policy	3
ECO 10250	Principles of Microeconomics	3
ECO 10350	Principles of Macroeconomics	3

At least one of the following:

ECO 20150	Principles of Statistics	4
SOC 23100	Sociological Statistics	3
PSY 21500	Applied Statistics	4
MATH 20900	Elements of Calculus and Statistics	4
MATH 37500	Elements of Probability Theory	4
MATH 37600	Mathematical Statistics	4
MATH 37700	Applied Statistics and Probability	3
CSC 21700	Probability and Statistics for Computer Science	3
CE 26400	Civil Engineering Data Analysis	3

At least one of the following:

PSC 21000	Urban Politics	3
PSC 21600	Political Parties and Interest Groups	3
PSC 21700	Mass Media and Politics	3
PSC 22300	United States Foreign Policy	3
PSC 21002	Politics and Leadership	3
PSC 22100	The Congress	3

PSC 31507	The Politics of Immigration	3
PSC 32701	Seminar Internship in Public and International Affairs	4
PSC 32702	Seminar Internship in Public and International Affairs	4
SOC 23300-23600	Field Work in Social Service or Tutorial Research	3 cr. Maximum: 6 cr. cumulative.
SOC 24100	Criminology and Corrections	3
SOC 24200	Juvenile Delinquency	3
SOC 24300	Sociology of Youth	3
SOC 24400	Principles of Social Work	3
SOC 24500	Sociology of Social Welfare Institutions	3
SOC 24800	Studies in Deviant Behavior	3
SOC 25100	Urban Sociology	3
SOC 25300	Ethnic Minority Groups	3
SOC 25500	Population and Human Ecology	3
SOC 27400	Urban Politics and Policy	3
SOC 29000	Immigration	3
SOC 25400	Social Problems	3
SOC 31211	Pub Pol Intrn 2	3
HIST 32700	The U.S. Since 1945	3
HIST 44100	The History of American Labor	3
INTL 20100	International Studies: A Global Perspective	3

Substitutions for any of the courses in these categories may be made with permission of the Director of the Public Policy Minor.

In addition, students must take an internship or a course involving fieldwork or service learning at a public service agency.

Subtotal: 15

Advisement

Students should seek advisement with the program director. Some courses have prerequisites or require permission from their respective departments.

Department of Sociology

(The Colin Powell School for Civic and Global Leadership, formerly the Division of Social Science)

Associate Professor Maritsa Poros, Chair • Department Office: NA 6/125 • Tel: 212-650-5485

General Information

The City College offers the following undergraduate degree in Sociology:

B.A. (p. 226)

Programs and Objectives

Sociology majors may choose to take a varied selection of courses or they may take advantage of the Department’s concentration.

In the past the Department’s majors have gone on to leadership positions in academic life; city, state, and local government; advertising; consulting; and a number of other related professions.

Concentration in Urban Issues and Public Service

For students anticipating careers in the city or just interested in urban concerns, the Department offers a concentration in urban issues, politics, immigration, and public service, with sub-specialties in urban studies and policy, crime and deviance, and social work.

These concentrations take advantage of our location in the heart of one of the most complex cities in the world. The objective is to bring social

science theory and research to bear upon the pressing issues that confront major cities like New York, such as economic restructuring, immigration, housing, neighborhood transitions, education, urban poverty, politics, and fiscal crisis. These concentrations prepare students for careers in specific areas such as education, urban planning, public policy, and public administration.

The Social Research Laboratory

The Social Research Laboratory is used by the Department of Sociology to place students in projects providing pre-professional experience in social welfare agencies. SRL courses (SOC 23300, SOC 23400, SOC 23500, and SOC 23600) may be taken by any student. The student need not be concentrating in Social Work or majoring in Sociology. Students may take the above courses for either two or three credits. The maximum number of credits allowed in these courses (commonly referred to as "fieldwork courses") is six in any one department of the College.

Master’s Courses for Undergraduate Students

Some graduate courses may be taken by exceptional juniors and seniors with the permission of the instructor. Students are strongly advised to get the permission of the instructor in writing well before registration. The authorization will be required at registration.

Sociology, Bachelor of Arts (B.A.)

Requirements for Majors

Required Courses

SOC 10500	Individual, Group and Society: An Introduction to Sociology	3
SOC 23200	Methods and Techniques of Sociological Research	4
SOC 23700	Foundations of Sociological Theory	4

Elective Courses

Seven additional Sociology courses	21
Subtotal: 32	

Note: 23300-23600: Fieldwork does not count as one of the seven courses, but does count towards graduation

Concentration in Urban Issues, Politics, and Policy

While a great number of courses offered by the Department are relevant to urban concerns, the following electives are especially recommended for a concentration:

SOC 23300-23600	Field Work in Social Service or Tutorial Research	3 cr. Maximum: 6 cr. cumulative.
SOC 24100	Criminology and Corrections	3
SOC 24200	Juvenile Delinquency	3
SOC 24300	Sociology of Youth	3
SOC 24400	Principles of Social Work	3
SOC 24500	Sociology of Social Welfare Institutions	3
SOC 24800	Studies in Deviant Behavior	3
SOC 25100	Urban Sociology	3
SOC 25300	Ethnic Minority Groups	3
SOC 25500	Population and Human Ecology	3
SOC 27400	Urban Politics and Policy	3
SOC 29000	Immigration	3

(Although the department does not offer a degree in Social Work, a concentration in this area has been found most helpful for students who later wish to study for M.S.W. degrees).

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students.

See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Grade Point Average Requirements

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree.

Sociology Minor

Requirements for Minors

Students who wish to minor in Sociology are required to complete the following:

Required Course:

SOC 10500	Individual, Group and Society: An Introduction to Sociology	3
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Elective Courses:

Four approved courses	12
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Subtotal: 15

Advisement

Prof. Gwendolyn Dordick is the Department advisor for major requirements and other academic issues. Contact her by email at gdordicksociologyadvisor@gmail.com

Students wishing advisement on the graduate program in Sociology should see the director of the MA program.

Faculty

James J. Biles, Associate Professor
B.S.S., Ohio State Univ.; M.A., Michigan State Univ., Ph.D.

Mehdi Bozorgmehr, Professor
B.S., California State Univ.; M.A., San Diego State Univ.; M.A., Univ. of California (Los Angeles), Ph.D.

Katherine K. Chen, Associate Professor
B.A., Stanford Univ., M.A.; M.A., Harvard Univ., Ph.D.

Gwendolyn Ann Dordick, Lecturer
B.A., Univ. of California (Los Angeles), M.A.; M.Phil, Columbia Univ., Ph.D.

Norma Fuentes-Mayorga, Assistant Professor
B.A., M.A., M.Phil., Ph.D., Columbia Univ.

William Helmreich, Distinguished Professor
B.A., Yeshiva Univ., M.A.; Ph.D., Washington Univ. (St. Louis)

Ramona Hernandez, Professor
B.A., Lehman; M.A., New York Univ.; Ph.D., CUNY

Yana Kucheva, Assistant Professor
B.A., Brown Univ.; M.A., Ph.D., Univ. of California (Los Angeles)

Jack Levinson, Associate Professor
B.A., Wesleyan Univ.; Ph.D., CUNY

Iris Lopez, Professor
A.A., Borough of Manhattan Community College; B.A., New York Univ.; M.A., Columbia Univ., Ph.D.

R. L'Heureux Lewis-McCoy, Associate Professor
B.A., Morehouse College; M.A., Univ. of Michigan, Ph.D.

Leslie Paik, Associate Professor
B.A., Brown Univ.; M.A., Univ. of California (Los Angeles), Ph.D.

Maritsa V. Poros, Associate Professor and Chair
B.A., Goucher College; M.A., Columbia Univ., M.Phil., Ph.D.

Professors Emeriti

Ibtihaj Arafat

Milton L. Barron

Steven Goldberg

Gerald Handel

Gabriel Haslip-Viera

F. William Howton

Baidya Nath Varma

Charles Winick

Betty Yorburg

Department of Theatre and Speech

(Division of Humanities and the Arts)

Associate Professor Rob Barron, Chair • Department Office: C-G 311 • Tel: 212-650-6666

General Information

The City College offers the following undergraduate degree in Theatre:
B.A. (p. 228)

Theatre

The B.A. degree program in Theatre offers a broad perspective of the academic and professional field, permitting great elective choice, and preparing students for a variety of career options. Following completion of the required sequence of courses, which expose the student to all facets of the theatre field, the student may take upper level elective courses in any one of these facets to gain a mastery of that subject. The student should be advised that further graduate and/or professional study is strongly recommended upon completion of the bachelor's degree before a student may be considered prepared to enter the professional theatre world.

In addition to completing the required curriculum for this degree program, students are encouraged to attend and participate in the numerous faculty and student-directed productions the program offers. These opportunities annually include four main-stage productions, New Play Collaboration projects, and the One-Act Play Festival.

All Theatre majors, and other interested students from the College-at-large, take courses in theatre production at Aaron Davis Hall, which contains two main-stage theatres, and a studio theatre, and at the Compton-Goethals studio theatres. All these spaces boast state-of-the-art scenic, lighting, and sound equipment.

Most courses are open to non-majors without prerequisites, including THTR 12700, THTR 13100, THTR 13200, THTR 13400, THTR 13600, THTR 23800, THTR 23900, THTR 24000, THTR 33000, and THTR 33100; non-majors may register for any other course in the program provided they follow the prerequisite sequence. All students are welcome to participate in the many open-call auditions for productions held each year.

Speech

A non-degree service program that provides the general student population with basic courses for developing skills in oral communication.

Brandon Judell, Speech Proficiency Exam Coordinator
C-G 311; 212-650-6666

Clubs

The Drama Club

The Drama Club, which requires a faculty advisor, is student run and open to all students throughout the college. Its main goal is to foster community building and theatrical exploration. It also has the potential to sponsor performances by students and outside artists, discussions by professionals, and workshops.

Events and Productions

Members of the Department of Theatre and Speech present shows and arrange events throughout the year, including:

- Faculty-directed productions: fully mounted main stage events, including one musical annually.
- The New Play Collaborations: student directors stage original work by student playwrights.
- The One-Act Play Festival
- Advanced Directing Projects
- Professional performances and workshops
- Play-Going Initiative: The department underwrites selected professional theatre-going on a class-by-class basis.

Awards

Seymour Peck Scholarship and Creative Awards in the Arts

To outstanding undergraduate or graduate majors in the arts.

The Sandham Prize for Theatrical Performance

The Scanlon Prize in Theatre

The Bessie Spector Prize

Jacob A. Weiser Playwriting Fund Award

To assist young playwrights in pursuing their artistic goals.

The Bernie West Theatre Award

Facilities

Aaron Davis Hall

Aaron Davis Hall is a modern, three-theatre complex housing state-of-the-art equipment and staffed by professional technical personnel capable of mounting the most complex productions. The facility contains three spaces: The Marian Anderson Theatre, a proscenium theatre that seats an audience of 750; Theatre B, a black box experimental theatre that seats 150-250; and Theatre C, a rehearsal-workshop theatre for 50. The structure was specifically conceived and built to serve as a laboratory for students training in the arts and as a showcase for professional events.

Compton-Goethals Hall

The very finest facilities are available for the use of theatre students in historic Compton-Goethals Hall. These include two studio theatres and various studio-classroom spaces, rehearsal areas and prop rooms.

Charles Gattnig Memorial Theatre Library

Houses an extensive collection of plays, books of history and criticism, and periodicals, all available for perusal and check-out by students.

Theatre, Bachelor of Arts (B.A.)

Requirements for Theatre Majors

A 2.0 GPA in the major is required for graduation. The GPA in the major is calculated from courses in the major based in the major department only, and that have been taken at City College or through ePermit, including all courses in excess of the minimum required for the degree. In addition, students must maintain an overall GPA of 2.0 and above to graduate with a BA in Theatre.

Required Courses

THTR 12700	Speech for the Stage	3
THTR 13100	Introduction to Theatre Arts	3
THTR 13200	Body Movement	3
THTR 13400	Basic Production and Design	3
THTR 13600	Beginning Acting	3
THTR 21100	Theatre History I	3
THTR 21200	Theatre History II	3
THTR 21300	Theatre History III	3
THTR 23300	Directing I	3
THTR 23700	Tech Theater Practic	3
THTR 33100	Playwriting	3

THTR 33300	Directing II	3
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Theatre Majors with pronounced foreign accents or speech impediments are also required to take: (0-4 credits)

SPCH 01100		
SPCH 23300	Voice and Diction	3

Elective Courses (6 credits)

THTR 11300	Stage Makeup	1
THTR 12700	Speech for the Stage	3
THTR 13200	Body Movement	3
THTR 13300	Stagecraft	4
THTR 21400	Dramaturgy	3
THTR 21500	Musical Theatre History	3
THTR 21600	Non-Western Drama	3
THTR 21700	Queer Theatre	3
THTR 21800	American Jewish Theatre	3
THTR 21900	Theatre of the Sixties	3
THTR 22000	Women's Theatre	3
THTR 22200	Playwrights and the Pulitzer Prize	3
THTR 22300	Theatre into Film	3
THTR 22800	Contemporary Latin American Theatre	3
THTR 23200	Black Theatre, U.S.A. I	3
THTR 23201	Black Theatre, U.S.A. II	3
THTR 23600	Acting Realism	4
THTR 23601	Acting the Classics	3
THTR 23602	Auditioning and Acting Professionalization	3
THTR 23700	Tech Theater Practic	3
THTR 23800	Musical Theatre Workshop	3
THTR 23900	Acting for the Camera	3
THTR 24000	Stage Combat	3
THTR 25000	Ballet	3
THTR 25100	Jazz Dance	3
THTR 25200	Modern Dance	3
THTR 25300	Tai Chi	3
THTR 25400	Suzuki/Viewpoints Actor Training	3
THTR 25500	Youth Theatre	3
THTR 26000	Lighting Design	3
THTR 26100	Costume Design	3
THTR 26200	Set Design	3
THTR 30100-30300	Honors	Variable cr.
THTR 33000	Performance Practice	2
THTR 33100	Playwriting	3
THTR 33600	Performance Practice in Film	Variable
THTR 37000	Special Problems in Directing	3
THTR 37100	Special Problems in Playwriting	3
THTR 37200	Special Problems in Technical Theatre and Design	3
THTR 43000	Theatre Workshop	3
THTR 43100	Internship in Theatre	1-3
THTR 43200	New Play Collaborations	3
THTR 45000	Special Topics in Dramatic Literature	3

Subtotal: 41-45

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework, with some adjustments for transfer students. See the General Education Requirements ("Pathways") (p. 286) section of the Bulletin for more information.

Theatre Minor

Requirements for Theatre Minors

Required Courses

THTR 13100	Introduction to Theatre Arts	3
THTR 13600	Beginning Acting	3

PLUS: Nine credits of Elective Theatre Courses, depending on your interests.

Subtotal: 15

Elective Courses

Theatre students are urged to supplement their required courses by studying related subjects in the Theatre Department as well as in other programs and departments, including singing, film and video directing, painting and sculpture, Shakespeare, and literature. They are invited to structure their elective experiences according to Tracks listed on the departmental website.

Advisement

Majors in the Department of Theatre & Speech are expected to maintain a minimum GPA of 2.5. Those who fall below that number will be called in for a conference with a departmental advisor to discuss ways of improving academic performance. The advisor may recommend taking a particular course for better preparation, meeting with a tutor in the Writing Center, taking a course load lower than 15 credits, or other strategies for achieving academic success. All students should try to maintain the highest possible GPA in order to enhance their prospects for acceptance to graduate programs and career opportunities.

Faculty

Robert Barron, Associate Professor and Chair
B.A., Brown University; M.F.A., Yale School of Drama

Keith L. Grant, Professor
B.F.A., University of Utah; M.A., Pennsylvania State University.; M.F.A., Yale School of Drama

Jennifer Holmes, Visiting Assistant Professor
B.A., Vassar College; M.A., Ph.D., New York University

Brandon Judell, Lecturer
B.A., The City College of New York, M.A.

Eugene Nesmith, Professor
B.F.A., The City College of New York; M.F.A., Univ. of California (San Diego); Ph.D., New York University

Kathleen Potts, Assistant Professor
B.A., University of Southern Maine; M.F.A., Columbia University; M.Phil., Ph.D., The Graduate Center, CUNY

Jennifer Tuttle, Assistant Professor
B.A., Northeastern Illinois University; M.F.A., Wayne State University

David Willinger, Professor
B.A., Herbert Lehman College, M.A.; Ph.D., The Graduate Center, CUNY

Professors Emeritus

Steven Urkowitz

Women's Studies Program

(The Colin Powell School for Civic and Global Leadership, formerly the Division of Social Science)

Professor Patricia Ackerman • Program Office: NA 7/133D • Tel: 212-650-7494

Programs and Objectives

The Women's Studies Program offers an interdisciplinary undergraduate minor. The purpose of the program is to engage students in the discovery and production of knowledge that emerges from feminist and

gendered perspectives on culture and society. We seek to provide students with the analytic competency that results from engagement with a curriculum focused on the intersections of gender, race, ethnicity, class, sexuality, and nation and that promotes responsible citizenship in a diverse global environment. The program introduces students to the history of women and their social, cultural and scientific contributions; it stresses the importance of social responsibility, activism, and community outreach. The program supports and sponsors both on and off campus events relevant to women's social, cultural and political issues with a strong sense of commitment to women in local and global contexts. Both curricular and extracurricular activities of the program are grounded in multiple feminisms and interdisciplinary approaches to feminist thought.

Women's Studies Minor

Requirements for the Minor

Required courses

WS 10000	Women's/Gender Roles in Contemporary Society	3
	Elective courses (with approval of the Program director)	12

Subtotal: 15

Events/Activities

The Women's Studies program hosts and co-sponsors Women's History Month, including many exciting talks, films, and activities during March. The program also hosts talks and activities in conjunction with other groups, programs, and college departments, including Art, History and Political Science.

Awards

CCNY undergraduate students are eligible for the following awards:

The Joan Kelly Essay Award

Women Hold up the Sky Award

The Most Outstanding Written Work in WS 10000 Award

Elective Courses in Other Departments

The college offers a variety of courses that are acceptable toward the elective requirements of this minor. A list of such courses is prepared each semester and is available in the program office before registration begins. If you have a question about the acceptability of a course that does not appear on the list, please contact the program office. Failure to receive permission to take courses not appearing on the list may result in that course failing to count toward the graduation requirements.

Faculty

The faculty of the program includes those professors who teach the program's courses and those whose departmental courses may be credited to the minor.

The Bernard and Anne Spitzer School of Architecture

Professor Gordon A. Gebert, Interim Dean • Professor Julio Salcedo-Fernandez, Chair • Department Office: SSA 113 • Tel: 212-650-7118

General Information

The City College offers the following undergraduate degree in Architecture:

B. Arch. (p. 230)

B.S.

Programs and Objectives

The Bernard and Anne Spitzer School of Architecture is deeply committed to creating a just, sustainable, and imaginative future for a rapidly urbanizing planet. Through innovative research and interdisciplinary collaboration, the degree programs in Architecture, Landscape Architecture, Urban Design, and Sustainability in the Urban Environment seek to educate a diverse student body to become engaged professionals, both reflecting and enriching the complex communities of local and global environments. The School acts in the spirit of the City College of New York's historic Ephebic Oath: "To transmit the city, not only not less, but greater, better and more beautiful than it was transmitted to us."

The Architecture program empowers students to design for the betterment of our shared global community. At the School, the only public school of architecture in New York City, our professional B.Arch. program is shaped by the diversity of our students, the inventive research of our faculty, and by multidisciplinary collaborations. We prepare students to become engaged designers and to deploy an expansive set of skills to address pressing social, cultural, environmental, and professional challenges. With a rigorous foundation in the core competencies of building design, history, theory, and technologies, and with an emphasis on agile thinking, the Architecture programs aim to educate the next generation of innovators redefining the role of the architect in the twenty-first century.

The Architecture program leads students through the artistic, technical, intellectual and social process of designing buildings, communities and open spaces. All students are enrolled in this course of study, which leads to the Bachelor of Architecture (the professional degree for licensure) in five years.

A student may elect to obtain the B.S. in Architectural Studies after four years of study. An individual who obtains the 4-year B.S. in Architectural Studies degree at City College may not obtain a Bachelor of Architecture degree at City College.

History

The program in architecture leading to the professional degree was initiated in September 1961, within the School of Engineering and Architecture. In July 1968, a separate School of Architecture and Environmental Studies was created. In September 1971, the Urban Landscape and Urban Design options were added to the programs of the School. The J. Max Bond Center on Design for the Just City evolved from the City College Architectural Center, which was founded in 1980. In 2000, the name of the School was changed to the School of Architecture, Urban Design and Landscape Architecture. With the inauguration of our current building, in 2009 the name was again changed to The Bernard and Anne Spitzer School of Architecture.

Curriculum

The educational program of the School is separated into two interdependent phases. Each phase has a specific emphasis.

In Phase 1 (first, second, and third years), the student is offered a general education in liberal arts and sciences as well as a core curriculum within the School; the core curriculum comprehends architectural design, history of architecture, architectural technology & structures, visual and computational studies. Together, these courses provide essential and varied core competencies that empower the

student to deploy an expansive set of skills to address pressing social, cultural, environmental, and professional challenges.

Phase 2 (fourth and fifth years) is devoted to advance studies in architecture along with the development of the student's independent thinking and interests. Along with electives in and outside of the School, the student participates in Advance Studios. These are design and research laboratories that seek – through specific proposals – to address a range of discreet pressing topics and interests.

Architecture, Bachelor of Architecture (B.Arch.)

Degree Requirements

General Concentration

Concentration in Architectural History (p. 231)

Phase One

First Semester

ARCH 11100	Core Studio I	4
AES 11300	Visual Studies I	2
FIQWS	Freshman Inquiry Writing Seminar	6
MATH 19500	Precalculus	3

Second Semester

ARCH 12000	Core Studio II	4
AES 12300	Visual Studies II	2
AES 21200	The Built Environment of New York City	3
ENGL 21001	Writing for Humanities and the Arts OR	3
ENGL 21002	Writing for the Social Sciences	3
EAS 10600	Earth Systems Science	4

Third Semester

ARCH 23000	Core Studio III	4
AES 23202	Survey of World Architecture I	3
PHYS 21900	Physics for Architecture Students	4
ARCH 35302	Site Technology	3
	Core or College Option	3

Fourth Semester

ARCH 24000	Core Studio IV	4
AES 24001	Portfolio Review	0
AES 24202	Survey of World Architecture II	3
AES 24303	Elementary Structural Analysis & Behavior	3
ARCH 24501	Construction Technology I	3
	Core or College Option	3

**To proceed from the second to the third year in the Architecture program, a student must satisfactorily complete all required courses listed and electives for a minimum of 60 credits (exclusive of all ESL); have a minimum cumulative G.P.A. of 2.33, a minimum G.P.A. of 2.33 in all AES and ARCH courses, complete SPCH 11100 or pass the Speech Exemption Exam, and pass a portfolio review (AES 24001). See advisor for any changes in curriculum.*

Fifth Semester

ARCH 35101	Core Studio V	5
ARCH 35202	Survey of World Architecture III	3
ARCH 35501	Construction Technology II	3
ARCH 35402	Introduction to Design of Timber & Masonry Structures	3

	Core or College Option	3
Sixth Semester		
ARCH 36101	Core Studio VI	5
ARCH 47202	Survey of World Architecture IV	3
ARCH 36501	Construction Technology III	3
ARCH 36402	Introduction to Design of Steel & Concrete Structures	3
	Core or College Option	3

Phase Two

Seventh Semester		
ARCH 51000	Advanced Studio	6
ARCH 45501	Computation and Design Elective	3
	Core or College Option	3

Eighth Semester		
ARCH 51000	Advanced Studio Electives	6 9

To proceed to the 5th year a design portfolio and a fifth year project statement proposal must be approved. The student must have maintained a 2.33 G.P.A. overall and a 2.33 G.P.A. in all Architecture courses.

Phase Three

Ninth Semester		
ARCH 51000	Advanced Studio	6
ARCH 51200	Architectural Management Electives	3 8

Tenth Semester		
ARCH 51000	Advanced Studio Electives	6 9

Note on electives: In order to complete the Bachelor of Architecture a student must successfully complete all required Architecture courses as well as a remainder 35 credits of General Education Requirement "Pathways" and 29 credits of electives; consisting of 17 credits of architecture electives and 12 credits of non-architecture electives in any area of study at advanced level (20000 or above), with the exception of foreign language courses which can be taken at the introductory level. Prior to fourth year, at least two of the four elective courses are to be completed within the undergraduate offerings of the Spitzer School of Architecture. For students in the concentration in "Architectural Theory and History," 15 of the 17 credits of architectural electives must be taken from the list of designated "Elective Course Options".

Total Credit Hours: 160

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework (B. Arch Students complete 7 of these credits as required core courses), with some adjustments for transfer students. See the General Education Requirements (Pathways) section of the Bulletin for more information. Students in the School of Architecture will satisfy their "Pathways" requirements most efficiently by following these recommendations:

- Fixed Core English Composition I: FIQWS (WCGI with Literary emphasis)
- English Composition II: ENGL 21001 or 21002 or 21003 or ART 21000
- Mathematical and Quantitative Reasoning: MATH 19500 (Pre-calculus)
- Life and Physical Sciences: EAS 10600

Flexible Core

- World Cultures and Global Issues: any of CLAS offerings in WCGI with Cultural/Historical emphasis
- World Cultures and Global Issues: topic section of WCGI FIQWS with Literary emphasis

- Individual and Society: any of CLAS offerings in this category
- U.S. Experience in its Diversity: AES 212
- Creative Expression: any of CLAS ART offerings
- Scientific World: PHYS 21900

- College Option
- Speech 11100, 00380 or exemption on the basis of demonstrated proficiency
- Philosophy 10200
- AES 23202
- AES 24202

Architecture, Concentration in Architectural History and Theory

Requirements for the Concentration

Please see the Architecture General Concentration requirements for the non elective degree requirements. (p. 230)

The Department of Architecture offers a concentration in architectural history. This is comprised of 15 elective credits drawn from architectural history electives in addition to the four architectural history courses required for the B. Arch degree, Survey of World Architecture I through Survey of World Architecture IV.

Elective Courses

The Department of Architecture offers a concentration in architectural history and theory. This is comprised of 15 elective credits drawn from architectural history electives in addition to the four architectural history courses required for the B Arch degree, Survey of World Architecture I through Survey of World Architecture IV.

ARCH 51289	Visualization and the Politics of Representation*	3
ARCH 51290	The Festival Architecture and Collective Events*	3
ARCH 51291	History of the European City*	3
ARCH 51304	Architectural Literacy*	3
ARCH 51309	Children and the City*	3
ARCH 51320	History of Structural Forms*	3
ARCH 51325	Critical Theory*	3
ARCH 51326	Reading African Architecture*	3
ARCH 51331	The Wonder of Medieval Architecture*	3
ARCH 51345	Latin American Architecture*	3
ARCH 51347	Urban Cartography*	3
ARCH 51353	World Cities: Re-Orienting Towards The East*	3
ARCH 51401	Gaudí and the Architectural Culture of the Fin de Siècle*	3
ARCH 51408	Histories of Modern Urban Infrastructure*	3
ARCH 51414	Contemporary Architecture*	3
ARCH 51420	Gender, Space, and Architecture*	3
ARCH 52345	Techniques of Urban Analysis * Plus additional 'special topics' courses when offered	2 3
	Graduate Electives open to qualified undergraduates	3
ART 87500	Architecture and Urbanism in the U. S. since 1945*	3
LAAR 62200	History and Theory of Landscape Architecture I	3
LAAR 63200	History and Theory of Landscape Architecture II*	3
UD 63101	Reading the American City*	3
UD 62002	Suburbia and Its Discontents* Plus additional 'special topics'	3 3

courses when offered

*Courses with an asterisk are Special Topics courses.

Note on electives: In order to complete the Bachelor of Architecture a student must successfully complete all required Architecture courses as well as a remainder 35 credits of General Education Requirement "Pathways" and 29 credits of electives; consisting of 17 credits of architecture electives and 12 credits of non-architecture electives in any area of study at advanced level (20000 or above), with the exception of foreign language courses which can be taken at the introductory level. Prior to fourth year, at least two of the four elective courses are to be completed within the undergraduate offerings of the Spitzer School of Architecture. *For students in the concentration in "Architectural Theory and History," 15 of the 17 credits of architectural electives must be taken from the list of designated "Elective Course Options".*

General Education Requirements ("Pathways")

In general, students are required to complete 42 credits of General Education coursework (B. Arch Students complete 7 of these credits as required core courses), with some adjustments for transfer students. See the General Education Requirements (Pathways) section of the Bulletin for more information. Students in the School of Architecture will satisfy their "Pathways" requirements most efficiently by following these recommendations:

Fixed Core English Composition I: FIQWS (WCGI with Literary emphasis)

English Composition II: ENGL 21001 or 21002 or 21003 or ART 21000

Mathematical and Quantitative Reasoning: MATH 19500 (Pre-calculus)

Life and Physical Sciences: EAS 10600

Flexible Core

World Cultures and Global Issues: any of CLAS offerings in WCGI with Cultural/Historical emphasis

World Cultures and Global Issues: topic section of WCGI FIQWS with Literary emphasis

Individual and Society: any of CLAS offerings in this category

U.S. Experience in its Diversity: AES 212

Creative Expression: any of CLAS ART offerings

Scientific World: PHYS 21900

College Option

Speech 11100, 00380 or exemption on the basis of demonstrated proficiency

Philosophy 10200

AES 23202

AES 24202

Subtotal: 160

Total Credit Hours: 160

Research

At the J. Max Bond Center on Design for the Just City, we believe that design can have a positive impact on urban reform in our nation's cities. Founded in 2011, the Bond Center is dedicated to the advancement of design practice, education, research and advocacy in ways that build and sustain resilient and just communities, cities and regions. The Center fosters collaboration and innovation by working with faculty, researchers, students, policy-makers, community leaders and practitioners representing the four disciplines of the Spitzer School – architecture, landscape architecture, urban design and sustainability – in order to apply expertise and intervention to a wide variety of contemporary problems, challenges, and opportunities facing urban America.

Selected Awards, Scholarships and Honors

Alumni Association Scholarships
 Architecture Alumni Group Scholarship
 Megan Lawrence Memorial Award
 Fred L. Leibman Book Award
 Most Outstanding Student Awards: Years 1 – 5
 Faculty History and Theory Award
 Extech Award
 Bernard L. Spanier Scholarship Fund
 Ecole D'Art de Fontainebleau Scholarship
 AIA/Architectural Foundation Scholarship
 AIA/New York Chapter Eleanor Allwork Award
 AIA/Certificate of Merit
 Carol J. Weissman Kurth Women in Architecture Scholarship
 Matthew W. Del Gaudio Award
 AIA Henry Adams Award
 Alpha Rho Chi Medal
 J. Max Bond Award
 Gerner, Kronick & Valcarcel Scholarship
 Ennead Architects Scholarship
 WX Women in Real Estate Scholarships
 Bernard and Anne Spitzer Tuition Scholarships
 Frank J. Sciame Jr Design Scholarship

Student Organizations

The American Institute of Architecture Students (AIAS)
 National Organization of Minority Architecture Students (NOMAS)
 Digital Architectural Students Club (DASC)
 AIAS Freedom by Design

Accreditation

In the United States, most registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit professional degree programs in architecture offered by institutions with U.S. regional accreditation, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted an eight-year, three-year, or two-year term of accreditation, depending on the extent of its conformance with established educational standards.

Doctor of Architecture and Master of Architecture degree programs may require a pre-professional undergraduate degree in architecture for admission. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

The City College of the City University of New York, Bernard and Anne Spitzer School of Architecture offers the following NAAB-accredited degree programs:

B. Arch. (160 undergraduate credits)

M. Arch. (non-professional degree + 108 credits)

Next accreditation visit for all NAAB-accredited programs: 2017
The five-year professional degree (Bachelor of Architecture) is registered by the New York State Education Department.

Students may not register for two sequential courses simultaneously in Architectural Studio, History/Theory, or Construction Technology, unless they have been granted permission by an Academic Advisor in consultation with course faculty.

If the student wishes to drop a course that is a corequisite of another course, both must be dropped.

Admissions

Freshmen

For information about academic requirements, application procedures, placement examinations and special admissions programs, (p. 144) consult the front of this *Bulletin*.

Changing Majors within the College

Students at City College who want to change their major to architecture must apply to the School of Architecture. A limited number of applicants may be accepted each year.

Transfer and Previous Degree Students

Students with previous college course work or degrees may be exempted from some of the required and elective general education courses. An evaluation of a student's transfer credits is made by the Spitzer School advisement. Those wishing to apply must complete a CUNY Transfer Application. Once accepted students are individually evaluated on the basis of past academic work. A portfolio is required only for those who previously studied architecture.

Applicants from Other Institutions

Applicants who have earned a B.S. degree in Architecture at another institution should submit a transfer student application. Accepted applicants will be asked to present a portfolio containing examples of their work. Placement in studio is based on portfolio evaluation.

Registration and Advisement

Pre-Registration

All Architecture students must see an academic advisor before registration. At these times, advisors will consult on matters of registration, program, credits, academic standing, or personal problems related to the student's professional career.

Program Planning Procedures

Entering freshmen are advised by an advisor in the School of Architecture. At the advisement session, they prepare a program for the coming semester. The approval of an advisor is required for any change in an approved curricular program.

Most courses offered by the School are part of a sequence. Since every course in this *Bulletin* is not offered every semester, students should be careful to plan programs that can be completed in the required number of semesters.

Depending on prior coursework and or math placement, a student may be required to complete the prerequisite sequence Math 19000 to Math 19500.

Most courses offered by the School have prerequisites, which are listed immediately after the course descriptions. The prerequisites must be successfully completed before the course that requires them can be taken.

During Phase 1, students with an overall average of 2.33 and a 2.33 in professional courses and a successful portfolio review are permitted to proceed from second year to third year. During Phase 2, all students are required to submit an acceptable portfolio at the beginning of the second semester of fourth year.

Students who have earned a B average in the preceding term, and who have no grade below a C in any subject studied that term, may be permitted to take more than 17 credits.

Students are expected to attend the School full-time and carry a minimum of 12 credits.

Students are responsible for seeing that they complete all requirements necessary for graduation. Students are also responsible for informing the Office of the Registrar if at any time they have reason to believe their records are incorrect.

Students who suspend their studies must apply for re-entry.

Advisement

Architecture

Mr. Arnaldo Melendez
SSA 132; 650-7307

Ms. Sara Morales
SSA 133; 650-8748

Facilities

The Library

The Architecture Library contains more than 30,000 volumes related to the programs of the School. It currently receives 70 periodicals, and has a collection of 11,000 pamphlets and pictures. Public workstations in the library offer web access. The Morris Raphael Cohen Library and the Science/Engineering Library are also available for student use. Professor Nilda Sanchez-Rodriguez is the Chief Librarian of the Architectural Library.

The Model Shop

Students use the shop to make models that enable them to study design solutions in three dimensions and to analyze construction details and methods. The shop is equipped with laser cutter and CNC equipment as well as hand and power tools for wood and plastic. Instruction is provided in the use of equipment. Use of the shop is integral to the design curriculum, beginning with the first year studio.

Visual Resources Library

The Visual Resources Library is a reference collection of over 60,000 slides as well as a rapidly growing collection of digital images. It also includes facilities for photographing models and drawings and other

equipment for recording or viewing architectural projects. Professor Ching-Jung Chen is the Art and Architecture Visual Resources Librarian.

The Digital Labs

The Digital Labs, housed in large central spaces in the School, provide students with a variety of networked computer equipment for carrying out graphic and design and building modeling projects. Advanced software for drafting, drawing and rendering as well as other applications are available. The labs are also used for teaching the various computer courses offered in the School.

Faculty

Ahu Aydogan Akseli, Assistant Professor

B.Arch., Uludag University, M.Arch., M.S. Izmir Institute of Technology; M.S., Ph.D. Rensselaer Polytechnic Institute

Jacob Alspector, Associate Professor
B.Arch., The Cooper Union

Nandini Bagchee, Assistant Professor
B.Arch., Cooper Union; M.S. in Architecture, M.I.T.; R.A.

Cesare Birignani, Assistant Professor
Ph.D., Columbia University

Hillary Brown, Professor and Director of M.S. in Sustainability
B.Arch., Oberlin College, M.Arch., Yale Univ.; FAIA, LEED AP

Lance Jay Brown, Professor
B.Arch., Harvard Univ., M.Arch. (Urban Design); R.A., A.I.A., A.C.S.A.

Mi-Tsung Chang, Assistant Professor
B.Arch., Pratt Institute, M.Arch.; Ph.D., Union Institute

Jeremy Edmiston, Associate Professor
B. Arch., Univ. of Technology (Australia); M.S., Columbia Univ.

Alan Feigenberg, Professor
B.A., Univ. of Pennsylvania; M.Arch., Columbia Univ.; R.A.

Gordon A. Gebert, Professor and Interim Dean
B.Arch., M.I.T.; M.Arch., Princeton Univ.; R.A.

Peter A. Gisolfi, Professor
B.A., Yale Univ.; M.Arch., M.L.A., Univ. of Pennsylvania; R.A.; R.L.A

Marta Gutman, Professor
B.A., Brown Univ.; M.Arch., Columbia Univ.; Ph.D., Univ. of California (Berkeley)

Denise Hoffman-Brandt, Associate Professor and Director of M.L.A.
B.A., Univ. of Pennsylvania; M.F.A., Pratt Institute; M.L.A., University of Pennsylvania

Bradley Horn, Associate Professor and Director of M.Arch
B.Arch., The Cooper Union; M.Arch., Columbia Univ.; R.A.

Fran Leadon, Associate Professor
B.Arch., Univ. of Florida; M.Arch., Yale Univ.

Fabian Llonch, Associate Professor
M.Arch., Univ. of Washington

Frank Melendez, Assistant Professor
B.A., University of Arizona, M.Arch., Yale Univ.

Dominick Pilla, Associate Professor
B.A., Rensselaer Polytechnic Inst., M.S., Civil Engineering, New Jersey Institute of Tech.

George Ranalli, Professor
B.Arch., Pratt Institute; M.Arch., Harvard Univ., R.A.

Julio Salcedo-Fernandez, Associate Professor and Chair
B. A., Rice Univ.; M. Arch., Harvard Univ.

Catherine Seavitt Nordenson, Associate Professor
B.S., University of Michigan, B.S. Landscape Architecture, CCNY, B.Arch., Cooper Union, M. Arch., Princeton University

Michael Sorkin, Distinguished Professor
B.A., Univ. of Chicago; M.A., Columbia Univ.; M.Arch., M.I.T.

Elisabetta Terragni, Associate Professor
M.Arch., Facolta di Architettura, Politecnico di Milano

Christian Volkmann, Associate Professor
Dipl. Arch. ETH, Eidgenossische Technische Hochschule (Switzerland)

Sean Weiss, Assistant Professor
B.A., Honors in Art History, Vassar College; Ph.D., Art History, Graduate Center, CUNY.

June P. Williamson, Associate Professor
B.A., Yale Univ.; M.Arch., M.I.T.; M.U.P., The City College of New York

Visiting Faculty (2012 - Present)

Karen Bausman

Ann Beha

Sara Caples

Yolande Daniels

Brian Healy

John Hong

Carla Juaçaba

Judith Leclerc

Audrey Matlock

Michael Meredith

Jinhee Park

Shawn Rickenbacker

Luis Rojo

Joseph Tanney

Claire Weisz

Professors Emeriti

Jonathan Barnett

Carmi Bee

Horst Berger

R. Alan Cordingley

William Ellis

M. Paul Friedberg

David E. Guise

Ghislaine Hermanuz

James B. Jarrett

Hanque Macari

Garrison McNeil

M. Rosaria Piomelli

Labelle Prussin

William Roehl

Donald P. Ryder

Bernard P. Spring

Achva Benzinberg Stein
Lee Weintraub

The School of Education

Dr. Gretchen Johnson, Interim Dean • Office: NA 3/203 • Tel: 212-650-5345

The School of Education, an outgrowth of the extension courses organized in the fall of 1908 for teachers, librarians, and social workers, was established as a separate school of The City College in the spring of 1921. It is organized under its own faculty to prepare men and women for various educational services, teaching and non-teaching, in day care/pre-school settings, as well as in the elementary and secondary schools and with adults. It is also open to in-service personnel who wish to take courses for professional development.

The City College is accredited by the Middle States Association of Colleges and Secondary Schools. The teacher education program of the College prepares pre-school, elementary, middle school, and secondary teachers. The School of Education is accredited by the National Council for Accreditation of Teacher Education (NCATE) and all of its programs are state approved. Additionally, the School of Education is affiliated with the American Association of Colleges for Teacher Education.

In collaboration with the other Schools and Divisions of The City College, the School of Education offers programs of study in a number of professional fields. Professional preparation for educational service is under the jurisdiction of the Board of Trustees of the City University of New York and coordinated by its Committee on Coordination of Teacher Education.

The programs lead to the degrees of Bachelor of Science and Bachelor of Science in Education. The School also offers an education concentration, including student teaching, to a large number of liberal arts degree candidates seeking state certification in certain secondary school teaching areas. Programs of study are designed to meet state certification and New York City licensing requirements. Candidates who obtain the bachelor's degree may, upon graduation, apply for NYS teacher certification electronically, using the TEACH Online Services application system. Instructions for using the system are available from the CCNY certification website at <http://www1.ccnycuny.edu/prospective/education/index.cfm>. Candidates must also indicate to the CCNY School of Education Certification Officer that they wish to be recommended for certification.

Mission and Shared Vision of the School of Education

In keeping with the historical mission of the College, the School of Education provides access to the field of education for all those who show promise of contributing to New York City schools and the education of the City's children, regardless of national origin, home language, or economic condition.

The preparation of teachers in the United States is intended to meet the needs of a democratic society. In New York City, this is extended to preparing educators to work with students who are diverse in all respects. To that end, the School seeks to draw on the varied strengths of candidates while ensuring that they acquire the academic, pedagogical, technological, professional, and personal skills required of an educator in an urban setting. The School commits itself to ensuring that its graduates can demonstrate solid grounding in the liberal arts and sciences, a deep understanding of public purposes of education in a democracy, thorough training in effective teaching skills, and the professional and affective dispositions to work successfully with students, families, and colleagues in the field.

The School focuses on five themes to insure coherence across its curriculum, instruction, field experience, and assessment:

- A. Developing In-depth Knowledge about the World
- B. Becoming Skilled, Reflective Practitioners
- C. Educating for and about Diversity
- D. Nurturing Leadership for Learning
- E. Building Caring Communities.

A. Developing In-depth Knowledge About the World

Candidates preparing to work in schools in teaching or supervisory roles demonstrate the content knowledge and skills necessary to help all students learn. All the College's programs attempt to meet national and professional standards of content, rigor, and coherence. This knowledge is found in the liberal arts and sciences and is presented with the most up-to-date technology. Indeed, there is a consensus of educators, from progressives to traditionalists, that literature, history, philosophy, mathematics, natural science, foreign languages, and art and music must be part of a university curriculum.

To that end, the institution requires a core curriculum emanating from its College of Liberal Arts and Science. The School adopts and enhances this curriculum by requiring of its candidates additional math and science courses. Undergraduate candidates, in addition to their pedagogical courses, must complete an academic major or concentration. In addition to these requirements, pedagogical courses echo the content of the liberal arts core and concentrations. History, mathematics and English are part of these courses.

Content knowledge is demonstrated in teaching methods courses: e.g. language arts, social studies, math and science. In these courses, candidates are introduced to State learning standards at the level appropriate to the certification they seek. Through the use of content knowledge, candidates must be able to determine the widest and deepest potential knowledge base of each of their students with the accompanying strategies that range from direct instruction to inquiry so the student can, from textual and electronic sources, obtain, rehearse, recall, and transfer new knowledge to routine and new learning contexts. Knowledge of students and pedagogy goes hand-in-hand with content knowledge.

The seven knowledge areas of a university curriculum, listed above, have value in themselves, a value that education and liberal arts faculty communicate, deliberately and in passing, even in pedagogical courses. These faculties work together on curriculum and search committees. Only if they share and transmit the value of these knowledge areas will candidates develop a disposition to continue experiencing these and participate in lifelong learning. If they are not disposed to recognize this value they will not be able to pass it on to their students.

The target for teacher and other professional candidates with regard to content includes in-depth knowledge of the subject matter to be taught or supervised including the methods of the discipline that determine what becomes knowledge. Candidates demonstrate this knowledge through inquiry, critical analysis, and synthesis of the subjects they plan to teach. Some are able to meet target levels of performance by graduation from the programs of the School. Others, at that point in their development as educators, meet, at least, acceptable levels. But all graduates have the basic tools, technology and necessary dispositions to continue their development as educational professionals as well as learners. In order to ultimately meet target levels of performance, our graduates will have to continue to develop their content as well as their professional knowledge.

B. Becoming Skilled, Reflective Practitioners

Teacher competence is obviously a primary influence on student learning. Critical dimensions of competence are pedagogical knowledge and skills. The School of Education adds to this the knowledge and skills to be a successful educator in urban schools that serve a diverse population of children and families and the disposition to use these to promote the learning of all children. In order to articulate the School's purposes and goals, pedagogical competence is divided into six subcategories:

1. Knowledge of human learning and development. In coursework, candidates build their pedagogical knowledge on a foundation of learning and developmental theory in tandem with practice in fieldwork. Candidates observe students in an educational and cultural context.
2. Knowledge of constructivism and inquiry learning. In coursework and fieldwork, candidates learn how to provide students with opportunities to explore, inquire, discover, and problem-solve. Candidates apply knowledge by gradually implementing a wider range of instructional practices in the field with diverse groups of students.
3. Knowledge of pedagogical approaches to working with students with special needs. Candidates, whether in special education or not, recognize that they may be called upon to work in inclusion classrooms and engage in culturally responsive teaching. As well as experiencing constructivist and inquiry models, candidates investigate complementary models for students with special needs.
4. Knowledge of the use of instructional technology for teaching, learning, and assessment. The School promotes the skillful use of instructional and communications technology with a predominantly "across the curriculum" approach based on the recognition that technology must be used to support student learning.
5. The knowledge and ability to put into practice both multiple teaching strategies and approaches to assessment that build on the knowledge and strengths that students bring to school and allow for differentiated instruction for diverse learners. Based on their knowledge and experiences with cultural differences, candidates integrate multiple strategies in the preparation of lessons and fieldwork. They are introduced to formal and informal assessment approaches in foundation courses and in succeeding course and fieldwork experiences, become comfortable with a wide range of assessment strategies.
6. Application of knowledge and skills through sequenced experiences in the field. Through sequenced fieldwork, candidates grow in their ability to apply the skills and knowledge learned. Fieldwork culminates in a carefully monitored semester of student teaching or a practicum in which they engage in a formal inquiry into their teaching practice.

C. Educating for and about Diversity

The great strength of City College is the diversity of its students and faculty. As a public institution, the College has in place a policy of nondiscrimination on the basis of age, color, disability, national or ethnic origin, race, religion, sex, sexual orientation, veteran or marital status. As a campus situated at the center of one of the world's most diverse metropolises, the College enjoys the opportunity of making that policy a living reality.

The School of Education subscribes wholeheartedly to the goal of full inclusion and so works continuously to ensure that the diversity of the New York City population, and particularly of the surrounding local community of upper Manhattan, is reflected in the make-up of the faculty and in the perspectives, concerns, and materials taken up throughout the curriculum. Access to education and to careers in teaching for the widest possible representation across the City's population is central to the School's mission but, at the same time, a wider variety of educational options is often available to the economically more advantaged. In this light, the School and the College seek especially to provide access to those who are economically disadvantaged. Mechanisms to provide such access include low tuition,

financial aid, academic support services, and scheduling of classes to accommodate students who work.

The School views the diversity of students and faculty, defined in its widest sense, not just as an obligation but as an educational resource. While an emphasis on multiculturalism does prepare learners for the diversity of the world outside the classroom, a diverse classroom actually brings that reality into the educational process itself. In a true community of learners, where each member contributes to the learning process, it must be the case that greater diversity of lived experience among the learners results in a richer learning experience for the community. For the School of Education candidate, diversity is more than a fact of the world, something about which the candidate must learn; it is a fact of the candidate's own classroom, something through which the candidate can learn. It is the responsibility of faculty to draw upon the diversity of the school to enrich the learning processes of all candidates, a practice that serves as a model for candidates in their own teaching.

The School is continuously working towards finding ways to promote understanding across experiential divides. Particularly where native cultures, languages, and dialects differ from candidate to candidate, candidate to instructor, and faculty member to faculty member, it is a challenge to appreciate and accurately assess the value of another's contribution. It is also a challenge to prepare candidates to meet the demands of state and professional assessment instruments, which may not always be sufficiently sensitive to cultural and linguistic differences. The School strives to meet these demands without sacrificing either academic rigor or cultural and linguistic pluralism.

D. Nurturing Leadership for Learning

1. General preparation. Our goal is to develop the capabilities of candidates to assume leadership roles in their classrooms, schools, and communities. Whether or not candidates eventually assume formal leadership positions, the acquisition of the knowledge, skills, technology, and dispositions required for providing leadership serves to enhance their performance at the classroom, school, and community levels. Accordingly, developing the capacity to apply leadership skills that foster the development of community in multicultural, multilingual schools is a theme that is embedded and reinforced in the course content, fieldwork, research requirements, and internship experiences offered by all the programs in the School.
2. Candidates acquire the ability to lead and participate in decision-making bodies that address the academic content and management structure of the diverse programs in their schools. They are prepared to engage in collaborative processes that encourage the mutual efforts of teachers, administrators, and staff to work and learn together. They become skilled at collegial planning and evaluation, managing conflict, and reflecting and dialoging on their own professional practices. They seek to become stewards of best practice and, by so doing, feel a responsibility for the whole School and not just the classroom.
3. Preparing candidates for formal leadership positions. Candidates learn to lead through the co-creation of a shared vision, values and goals. To accomplish this, they learn to build consensus, manage conflict, and clearly communicate the importance of the shared vision and values on an ongoing basis. They learn to create and maintain a culture of cooperation and collaboration which has teaching and learning as its central focus. They develop the value of empowering teachers and staff to act on their own ideas by involving them in decision-making processes and encouraging them to think of themselves as leaders. They demonstrate commitment to and sensitivity and respect for diverse cultures served by school communities.
4. Faculty in the leadership preparation programs utilize case study methodology, problem-based learning, and cooperative learning strategies to prepare candidates to understand the process of developing and articulating a vision and its related goals, to acquire the skills and dispositions needed to relinquish authority to teachers and staff, to appropriately involve others in decision-making

processes, to delegate authority, and to share credit with others for the successes enjoyed by a school or other institutional unit.

E. Building Caring Communities

Community-building must be at the heart of any school improvement effort. Caring communities are places where teachers and children support and celebrate each other's learning and general well-being. The School, in order to help candidates begin this career-long endeavor, focuses on the creation of democratic classrooms and schools and teachers' roles as models of caring, values, and moral behavior.

1. Democratic classrooms and schools. Candidates come to understand what democratic classrooms and schools look like and what values they have. Faculty strive to be examples, not as transmitters where their voices dominate, but as co-intentional learners, coaches, and facilitators. Beyond modeling faculty explore with candidates the dynamics of democratic classrooms and emphasize why they are important. They emphasize the connection between public education and caring citizens equipped to make judgments as they participate in the decision-making processes of society.
2. Teachers as models of caring, values, and moral behavior. All teachers need to know their students well and, to the extent possible, personalize instruction and provide advice, nurturing, and counseling when needed. Faculty of the School, therefore, need to know candidates well and help them identify ways to know their students and to express interest in and caring for them. Candidates need to remember details about students' lives, keep notes, call and visit their homes, respond authentically, and ask students what they think and care about. Most of all, candidates need to learn that being a caring teacher is not playing a role. They must be authentic persons before they are caring persons. To be authentic in front of students leaves one vulnerable, and candidates need to be able to deal with that vulnerability.
3. Candidates, therefore, learn how classrooms and schools become caring communities and how they become more democratic. They understand behaviors and forces that militate against caring, democratic classrooms. They exhibit caring and democratic behaviors in their education classes. Finally, they will define the values their classrooms will support and understand how these values will contribute to the building of character in their students.
4. The School continually reviews and evaluates all undergraduate and graduate programs, including the objectives, content, and learning activities of individual courses. Experimentation is sought in all aspects of the program. Through required courses, counseling, experience in community agencies, and in affiliated and other schools, students are prepared to fill their role as urban teachers.

Officers of the Administration

Interim Dean

Prof. Gretchen Johnson
NA 3/203, 212-650-5345

Interim Associate Dean

Prof. Edwin M. Lamboy
NA 3/213, 212-650-6243

Assistant Dean of Enrollment and Student Services

Ms. Stacia Pusey
NA 3/223A, 212-650-5316

Department of Teaching, Learning, and Culture, Chair

Prof. Amita Gupta
NA 6/207B, 212-650-7897

Department of Leadership and Special Education, Chair

Prof. Hazel Carter
NA 6/207B, 212-650-6264

Department of Secondary Education, Interim Chair

Prof. Hazel Carter
NA 6/207B, 212-650-6264

Office of Clinical Practice, Field Experiences and Student Teaching, Director

Dr. Bruce Billig

NA 6/207A, 212-650-6915

Certification Office, Certification Officer

Ms. Margaret Schehl

NA 3/213, 212-650-5590

Undergraduate Programs

Early Childhood Education (p. 243) (see Department of Interdisciplinary Arts & Sciences)*

Childhood Education (p. 242)

Bilingual Childhood Education (Chinese, Haitian, Spanish and other languages) (p. 242)

*Students interested in Early Childhood Education should contact the Center for Worker Education at 25 Broadway, New York, NY 10004 (212) 925-6625, extension 241.

Secondary Education Concentrations

Arts Education (p. 245)

English Education (p. 245)

Mathematics Education (p. 245)

Music Education (p. 245)

Science Education: Biology, Chemistry, Earth Science and Physics (p. 245)

Social Studies Education (p. 245)

Spanish Education (p. 245)

Undergraduate Admissions

For information about academic requirements, application procedures, placement examinations, and special admissions programs, (p. 144) consult the back of this *Bulletin* or go to the Office of Admissions and Student Services in NAC 3/223A.

Prospective childhood education and bilingual childhood education candidates must apply for admission to the School of Education through the Office of Admissions and Student Services, NA 3/223A. The criteria for admission are:

1. Pass the School of Education Admissions Test (S.E.A.T.) administered by the School of Education through the Office of Student Services;
2. Complete a satisfactory interview and on-site essay with program faculty.
3. City College GPA of 2.5 or higher;
4. Pass the School of Education Admissions Test (S.E.A.T.) administered by the School of Education through the Office of Student Services;
5. A minimum of 45 credits. Twelve credits must be completed at CCNY with at least three credits in Education.

Prospective secondary education candidates must meet the requirements above. In addition, they must have a City College GPA of 2.7 or higher and a GPA of 3.0 in their major.

Those who plan to teach art, music or any secondary school (middle or senior high school) subject are enrolled in the College of Liberal Arts and Science and follow a program leading to either a B.A. or B.S. degree. These candidates will take the education sequence as a concentration in Education under the guidance of both education and liberal arts advisors. Candidates wishing to pursue a concentration in secondary education must apply for admission in the Office of Admissions and Student Services, NA 3/223A. They must meet the requirements for the concentration in Education, in addition to the requirements of the individual liberal arts programs.

In general, credit for courses completed with a grade of C or better will apply to the Education program. No credit will be granted for courses in which the lowest passing grade (usually "D") was obtained. No credit may be given in excess of the number of credits actually earned in a course, or in excess of the number of credits listed for the comparable course in the CCNY curriculum.

Maintenance of Matriculation

As a professional school with the responsibility of recommending candidates for New York State certification, the School of Education must conduct ongoing professional assessment of all candidates. In cases where a faculty member determines that an individual is inappropriate for the teaching profession, he/she may recommend removal from the teacher preparation program to the chair of the department. The student has the right to appeal to the Committee on Course and Standing. The findings of the Committee are final.

Liberal Arts Core Requirement

All candidates in the School of Education are required to complete a Core of liberal arts courses. Credit is given only for courses completed with a grade of "C" or better. Candidates planning to specialize in secondary education generally choose a major in the liberal arts, and fulfill the Core requirements appropriate to that major.

For childhood and bilingual childhood education majors the Core requirements are outlined below. Early Childhood Education majors should refer to the Department of Interdisciplinary Arts and Sciences section of this Bulletin. For further information on Core requirements, candidates should consult their academic advisors. All courses that are offered by specific departments within the College of Liberal Arts and Science are described in this Bulletin.

The following Core courses are required for childhood education and bilingual childhood education (B.S.Ed.) majors. Note that not all Pathways courses meet New York State Department of Education requirements for certification. Candidates should see an advisor for more information.

Liberal Arts Core Requirement

Required Core (12)

English Composition (6 crs: 3 crs English composition + 3 crs toward FIQWS Flexible Core) 3 (+3) credits

English Composition 3 credits

Math & Quantitative Reasoning 3 credits

Life & Physical Sciences 3 credits

Flexible Core (18)

World Cultures & Global Issues 3 credits

World Cultures & Global Issues 3 credits

U.S. Experience in Its Diversity 3 credits

Creative Expression 3 credits

Individual and Society 3 credits

Scientific World 3 credits

College Option (12)

SPCH 11100 Foundations of Speech Communication 3

EDCE 20000 Inquiry in Education 3

EDCE 20600 Observing Children and Their Development 3

EDUC 22100 Urban Schools in a Diverse American Society OR 3

EDUC 22200 Schl Amer Soc Blnq 3

SPCH 11100: The Speech Examination is a College requirement. Students in the School of Education meet this requirement by taking SPCH 11100 or passing an exemption examination.

EDUC 22200: Bilingual Childhood Education Majors Only

Modern Language

Competence in a second language is required of B.S.Ed. degree candidates. The sequence is designed to give candidates oral competency in the language and also to familiarize them with the diversity within the New York City student population. Candidates who have had three years of a foreign language in high school will meet the language requirement. When less than three years were taken in high school, candidates are required to take additional coursework at the college. Candidates who have a satisfactory speaking knowledge of a second language may be exempted from these courses by passing an oral competency test given each semester by the Department of Classical and Modern Languages and Literatures. Candidates may apply for the test in NA 5/223.

Candidates for the B.S.Ed. degree in Childhood Education must successfully complete three years of a language other than English in high school or two semesters in college: SPAN 19300 and/or 19400 (Heritage Speakers); SPAN 12300 AND 12400 (Non-Heritage Speakers); or equivalent courses in another language.

Candidates for the B.S.Ed. degree in Bilingual Childhood Education must successfully complete a 300-level language course (SPAN 32100, 32200, or 37300, or equivalent course in another language). Depending on the results of their placement exam, some candidates may need foundation courses: SPAN 19300 and/or 19400 (Heritage Speakers);

SPAN 12300, 12400 or 22600 (Non-Heritage Speakers); or equivalent courses in another language before they enroll in the required 300-level course.

Liberal Arts Major Requirements

New York State requires that individuals seeking childhood and adolescent teacher certification have completed a liberal arts major in addition to their preparation in education. For those who wish to teach in secondary schools, this is a major in the teaching area. Those wishing to teach in the elementary school may complete a traditional liberal arts major (American studies, art, economics, English, history, music, political science, psychology, sociology, Spanish) or they may complete a special interdisciplinary major designed specifically for those preparing to be elementary teachers. There are nine interdisciplinary concentration areas: biology, earth science, chemistry, mathematics, elementary mathematics, theater in its cultural context, art in its cultural context language and literature, and social studies. Those preparing to be elementary school teachers should consult with an advisor to select an appropriate liberal arts major.

Additional Requirements

1. Professional development seminars in child abuse identification, school violence prevention and Dignity for All Students (DASA) training (EDUC 41900).

Medical Examination

The nature of a teacher's work requires especially good health. Therefore, all candidates students must arrange to have a medical examination prior to fieldwork and student teaching placements; also, they must inform the School of Education of any significant or possibly disabling illness as soon as they become aware of it.

A person with physical conditions which are likely to lead to frequent absences, or who might be unable to cope with emergency situations in a school, will only be admitted when given a clearance by the New York City Public Schools Medical Examiner.

All candidates are required to have a tuberculin skin test. The forms for the test results are available in the Wellness and Counseling Center (MR 15). Candidates must make their own arrangements for the tuberculin test. They may be examined by their own private physician, by a physician on the staff of a hospital, or at the City College Wellness and Counseling Center. The completed form should then be brought to the Office of Clinical Practice, where the candidate will be given a copy if needed.

Professional Dispositions

While physical fitness, knowledge of the subject area, and the ability to use English (and the second language, in the case of bilingual childhood education majors) skillfully in writing and speaking are important, there is another criterion for teaching which is probably the most difficult to evaluate: familiarity with professional dispositions expected of educators as delineated in professional, state and institutional standards. This is evaluated through personal interviews with the candidates throughout the progress toward the degree. Candidates who fail to meet this requirement may be subject to dismissal from the School of Education.

Academic Average

The candidate's general average, as well as his or her status in the field of concentration and in education courses is considered. The special academic standards required vary somewhat for different fields. A declared major, a GPA of 2.5 (Childhood and Bilingual) and 2.7 (Secondary) and the recommendation of a faculty advisor are required for admission into student teaching. Candidates who fail to meet this requirement may be subject to dismissal from the School of Education.

Advisory Interview

When the candidate is accepted for admission to the School of Education, an appointment with an advisor is made to assure that the candidate's program is properly planned. Candidates are required to see an advisor at least once every semester for continuous academic advisement. Advisory appointments are scheduled in the Office of Admissions and Student Services, NA 3/223A.

Clinical Experiences

Candidates for secondary education, childhood education or bilingual childhood education certification are required to take one semester of student teaching. The Application for Student Teaching must be filed in the Office of Clinical Practice during the first ten weeks of the candidate's lower senior term. Since the New York City Department of Education needs information in advance for the placement of student teachers, late applications cannot be considered. Deadline dates should be verified in the Office of Clinical Practice, Fieldwork & Student Teaching, NA 6/207A, each semester or online at https://www.ccny.cuny.edu/education/clinical_practice. The New York City Department of Education requires fingerprinting for fieldwork and student teaching placements.

Admission Requirements for Student Teaching

To be admitted to student teaching, candidates must have:

1. A completed application submitted to the Office of Clinical Practice, Fieldwork & Student Teaching
2. A recommendation from their program advisor,
3. Completed a successful interview with the Director of Clinical Practice, Fieldwork & Student Teaching (for programs that require such an interview),
4. Completed all liberal arts requirements, CLAS major and requisite education courses, with grades of "C" or higher,
5. Maintained the required GPA of 2.5 or higher for childhood education and bilingual childhood education and 2.7 or higher for secondary education,
6. Shown satisfactory results from the tuberculin (TB) test,
7. Completed 100 hours of field experiences,
8. Submitted and passed one NYSTCE test (Education All Students [EAS] or Content Specialty Test [CST]).
9. Declared a major or secondary education concentration.

Candidates who are admitted into student teaching but do not successfully complete the experience must reapply and successfully complete all admissions procedures.

Appeals may be made to the Committee on Course and Standing.

Academic/Professional Standards and Regulations

Each undergraduate program establishes the academic and professional standards expected of its candidates. Traditional professional standards conform to but are not limited to the codes of ethics of professional educational associations.

The right is reserved to ask for the withdrawal of any candidate who fails to meet professional standards and/or fails to maintain a satisfactory academic and professional record in courses.

Jurisdiction over Academic and Professional Standards

Department chairs have jurisdiction over offenses regarding academic and professional standards for any candidate whose major field of interest is in their department.

Appeals Procedures of Academic Judgments

The School of Education Committee on Course and Standing will only review appeals that pertain to the School of Education. Appeals relating to the college core must be submitted to the CLAS Committee on Course and Standing.

Candidates who wish to appeal academic judgments, including grades, begin by discussing the grades with the instructor as soon as possible after the grade is issued. Temporary grades in courses may not be changed after the first month of the following semester without approval of the department chair and the dean and no grade may be changed after a candidate has graduated.

If after discussing the grade or other academic judgment with the instructor, a candidate wishes to pursue an appeal, he or she must discuss it with the program director. The program director will make an independent recommendation and then forward it to the chair.

The candidate may pursue the appeal further to the Committee on Course and Standing, which has final jurisdiction. Such appeals are transmitted to the committee through the Office of Admissions and Student Services and, in general, candidates should discuss the appeal with the Assistant Dean of Enrollment and Student Services before submitting a formal appeal.

The Committee on Course and Standing considers appeals in writing and neither the candidate nor the instructor appears in person. The candidate's appeal should be in the form of a detailed letter, accompanied by any supporting evidence the candidate wishes to submit, including copies of the papers or letters from other candidates or instructors. Appeal forms are available online and in the Office of Admissions and Student Services.

The Committee normally asks the instructor, the program director, and the department chair to comment in writing on the candidate's appeal. On request, the Assistant Dean will discuss these responses with the candidate before the Committee meets. The Committee's decision is sent to the candidate in writing by the Assistant Dean. Other academic appeals, such as appeals from probation, academic dismissal and failures for poor attendance may be appealed directly to the Committee on Course and Standing. In addition, requests for waivers of degree requirements, extensions for incompletes, limitations on registration, and similar matters should be made to the committee.

Licensing and Certification Requirements

For each field, an attempt is made in these paragraphs to summarize the requirements of New York State for certification. This is offered as a service only, for general information, and should not be construed as official; nor is it guaranteed to be the latest word, although it is abstracted from recent announcements. Each student is urged to obtain a copy of the requirements from the New York City Public Schools Office of Recruitment, Professional Advisement, and Licensing (ORPAL), 65 Court Street, Brooklyn, New York 11201, <http://schools.nyc.gov> and from the Office of Teaching Initiatives, New York State Education Department, 89 Washington Avenue, Albany New York 12234, www.highered.nysed.gov/tcert.

Certification Requirements of New York State

All those who complete one of the approved Education sequences may qualify for initial certification upon the award of the baccalaureate degree. However, the dean of the School of Education reserves the right to recommend for New York State certification only those candidates who have satisfied all additional requirements that are regarded by City College as important qualifications for teaching. Candidates completing degrees in Childhood Education and Bilingual Childhood Education must receive a minimum of a B grade in student teaching to be recommended to New York State for certification as a classroom teacher. In addition to the academic requirements of the education program, candidates must also pass the New York State Certification Examinations (NYSTCE)

appropriate to the certificate they seek. The requirements for classroom teachers include a teacher performance assessment (edTPA), the Educating All Students (EAS) test, and the Content Specialty Test(s) (CST). In addition, Bilingual Childhood Education candidates must also take the Bilingual Education Assessment (BEA). Information about exam requirements can be found on the TEACH website, <http://www.highered.nysed.gov/tcert/certificate/certexam.html>.

The State Department of Education requires all degree candidates seeking initial New York State certification to file an application for certification electronically, using the TEACH Online Services application system at <http://www.highered.nysed.gov/tcert/>. Instructions for using the system are available from the CCNY certification website at <https://www.ccnycunycuny.edu/education/state-certification>. Candidates must apply for graduation in their last semester in order to receive a recommendation from the CCNY certification office. The recommendation will be submitted upon degree conferral.

Initial Certificates

1. Indicate that the holder has satisfied the requirements for initial certification in the grade level/subject area identified;
2. Indicate to a prospective school employer that the holder is eligible for employment in the specified grade level/subject area identified;
3. Are valid for five years only, and may be extended once.

Bilingual Extension Certificates

Those who teach children in a language other than English, bilingual teachers, must be certified in the area in which they are teaching (i.e., elementary education, special education, or a secondary subject area). They must also have a Bilingual Extension Certificate, which enables them to teach the area to a bilingual student population. The undergraduate Bilingual Childhood Education program at City College prepares students for both the initial teaching certificate and for the bilingual extension of that certificate. To qualify for New York State certification as a bilingual teacher, students must pass the required New York State examinations for the base certificate. They must also pass the Bilingual Education Assessment (BEA).

Teaching Out of New York State

Candidates who have completed an undergraduate teacher education program at City College meet the educational requirements for certification in over 40 states through the Interstate Agreement on Qualification of Educational Personnel. Included among these are Connecticut, Delaware, Florida, Georgia, Maine, Massachusetts, New Hampshire, New Jersey, North Carolina, Rhode Island, South Carolina, Vermont and Virginia. More information on teaching in other states is available through the SOE Certification Officer, NA 3/213.

Student Life and Services

Career Opportunities

The Office of Clinical Practice, Field Experiences, and Student Teaching regularly send emails with information about positions in local and out-of-town school systems.

Student Advisory Committee

This committee provides the opportunity for candidates to participate in standing committees of the School of Education. Its expanded aims include the conscientious desire to represent the point of view of education candidates on curriculum, policy, development and other matters of candidates interest. Candidates who wish to serve on the committee should contact the Office of the Chairs (NA 6/207B).

Advisory Services

Members of the faculty assist candidates in choosing an appropriate curriculum and planning a program of study. They also conduct evaluation interviews for admission to the School of Education and to advanced education courses. Advisors are available throughout the year, except for intersession, the first three weeks, and the final examination weeks of each term. During registration, only immediate problems can be considered, since individual advisors may not be present. During the Summer session, limited advisory service is

available. Advisory appointments are scheduled in the Office of Admissions and Student Services (NA 3/223A).

Education Club (Teachers of Tomorrow)

Teachers of Tomorrow offers candidates interested in teaching careers an opportunity to explore issues of common interest; to promote professional growth; to act as a service group to the School of Education, The City College, and the community; and to maintain dialogue with the faculty in matters relevant to teaching. Candidates who wish to join the club or serve as officers should contact the Director of the Learning and Technology Resource Center (NA 3/226).

Department of Teaching, Learning, and Culture

Professor Amita Gupta, Chair • Department Office: NA 6/207B • Tel: 212-650-7262

General Information

The City College offers the following undergraduate degrees in Childhood Education:

- Bilingual Childhood Education (B.S. Ed.)** (p. 242)
- Childhood Education (B.S. Ed.)** (p. 242)
- Early Childhood Education (B.S.)** (p. 243) (see Department of Interdisciplinary Arts and Sciences (p. 196))

General Information

The City College offers the following undergraduate degrees in Childhood Education:

- Bilingual Childhood Education (B.S. Ed.)** (p. 242)
- Childhood Education (B.S. Ed.)** (p. 242)
- Early Childhood Education (B.S.)** (p. 243) (see Department of Interdisciplinary Arts and Sciences (p. 196))

Bilingual Childhood Education, Bachelor of Secondary Education (B.S. Ed.)

Requirements for Majors

Required Education Courses:

EDCE 20000	Inquiry in Education	3
EDCE 20600	Observing Children and Their Development	3
EDCE 22200	The School in American Society: Bilingual Education in the Urban School	3
EDCE 25600	Language, Mind, and Society	3
EDCE 32200	How Children Learn Mathematics: Implications for Teaching	3
EDCE 32300	Emergent to Fluent Literacy	3
EDCE 32310	Inclusive Practices for the General Education Classroom (Grades 1 - 6)	3
EDCE 35301-35303	Teaching Language Arts and Reading in a Bilingual Program (Spanish/Haitian/Chinese)	3
EDCE 35600	Language, Mind and Society	3
EDCE 41600	Seminar in Bilingual Childhood Education	2
EDUC 41900	Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics	0
EDCE 42000	Science in a Program of Childhood Education	3
EDCE 42100	Integrating the Curriculum through the Social Studies	3

EDCE 45500	Classroom Based Inquiry in Bilingual Education	3
EDCE 45600	Teaching Content (Math, Science, and Social Studies) Using Both English and a Native Language	3
EDCE 45800	Student Teaching in Bilingual Childhood Education	4

Subtotal: 42

Required Liberal Arts Courses

WCIV 10200	1500 A.D. to the Present	3
WHUM 10200	World Humanities II	3
MATH 18500	Basic Ideas in Mathematics	3
SPAN 37300	Advanced Spanish Composition & Conversation	3
SPAN 37400	Lit For Young Adults	3
ANTH 26500	Language and Society	3
ANTH 27500	Creole Sociolinguistics	3
ART 15500	Introduction to Art Education	3
MUS 15200	Fundamentals of Music for Elementary School Teachers	2
	Liberal Arts Elective (1-2) cr.	

Childhood Education, Bachelor of Secondary Education (B.S. Ed.)

Requirements for Majors

Required Courses:

EDCE 20000	Inquiry in Education	3
EDCE 20600	Observing Children and Their Development	3
EDUC 22100	Urban Schools in a Diverse American Society	3
EDCE 32200	How Children Learn Mathematics: Implications for Teaching	3
EDCE 32300	Emergent to Fluent Literacy	3
EDCE 32310	Inclusive Practices for the General Education Classroom (Grades 1 - 6)	3
EDCE 41500	Seminar in Childhood Education	3
EDCE 41800	Student Teaching in Childhood Education	4
EDUC 41900	Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics	0
EDCE 42000	Science in a Program of Childhood Education	3
EDCE 42100	Integrating the Curriculum through the Social Studies	3
EDCE 42300	Literacy: Fluent to Experienced	3

Subtotal: 34

Required Liberal Arts Courses

WCIV 10200	1500 A.D. to the Present	3
WHUM 10200	World Humanities II	3
MATH 18500	Basic Ideas in Mathematics	3
SPAN 12300	Introductory Spanish I	3
	OR	

SPAN 12400	Introductory Spanish II OR Exemption	3
SCI 12600	Principles of Environmental Science	3
ART 15500	Introduction to Art Education OR	3
MUS 15200	Fundamentals of Music for Elementary School Teachers	2

*Science under Advisement***Early Childhood Education, Bachelor of Science (B.S.)**

See listing for the Department of Interdisciplinary Arts and Sciences (p. 197).

Childhood and Biligual Childhood Education Co-majors

Requirements for Childhood and Bilingual Childhood Education include an approved co-major or one of the following interdisciplinary co-majors:

For course descriptions and prerequisites, please see the relevant department pages.

Arts and Its Cultural Context Interdisciplinary Co-Major (30 credits)**Select one of the following:**

ART 10100	2-Dimensional Design	3
ART 10200	Introduction to Drawing	3

Select one of the following:

ART 10900	3-Dimensional Design	3
ART 10600	Introduction to Sculpture	3
ART 10700	Introduction to Ceramic Design	3

Required course:

ART 21000	Writing about Art	3
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Select one of the following:

ART 21062	History of Art I: Ancient through Medieval	3
ART 21064	History of Art II: Renaissance through Modern	3

Select three courses within such areas as:

Anthropology, Art History, Asian Studies, Black Studies, History, Jewish Studies, and Latin American Studies.

At least one of these courses must be at the 300 level or above (9 cr.):

ANTH 20100	Cross-Cultural Perspectives	3
ANTH 22804	Urban Anthropology	4
ANTH 32300	Islamic Cultures and Issues	3
ART 21013		
ART 21014	Greek and Roman Art	3
ART 21022	Romanesque and Gothic Art	3
ART 21026	Baroque and Rococo Art in Europe	3
ART 21030	Nineteenth Century Art in Europe	3
ART 21032	American Art 1776-1900	3
ART 21038	Postwar Art in the U.S. and Europe	3
ART 21052	Islamic Art	3
ART 21054	Art of China, Japan, and Korea	3
ART 21062	History of Art I: Ancient through Medieval	3
ART 21064	History of Art II: Renaissance through Modern	3
ASIA 20200	Contemporary Asia	3
ASIA 31611	Contemporary Japan	3

ASIA 31612	Contemporary Korea	3
BLST 31110	Black Masculinities	3
BLST 31608	Af-Latinos-Hist-Cul	3
BLST 31713	Blk Art In Aids Age	3
BLST 33125	Womn Africn Diasopra	3
HIST 32300	The New Nation, Slave and Free	3
HIST 34104		
HIST 48200	Women and Gender Relations in Latin America	3
JWST 34200	Jews Of Latin Amer	3
JWST 44500	Jews of Morocco	3
LALS 31100	Decon Dominican Iden	3
LALS 31102	Carib Magic & Spirit	3

Select three of the following advanced study courses (9 cr):

ART 31012	Arts of Africa: An Introduction	3
ART 31038	Art Since 1980	3
ART 31531	Modern Mexican Art	3
ART 31110	Asian Art Since 1900	3
ART 31114	Topics In Folk Art	3
ART 31115	Public Art in the U.S.	3
ART 31501-31510	Selected Topics in Studio Art	3
ART 32000	Figure Drawing	3
ART 35000	Watercolor	3
ART 36600	Furniture Design	3
PHIL 32500	Aesthetics: The Philosophy of Art	3
PHIL 34500	American Philosophy	3
PHIL 34600	Feminist Philosophy	3

Biology Interdisciplinary Co-Major (46 credits)**Required Courses**

CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 26100	Organic Chemistry I	3
MATH 19500	Precalculus	3
MATH 20500	Elements of Calculus	4
MATH 20900	Elements of Calculus and Statistics	4
BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
BIO 20600	Introduction to Genetics	4
BIO 20700	Organismic Biology	4
BIO 22800	Ecology and Evolution	4
BIO 22900	Cell and Molecular Biology	4

Earth Science Interdisciplinary Co-Major (47 credits)**Required Courses**

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
MATH 19500	Precalculus	3
EAS 10100	The Atmosphere	3
EAS 10600/10601		
EAS 21700	Systems Analysis of the Earth	4
EAS 22700	Structural Geology	4
EAS 30800	ESS Modeling/Databases	3
EAS 31300	Envir. Geochemistry	3
EAS 32800	Global Environmental Hazards	3

Language and Literature Interdisciplinary Co-Major (30 credits)**Required Courses**

ENGL 25000	Introduction to Literary Study	3
ENGL 22000	Introductory Workshop in Creative	3

ENGL 21001	Writing Writing for Humanities and the Arts	3	HIST 37000	Emancipation to the Present	3
ENGL 34200	Advanced Grammar	3	ANTH 33000	American Legal History	3
ENGL 23000	Writing Workshop in Prose	3	ART 28000	Contemporary Culture Theory	3
ENGL 32400	Reading and Writing Children's Literature	3	ECO 10000	Projects in Wood Design	3
ANTH 20200	Languages and Dialects in Cross-Cultural Perspective	3	PSC 20800	American Political Thought	3
			PSC 20900	Amer Pol Thought 2	3
			PSC 22100	The Congress	3
			PSC 22200	The Presidency	3
			SOC 25300	Ethnic Minority Groups	3
Approved Substitutes:			Social Science Theory and Practice:		
ANTH 27300	Black English: Structure and Use	3	ANTH 20200	Languages and Dialects in Cross-Cultural Perspective	3
ANTH 26500	Language and Society	3	ANTH 22500	Class, Ethnicity and Gender	3
ANTH 27500	Creole Sociolinguistics	3	ANTH 33300		
EDCE 35600	Language, Mind and Society	3	HIST 37500	U.S. South	3
ENGL 37001	African American Literature in America	3	PSC 27300	Political Systems of Asia	3
ENGL 37004	African American Fiction	3	PSC 27400	Modern Political Thought: Up to 1848	3
Mathematics Interdisciplinary Co-Major (30 credits)			PSC 27500	Contemporary Political Thought: 1848 to the Present	3
Required Courses			PSY 24700	Social Psychology	3
BIO 10100	Biological Foundations I	4	PSY 25300	Cognitive Psychology: Thinking, Knowing and Remembering	3
BIO 10200	Biological Foundations II	4	SOC 23800	Contemporary Sociological Theory	3
CHEM 10301	General Chemistry I	4	SOC 26000	Theory of Social Change	3
CHEM 10401	General Chemistry II	4	SOC 26500	Sociology of Childhood	3
EAS 10600/10601			World Studies:		
Select one of the following two options:			INTL 20100	International Studies: A Global Perspective	3
Option 1:			HIST 25300	Modern China	3
MATH 19500	Precalculus	3	HIST 25500	Modern Japan	3
MATH 20100	Calculus I	3	HIST 28200	Modern and Contemporary Latin America	3
MATH 20200	Calculus II	3	HIST 34100		
MATH 20300	Calculus III	4	HIST 37100		
MATH 30800	Bridge to Advanced Mathematics	3	PSC 22300	United States Foreign Policy	3
MATH 17300	Introduction to Probability and Statistics	4	PSC 23600	Political Systems of Latin America	3
	OR		PSC 23800	Political Systems of Africa	3
MATH 34500	Theory of Numbers	3	PSC 24500	Caribbean Politics	3
Option 2:			PSC 25200	Theories of International Relations	3
MATH 19500	Precalculus	3	SOC 29000	Immigration	3
MATH 20500	Elements of Calculus	4	Theatre and Its Cultural Context Interdisciplinary Co-Major (30 credits)		
MATH 20900	Elements of Calculus and Statistics	4	Choose one of the following:		
MATH 30800	Bridge to Advanced Mathematics	3	THTR 13100	Introduction to Theatre Arts	3
And one of the following:			MCA 12100	Introduction to Film Studies	3
MATH 17300	Introduction to Probability and Statistics	4	Choose one of the following: 1		
MATH 34500	Theory of Numbers	3	THTR 13600	Beginning Acting	3
MATH 36000	Introduction to Modern Geometry	3	THTR 13400	Basic Production and Design	3
MATH 36500	Elements of Combinatorics	4	THTR 13200	Body Movement	3
Social Studies Interdisciplinary Co-Major (30 credits)			Choose one of the following: 2		
Required Courses:			THTR 21100	Theatre History I	3
ANTH 20100	Cross-Cultural Perspectives	3	THTR 21200	Theatre History II	3
SOC 23200	Methods and Techniques of Sociological Research	4	THTR 21300	Theatre History III	3
PSY 10300			Choose one of the following: 3		
Select a concentration in either American Institutions, Social Science Theory and Practice, or World Studies.			ANTH 20100	Cross-Cultural Perspectives	3
American Institutions:			ANTH 26500	Language and Society	3
HIST 36200			PHIL 32400	Philosophy of Language	3
HIST 36500	African-American History from	3	PHIL 32500	Aesthetics: The Philosophy of Art	3

PHIL 34000	Self and Identity	3
Select 4 courses (12 cr.) in Cultural Studies from the following:		
ANTH 32300	Islamic Cultures and Issues	3
ASIA 20200	Contemporary Asia	3
ART 21054	Art of China, Japan, and Korea	3
BLST 32300	Islam In The Afr Amer Expernce	3
BLST 33000	Afro-American Heritage: 1619 to 1865	3
BLST 33300	The Black Woman	3
ENGL 35301	Shakespeare I	3
ENGL 35302	Shakespeare II	3
ENGL 37001	African American Literature in America	3
JWST 31107	Recent Israeli Film	3
LALS 31301	Puerto Rica & Dominic	3
SPAN 28300	Masterworks of Latin American Literature	3

Select 2 courses (6 cr.) in Advanced Study in Theatre from the following:

THTR 23200	Black Theatre, U.S.A. I	3
THTR 23300	Directing I	3
THTR 23701-23703	Technical Theatre Practicum	1-3
THTR 23800	Musical Theatre Workshop	3
THTR 31125	Children'S Theatre	3
THTR 33100	Playwriting	3
THTR 43000	Theatre Workshop	3
THTR 45004	Theatre On Film	3
THTR 44405	Dramaturgy	3
THTR 45010	Non-Western Drama	3

Advisement

The Office of Admissions and Student Services (NA 3/223A; 212-650-5316) or the Office of the Chair (NA 6/207B; 212-650-7262) will assist you in contacting the faculty member in charge of any of the programs above.

Faculty

Megan Blumenreich, Associate Professor
B.A., Colby College; M.A., Teachers College, Columbia Univ., Ed.M., Ed.D.

Nancy Cardwell, Assistant Professor
B.A., St. John's University; M.S., Bank Street College of Education; Ed.M., Harvard University, Graduate School of Education; Ph.D., The Graduate Center, City University of New York

David Crismond, Associate Professor
B.A., Rutgers College; M.S. Ed., Harvard Graduate School of Education, Ed. D.

Joseph Davis, Associate Professor
B.S. Wake Forest Univ.; M.S.P.H., Univ. of North Carolina; M.A., M.Phil., Columbia Univ., Ph.D.

Beverly Falk, Professor
B.A., Sarah Lawrence College; M.S.Ed, CCNY; Ed.D., Teachers College, Columbia Univ.

Jesús Fraga, Lecturer
B.S., The City College, CUNY; M.S., Bank Street College of Education; M.A., Adelphi University

Laura Gellert, Associate Professor
A.B., Bryn Mawr College; M.S., New York Univ. ;Ph.D The Graduate Center, CUNY

Catherine Franklin, Associate Professor

B.A., Univ. of Rhode Island; M.A., Lesley College Graduate School; Ed. D., Teachers College, Columbia Univ.

Amita Gupta, Professor and Chair
B.Ed., Univ. of Delhi, B.Sc.; M.A., Columbia Univ.; Ed.D., Teachers College, Columbia Univ.

Gretchen Johnson, Associate Professor and Interim Dean
B.A., Queens College.; M.A., Yeshiva Univ.; Ph.D., New York Univ.

Tatyana Kleyn, Associate Professor
B.S., Ohio State Univ., M.E.; Ed.D., Teachers College, Columbia Univ.

Dina López, Assistant Professor
B.A., Brown University; M.S., Fordham University; Ed.D., Teachers College, Columbia Univ.

Nadjwa Norton, Associate Professor
B.A., Yale Univ.; M.Ed., Teachers College, Columbia Univ., Ed.D.

Nancy Stern, Associate Professor
B.A., The College of William and Mary; M.Phil. (Linguistics), CUNY, Ph.D.

Jan Valle, Associate Professor
B.A., Furman University, M.A.; Ed.D., Teachers College, Columbia Univ.

Anne Wilgus, Associate Professor
B.L.A., Sarah Lawrence College; M.F.A., Univ. of North Carolina-Greensboro; M.S.Ed., Bank Street College; Ph.D., CUNY

Professor Emeritus

Ruth R. Adams

Hubert Dyasi

Shirley Feldmann

Catherine Twomey Fosnot

Adele MacGowan-Gilhooly

Ruth Grossman

Elisabeth S. Hirsch

James L. Neujahr

Oliver Patterson

Madelon Delany Stent

Department of Secondary Education

Associate Professor Hazel Carter, Acting Chair • Department Office: NA 6/207B • Tel: 212-650-7262

General Information

The City College offers the following undergraduate concentrations in Secondary Education:

Art Education; English Education; Mathematics Education; Music Education; Science Education: Biology, Chemistry, Earth Science, and Physics; Social Studies Education; and Spanish Education

Advisement

The School of Education Office of Admissions and Student Services (NA 3/223A; 212-650-5316) or the Office of the Chair (NA 6/207B; 212-650-7262) will assist you in contacting the faculty member in charge of any of the programs above.

Requirements for Secondary Education Concentrations

Preparation for teaching in secondary schools requires a CLAS major in a field taught in the secondary schools (i.e. science, mathematics) and completing the education concentration sequence below.

Education Courses for Teaching Art P-12 (B.A.)

See Art, Bachelor of Arts (B.A.) Teaching Art P-12 Concentration (p. 159)

Required Courses

EDSE 20500	Intro Computng Tech OR	3
EDUC 20600	Obsrv Chldrn & Devl	3
EDUC 22100	Urban Schools in a Diverse American Society	3
SPED 32000	Introduction to Inclusive Education	3
EDSE 32500	Special Issues for Secondary School Teachers: Literacy and ESL	2
EDSE 41200	Teaching Reading and Writing in Secondary School Subjects OR	3
EDCE 32300	Emergent to Fluent Literacy	3
EDSE 32300	Curriculum Development in Art	4
EDSE 44400	Methods of Teaching Art	4
EDSE 46400	Student Teaching in Arts Education (P-12)	4
EDSE 46301	Seminar on Student Teaching in Secondary Schools	2
EDUC 41900	Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics	0

Subtotal: 28

Education Courses for Teaching English (B.A.)

See English, Bachelor of Arts (B.A.) Secondary English Education Concentration (p. 188)

Required Courses

EDSE 20500	Intro Computng Tech	3
SPED 32000	Introduction to Inclusive Education	3
EDSE 32500	Special Issues for Secondary School Teachers: Literacy and ESL	2
EDSE 41400	Teaching Reading and Writing in the ELA Classroom	3
EDSE 44100	Methods of Teaching English in Secondary Schools	4
EDSE 45101	Development of the Secondary School: Philosophy, Urban Issues and Curriculum Development in Secondary School English	4
EDSE 46300	Student Teaching in Middle and Secondary Education	4
EDSE 46301	Seminar on Student Teaching in Secondary Schools	2
EDUC 41900	Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics	0

Subtotal: 25

Education Courses for Teaching Mathematics (B.A.)

See Mathematics, Bachelor of Arts or Science (B.A. or B.S.) Secondary School Education (p. 202)

Required Courses

EDUC 20500	Adolescent Learning and Development	3
SPED 32000	Introduction to Inclusive Education	3
EDSE 32500	Special Issues for Secondary School Teachers: Literacy and ESL	2
EDSE 41200	Teaching Reading and Writing in Secondary School Subjects	3
EDSE 44600	Methods of Teaching Secondary School Mathematics	4
EDSE 45104	Development of the Secondary School: Philosophy, Urban Issues and Curriculum Development in Secondary School Mathematics	4
EDSE 46300	Student Teaching in Middle and Secondary Education	4
EDSE 46301	Seminar on Student Teaching in Secondary Schools	2
EDUC 41900	Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics	0

Subtotal: 25

Education Courses for Teaching Music K-12 (B.A.)**Required Courses**

EDUC 20500	Adolescent Learning and Development	3
EDCE 22100	School, Family, Community	2
SPED 32000	Introduction to Inclusive Education	3
EDSE 32500	Special Issues for Secondary School Teachers: Literacy and ESL	2
EDSE 41200	Teaching Reading and Writing in Secondary School Subjects	3
EDSE 44700	Methods of Teaching Music	3
EDSE 46300	Student Teaching in Middle and Secondary Education	4
EDSE 46301	Seminar on Student Teaching in Secondary Schools	2
EDUC 41900	Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics	0

Subtotal: 24

Education Courses for Teaching Science: Biology, Chemistry, Earth Science, Physics (B.S.)

See Chemistry, Bachelor of Science (B.S.) Secondary Education Concentration (p. 171)

See Physics, Bachelor of Science (B.S.) Secondary Education Concentration (p. 215)

Required Courses

SPED 32000	Introduction to Inclusive Education	3
EDSE 32500	Special Issues for Secondary School Teachers: Literacy and ESL	2
EDSE 44300	Methods of Teaching Secondary School Science	4
EDSE 44301	Adolescent Learning of Science Education	1
EDSE 45103	Development of the Secondary	4

	School: Philosophy, Urban Issues and Curriculum Development in Secondary School Science	
EDSE 46300	Student Teaching in Middle and Secondary Education	4
EDSE 46301	Seminar on Student Teaching in Secondary Schools	2
EDUC 41900	Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics	0
Subtotal: 20		

Education Courses for Teaching Social Studies (B.A.)

See History, Bachelor of Arts (B.A.) Teaching Social Science in Secondary Schools (p. 193)

Required Courses

EDSE 20500	Intro Computng Tech	3
SPED 32000	Introduction to Inclusive Education	3
EDSE 32500	Special Issues for Secondary School Teachers: Literacy and ESL	2
EDSE 41200	Teaching Reading and Writing in Secondary School Subjects	3
EDSE 44200	Methods of Teaching Secondary School Social Studies	4
EDSE 45102	Development of the Secondary School: Philosophy, Urban Issues and Curriculum Development in Secondary School Social Studies	4
EDSE 46300	Student Teaching in Middle and Secondary Education	4
EDSE 46301	Seminar on Student Teaching in Secondary Schools	2
EDSE 41900		
Subtotal: 25		

Education Courses for Teaching Spanish (B.A.)

See Romance Languages, Bachelor of Arts (B.A.) Teaching Spanish in Secondary Schools (p. 177)

Required Courses

EDUC 20500	Adolescent Learning and Development	3
EDCE 22200	The School in American Society: Bilingual Education in the Urban School	3
SPED 32000	Introduction to Inclusive Education	3
EDSE 41300	Methods of Teaching Writing and Reading in Spanish in Secondary Schools	3
EDSE 44500	Methods of Teaching in Secondary Schools: Spanish	4
EDSE 45105	Curriculum Development in Secondary School Spanish	4
EDSE 46300	Student Teaching in Middle and Secondary Education	4
EDSE 46301	Seminar on Student Teaching in Secondary Schools	2
EDUC 41900	Workshops on Child Abuse Identification, School Violence Prevention, Dignity for All Students Act (DASA) and other professional topics	0

Subtotal: 26

Faculty

Shira Eve Epstein, Associate Professor
B.A., Rutgers Univ.; M.A., Teachers College, Columbia Univ., Ed.D.

Edwin M. Lamboy, Associate Professor and Chair
B.A., Universidad de Puerto Rico (Río Piedras); M.Ed., Lehman College; Ph.D., The Pennsylvania State Univ.

Andrew Ratner, Assistant Professor
B.A., Brown Univ.; M.A., Teachers College, Columbia Univ., Ed.D.

Elizabeth Rorschach, Associate Professor
B.A., Carleton College; M.A., Columbia Univ.; Ph.D., New York Univ.

Richard N. Steinberg, Professor
B.S., SUNY (Binghamton); M.S., Yale Univ., Ph.D.

Despina A. Stylianou, Professor
B.S., Boston Univ., M.Ed.; M.A. (Mathematics), Univ. of Pittsburgh, Ed.D.

Yael Wyner, Associate Professor
B.S., Yale Univ.; Ph.D. New York Univ./American Museum of Natural History

Sunita Vatak, Assistant Professor
B.A., University of California at Berkeley; Ph.D., Princeton University

Affiliate Faculty

Marit Dewhurst, Assistant Professor
B.A., Univ. of Michigan; Ed.M., Harvard University, Ed.D.

Issa Salame, Assistant Professor and Master Teaching Fellow
B.S., The City College; M.Ph., Ph.D., The Graduate Center of the City University of New York

Professors Emeriti

Bernard Bernstein

Augustine Brezina

Robert Lento

Joel Mansbach

Martin Marin

Harold J. McKenna

Anne S. Peskin

Alfred S. Posamentier

Howard Sasson

The Grove School of Engineering

Professor Gilda Barabino, Dean • Office: ST 142 • Tel: 212-650-5435

Professor Ardie D. Walsler, Associate Dean, Academic Affairs for Undergraduate and Graduate Studies • ST-152, 212-650-8030

Rawlins Beharry, Assistant Dean for Undergraduate Studies and Student Affairs • ST-2M7, 212-650-8040

The Profession of Engineering and Computer Science

Engineering, including Computer Science, is often described as “design under constraint.” Engineers and computer scientists design objects, from simple components to devices, to complex systems and structures that eventually bring about an improvement in our quality of life. Successful designs must, however, comply with many, sometimes conflicting, demands of a technical, political, social, economic, and ethical nature.

Student contemplating an engineering or computer science career will need a solid background in mathematics and the physical sciences. As engineering subdisciplines proliferate, however, and interdisciplinary approaches become more common, the modern engineer may also need grounding in other scientific fields, especially the biological sciences.

The Grove School of Engineering at City College provides a broad-based general education as well as professional training. It also prepares students for life-long learning. As scientific and engineering knowledge roughly doubles every 10 years, today’s engineering student can no longer expect to learn all that he or she will ever need to know simply by completing a bachelor’s degree program. Each of the eight degree programs offered by the Grove School of Engineering emphasizes in its curriculum the acquisition of learning skills necessary for the future engineer to continue learning throughout his or her professional career.

Engineering and Computer Science Ethics

In order to maintain high standards of conduct and uphold and advance the dignity of the engineering and computer science profession, engineers and computer science profession, engineers, computer scientists are committed to the following: exercising integrity and impartiality in the service of employers, clients, and the public; striving to increase competence in engineering and computer science while enhancing the prestige of the profession; and using knowledge and skill for the betterment of human welfare. Statements of standards for relations with the public, clients, and employers are available from technical societies and from the Accreditation Board for Engineering and Technology (ABET). The Grove School of Engineering is also affiliated with the Order of the Engineer, a nationwide organization open to engineering seniors, who accept an obligation to maintain high ethical standards in their professional and personal behavior.

History

The City College Grove School of Engineering is the sole entity for engineering education within The City University of New York. Its origins date from 1916, when the Board of Trustees authorized a curriculum leading to the Diploma of Junior Civil Engineer. In 1917, more extensive courses in chemical, civil, electrical, and mechanical engineering were established within the natural science curriculum of the College of Liberal Arts and Science. In 1919, the School of Technology was established with four engineering programs leading to the degrees of Chemical Engineer, Civil Engineer, Electrical Engineer, and Mechanical Engineer, as well as the degree of Bachelor of Science in Engineering. After 1936, the latter degree was replaced by the degrees

of Bachelor of Chemical Engineering, Bachelor of Civil Engineering, Bachelor of Electrical Engineering, and Bachelor of Mechanical Engineering.

Effective September 1962, the Board of Higher Education approved a change in the name of the School of Technology to the School of Engineering and Architecture.

In December 1962, the Regents of the University of the State of New York reduced the number of degree designations authorized for engineering programs. The new degree designations for the School became Bachelor of Engineering and Master of Engineering. Authority was given to the College to indicate the branch of engineering in parentheses after the degree title, e.g. Bachelor of Engineering (Chemical Engineering), Master of Engineering (Civil Engineering). These designations have been in effect since September 1, 1963.

Effective July 1968, the Board of Higher Education approved the separation of the School of Engineering and the School of Architecture. The latter is now called the School of Architecture, Urban Design and Landscape Architecture.

Since September 1963, under the authority of The City University of New York (CUNY), the School of Engineering has offered advanced study leading to the degree of Doctor of Philosophy. The doctoral program is available to students from the Biomedical, Chemical, Civil, Electrical and Mechanical Engineering degree programs. In August 2008, The City College was granted the authority by the State of New York to offer Ph.D. degrees in Engineering.

Beginning September 1968, The City College has offered a four-year curriculum leading to a Bachelor of Science degree in Computer Science. Since September 1969, a Master of Science degree in Computer Science has also been offered. The Doctor of Philosophy degree in Computer Science is also available.

Since September 1999, the Doctor of Philosophy degree in Biomedical Engineering has been offered. Since September 2000 the degree of Master of Science (Biomedical Engineering) and the degree of Bachelor of Engineering (Computer Engineering) are available. Since September 2002 the degree of Bachelor of Engineering (Biomedical Engineering) has been offered.

In 2006, the School of Engineering was renamed The Grove School of Engineering in recognition of the generous support of its renowned alumnus, Dr. Andrew S. Grove ‘60.

Mission

The mission of the Grove School of Engineering is:

- I. To be a school of national preeminence among public schools of engineering and computer science, recognized for the excellence of its instructional and research programs;
- II. To provide readily accessible, quality undergraduate and graduate education in a broad range of fields to a highly diverse student body, including traditionally underrepresented minorities and women, working adults, and immigrants;
- III. To maintain and expand the program of fundamental and applied research in areas of national interest, particularly in technologies with relevance to New York City, its metropolitan region and New York State;

- I. To be a school of national preeminence among public schools of engineering and computer science, recognized for the excellence of its instructional and research programs;
- IV. To provide public service and continuing professional education opportunities to New York City and State, the local community in which the institution resides, the engineering and computer science professions, and society at large.

Goal Statement

The goals of the Grove School of Engineering are to:

1. Attract and maintain a world class faculty devoted to the synergistic activities of teaching and research;
2. Increase the competitive position of the school for attracting high achieving students;
3. Educate students to achieve the outcomes set forth by each program;
4. Continuously enhance the quality and technological relevance of graduate education and research programs;
5. Implement appropriate instructional delivery and support systems that facilitate access by a highly diverse student body;
6. Encourage multi-disciplinary approaches to both teaching and research in keeping with current technological progress in today's world;
7. Develop partnerships with industry, government, and other external organizations that will enhance the School's educational and research activities;
8. Attract the external resources necessary to support cutting-edge research;
9. Assist in the preparation of K-14 students for further education in engineering and computer science; and
10. Provide continuing education, technological expertise and public service to the engineering and computer science professions, the local community, and the state and city governments.

Accreditation

All undergraduate curricula leading to the baccalaureate degree in engineering are accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012—telephone: (410) 347-7700. The Computer Science curriculum leading to the baccalaureate degree in science for computer science is accredited by the Computing Accreditation Commission (CAC) of ABET.

The undergraduate curricula leading to the bachelor's degree in engineering and the graduate curricula leading to the master's degree in engineering are registered by the New York State Department of Education as meeting educational requirements for the license of Professional Engineer in the State of New York. The City College is accredited by the New York State Department of Education and by the Middle States Association of Colleges and Secondary Schools.

The Grove School of Engineering is an institutional member of the American Society for Engineering Education. It participates in the Society's Engineering College Administrative Council and in its Engineering College Research Council. The School is also a member of the Association of Engineering Colleges of New York State.

Facilities and Services

David B. Steinman Hall is the primary engineering building. It houses the offices of the Dean, the associate and assistant deans, and the administrative offices and all laboratories, research facilities, computer rooms, and conference rooms of the Departments of Biomedical,

Chemical, Civil, Electrical, and Mechanical Engineering. The administrative offices of the Computer Science Department are located in the North Academic Center (NAC building). The Computer Engineering Program is co-administered by the Departments of Computer Science and Electrical Engineering. Many of the actual classrooms for engineering subjects are found in various other buildings on the campus.

Office of Academic Affairs- Undergraduate Studies

Undergraduate Studies in the Office of Academic Affairs maintains academic standards by interpreting and enforcing the school's rules, regulations and procedures. Other responsibilities of the office include graduation certification; coordinating Bulletin information; initial advising of transfer and second-degree students; and participating in curriculum articulation and joint-dual programs with other institutions.

It advises all incoming GSoE students and helps them navigate the City College campus and Grove's academic curriculum to ensure a successful transition to college life and eventual graduation. To enhance students' college experience, Undergraduate Studies has a vibrant slate of student programming including academic, professional and leadership development initiatives.

It conducts orientation for new undergraduate entrants to the Grove School and facilitates workshops on effective study habits and academic expectations. Counselors work individually with each new undergraduate student, providing guidance and support and they assist Grove's lower-division students with their course selection, registration, and decision making on academic majors, as well as, provide Grove's undergrads with short-term personal counseling and wellness education. It also provides assistance to Grove's undergraduates with resume writing, interviewing strategies, and the opportunity search process.

Undergraduate Studies maintains Grove's study facility, its Tutoring Laboratory/Center and its Learning Resource Library. It manages the academic services in the Grove School including tutoring for the undergraduate population as well as academic counseling.

Other Undergraduate Studies initiatives include overseeing the Engineering Student Council of Presidents & Leaders (co-curricular life), select student diversity affairs, and specialized undergraduate recruitment initiatives. Undergraduate Studies also supports the needs of the Diversity in Engineering Advisory Board (DEAB), which provides guidance on student professional development.

Undergraduate Studies also works with faculty and staff in GSoE to conduct seminars and workshops to introduce research to the student population and provide advice and consultation for student participation in research and other experiential learning, and to help students be better prepared for graduate study. It assists students in identifying faculty mentors, projects, and departmental resources and .

The Office of Graduate Studies also administers all masters and Ph.D. programs in the GSoE. Information on graduate studies is available at the Office of Academic Affairs. Undergraduates who are interested in taking graduate courses must obtain prior approval. Contact Undergraduate Studies (room ST-209; 212-650-8020) for more details.

Office of Student Development (OSD)

The Office of Student Development advises all GSoE students with less than 45 credits, and helps them navigate the City College campus and Grove's academic curriculum to ensure a successful transition to college life and eventual graduation. To enhance students' college experience,

OSD has a vibrant slate of student programming including academic, professional and leadership development initiatives.

OSD conducts orientation for new undergraduate entrants to the Grove School and facilitates workshops on effective study habits and academic expectations. OSD counselors work individually with each new undergraduate student, providing guidance and support. OSD academic advisors assist Grove's lower-division students with their course selection, registration, and decision making on academic majors, as well as, provide Grove's undergrads with short-term personal counseling and wellness education. OSD also provides assistance to Grove's undergraduates with resume writing, interviewing strategies, and the opportunity search process.

OSD maintains Grove's study facility, its Tutoring Laboratory/Center and its Learning Resource Library. OSD manages the academic services in the Grove School including tutoring for the undergraduate population as well as academic counseling and the student educational affairs for Grove's lower division.

Other OSD initiatives include overseeing the Council of Engineering Student Organizations & Leaders (co-curricular life), student diversity affairs, and specialized undergraduate recruitment initiatives. OSD also supports the needs of the Diversity in Engineering Advisory Board (DEAB), which provides guidance on student professional development.

Office of Student Research And Scholarship (OSRS)

This office works with faculty and staff in GSoE to conduct seminars and workshops to introduce research methods and provide advice and consultation for student participation in research, to encourage undergraduate students to pursue career in technical fields, and to help students be better prepared for graduate study. OSRS staff assists students in identifying faculty mentors, projects, and departmental resources: publishes the GSoE Journal of Student Research, in bound form and online at www.gsoejsr.org; and maintains a list of fellowships and scholarships for students and faculty.

Office of Graduate Studies

This office administers all masters and Ph.D. programs in the GSoE. Information on graduate studies is available here. Undergraduates who are interested in taking graduate courses must obtain prior approval. Visit the OUA (room ST-209; 212-650-8020) or the Graduate Studies office (room ST-152; 212-650-8030) for more details.

Undergraduate Admissions

Degree Programs

Currently, programs are offered leading to undergraduate degrees in the following majors:

Bachelor of Engineering

- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Earth System Science and Environmental Engineering
- Electrical Engineering
- Mechanical Engineering

Bachelor of Science

- Computer Science

Freshman Admission Requirements

For information about academic requirements, application procedures, placement examinations, and special admissions programs, consult the Admissions section (p. 144) of this Bulletin.

Because mathematics and physics are of such great importance in engineering, it is recommended that students choose as many courses as possible in these subjects while still in high school. High school students should also concentrate on perfecting their use of English in reading and writing.

Transfer Students

Information about admission requirements, application procedures, placement examinations, and evaluation of transfer credits can be found in the Admissions section (p. 144) of this Bulletin. For other questions, refer to the Office of Admissions, A-101, (212) 650-6977.

Changing majors, from another college or within CCNY, will usually delay graduation because not all prior courses will apply to the new degree.

External Transfers

Transfer students are admitted to the Grove School of Engineering or directed to the College of Liberal Arts and Science on the basis of the math and science courses they have completed, the total number of credits completed, and their college (sometimes high school) GPA. Students who do not meet Grove School of Engineering criteria but who are otherwise eligible for admission to City College may enter the College of Liberal Arts and Science (CLAS).

Students pursuing a degree in Engineering Technology should note that no technical courses in the technology program are transferable to any engineering program. Many engineering courses in associate degree programs do not transfer because they are based on less prerequisite knowledge than GSoE courses with similar titles or descriptions. For more information about articulation with CUNY colleges call (212) 650-8020. All final decisions regarding the transferability of courses remain with the College and the School of Engineering.

Students at other colleges who eventually wish to continue in engineering are advised to select math and science courses such as calculus, calculus-based physics, and college chemistry.

In most cases, the credit structures at each college are different and students are likely to lose some credits in the transfer process. Because of this fact, and also because the adjustment process may be somewhat easier, students may find it advantageous to transfer at the earliest point allowed by regulations. The recommended alternative is to start at City College as a freshman.

Internal Transfers

Students at CCNY who initially pursue a degree other than those offered by the Grove School of Engineering must satisfy the same course and grade entrance criteria required of students transferring from other institutions, as described in the Admissions section. Contact Undergraduate Studies (ST 209/ST 2M7; 212-650-8020) for information about the application process.

Students without a major who do not qualify for internal transfer to GSoE may seek advising from the New Student Experience Center (MR 053, 212-650-8290) or Gateway Academic Center (NAC 1/219, 212-650-6115).

Transferring Between GSoE Programs

Students are strongly advised to consult with an advisor when contemplating a new major program. It is often possible to transfer from one field to another during the first few semesters with little or no loss of credit. Transferring to a new GSoE program requires prior approval of the program to which students wish to switch.

Second-Degree Students

Students holding a valid undergraduate (four-year) or graduate degree from an accredited college and wishing to obtain an undergraduate degree in engineering or computer science will be admitted to the Grove

School of Engineering based on a transcript evaluation by the Assistant Dean for Undergraduate Studies. Second Degree students must fulfill all the same admission requirements as transfer students. Upon admission, the Assistant Dean for Undergraduate Studies will develop a suitable program for the student, which will generally waive some of the degree requirements satisfied during the attainment of the earlier degree. Students may not deviate from this program without the written approval of the Assistant Dean of Undergraduate Affairs. Students must apply for admission at least three months before the start of the semester they wish to enter. Students wishing to enter with second degree status should first visit the Admissions Office or website to obtain basic information as well as the proper forms. The second degree cannot be the same subject as the first. Students must meet the departmental residency requirements described below.

Joint/Dual Degree Students

The Grove School of Engineering has established several areas of study as jointly registered dual programs with Eugenio Maria De Hostos Community College (Hostos) and LaGuardia Community College. Students who are in these programs, and successfully attain the A.S. degree in engineering at either of the two schools, and fulfill the Grove School of Engineering's admission requirements for transfer students, are admitted to the Grove School of Engineering at the junior level, where they complete the additional course requirements for the Bachelor of Engineering degree.

The coursework necessary to earn the AS degree as part of a joint/dual degree program fulfills the course requirements of the corresponding courses in the Bachelors Degree programs at the Grove School of Engineering.

Note that the above applies only to the following two-year school engineering programs:

Maria De Hostos Community College

- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Mechanical Engineering

LaGuardia Community College

- Civil Engineering
- Electrical Engineering
- Mechanical Engineering
- For more information on the joint/dual degree engineering programs, please contact the Office of Undergraduate Studies (Steinman Hall Room 209, 212-650-8020).

Evening Students

The Grove School of Engineering offers some evening courses, but many major courses in all curricula are available only during the day.

Residency Requirements for Graduation

To obtain a degree, every transfer student and second-degree student at the Grove School of Engineering must satisfy the residency requirement of his or her chosen program. This specifies the minimum number of upper-level credits that a student must take at City College in the department(s) of the major, and must be met regardless of the number of major transfer credits the student may claim. Students applying for admission should be aware of this requirement, which is described fully in the upcoming section "Overview of the Curricula."

Transfer Credits

Transfer credit is given only for courses completed in properly accredited programs, if their material fully covers that of a similar City College course. Students must provide sufficiently detailed, authenticated curricular materials in order for course equivalency to be established. No credit will be applied for any course in which a grade lower than a "C" was obtained, and no credit will be given in which a pass/fail grading system was used.

Students should note that some transfer credits might not satisfy their particular degree requirements, but may instead be granted in the form of elective credits.

Foreign students may in some cases receive credit by examination. Before being allowed to take such an examination, the student must provide evidence that he or she has had similar courses.

The above notwithstanding, the Grove School of Engineering reserves the right to withhold transfer credit for any academic reason it considers justifiable.

Overview of the Undergraduate Curricula

The undergraduate curricula in engineering and computer science are designed to prepare the student for practice in the field of choice. Courses in the major provide a firm grounding in the principles of the various disciplines; these basic principles are applied and expanded in a series of design or similar courses. All of these courses emphasize the development of engineering viewpoints, attitudes, and methods of approach to problems.

The Undergraduate curricula offered by the Grove School of Engineering also provide a background in written and oral English and the humanities. The Grove School of Engineering offers programs that start from the freshman level and continue to the highest academic levels, up to and including the doctorate.

English and Liberal Arts Courses (General Education)

English and Liberal Arts (General Education) requirements for the Bachelor of Science degree in computer science and for the Bachelor of Engineering degrees in the engineering programs are listed below:

Writing Requirements

ENGL 11000	Freshman Composition	3
ENGL 21007	Writing for Engineering	3

FIQWS 10026 fulfills the English 11000 requirement, as well as any ENGR 10100 requirement

Foundational Courses

Foundational courses for all undergraduate programs in the Grove School of Engineering must be completed before embarking upon related courses in the major. Students with appropriate background as demonstrated by the College's Placement Exam may be exempted from some or all Foundational Courses. The foundational course for Calculus I (MATH 20100) is Pre-Calculus (MATH 19500), and this course must be passed with a grade of C or higher in order to proceed to the next level.

Pathways General Education Requirements

Grove School of Engineering students must take one course from each of the following Pathways categories: Creative Expression (CE), Individual and Society (IS), World Cultures and Global Issues (WCGI), and US in its Diversity (US)). (See General Education Requirement (Pathways) section in the Bulletin for more details). Each of Grove's academic programs may require additional General Education courses; some of which are specified while others can be selected from a list of approved courses that is posted on the Grove School of Engineering Web site and can be viewed at the Office of Undergraduate Studies (ST 209). These courses may not include courses in creativity, design, language skills, performance, professional, studio, and/or technical courses such as statistics, neuroscience, experimental psychology, etc. This list is subject to periodic review and updates..

At least two of the courses must be at the 20000 level or higher. Upon being accepted into the Grove School of Engineering, transfer students should consult with an advisor in the Office of Undergraduate Studies for Pathways regulations based on the number of credits taken at the point of transfer.

ChE, CE, CpE, and ME students must take six approved courses (one from each of the 4 Pathways categories and two additional courses from the GS0E list).

BME students must take five approved courses (one from each of the 4 Pathways categories and one additional course from the GSoE list) and Engr 30000 (Social, Economic, and Cultural Impact of Biomedical Technology) for a total of six courses.

CSC students must take four approved courses (one from each of the 4 Pathways categories), and Speech 11100 (Foundations of Speech Communication) for a total of five courses. Students may be exempted from Speech 11100 by passing a speech proficiency examination, in which case they must take another speech course.

ESE and EE students must take five approved courses (one from each of the 4 Pathways categories and one additional course from the GSoE list) and Engr 27600 (Engineering Economics) for a total of six courses.

Credit Requirements

The Bachelor of Engineering degree and the Bachelor of Science in Computer Science degree require the satisfactory completion of 126–134 credits. In the School of Engineering, not all credits passed or transferred count toward the degree. Students with non-degree courses, whether remedial or otherwise, will accumulate more credits than students whose total credits count toward their degree.

Except for special cases, the maximum number of credits allowed per semester is eighteen. Students who wish to take more than eighteen credits in any one semester must obtain permission from the Office of Undergraduate Affairs (ST 209; 212-650-8020). If permission is granted, the student will not be allowed to drop any Grove School of Engineering courses.

Residency Requirement

Residency requirements specify the minimum number of credits that students must take at City College in the department(s) of their major to obtain a degree, and must be met regardless of the number of transfer credits that a student may claim in the major area. Only courses offered by the major department(s) and prefixed by the department initials (e.g., CHE, CE), and at the 30000 level or higher, count toward residency requirements.

Residency requirements are based on the total credit in major courses in the department's curriculum, excluding pilot and experimental courses, and are listed below.

	<i>Credits</i>
Biomedical Engineering (BME)	30
Chemical Engineering (CHE)	33*
Civil Engineering (CE)	33
Computer Engineering (CPE)	30
Computer Science (CSC)	33
Earth System Science and Environmental Engineering (ESE)	33
Electrical Engineering (EE)	36
Mechanical Engineering (ME)	36

*A maximum of 6 credits may be in non-CHE technical elective courses.

Advising

The goal of the academic advising process is to help students develop meaningful educational plans that are consistent with their academic, personal and professional goals.

Engineering majors with 0-44 credits receive academic advising from professional staff affiliated with the Office of Undergraduate Studies and the academic department. An academic advising session must be scheduled at least once per semester with a staff advisor (general advisor) from this office (ST 209, 212-650-8020).

GENERAL (STAFF) ADVISORS

Biomedical Engineering - Phillip Payton (ST 403; 212-650-5283)
 Chemical Engineering – Nick Cromie (ST 321; 212-650-5748)
 Civil Engineering – Luis Alicea (ST 211; 212-650-8385)
 Computer Engineering – Sam Fenster (ST 617; 212-650-6594)
 Computer Science – Gulam Mustafa/Crystal Sawyer (ST 2M7/NAC 8/206; 212-650-8040/6137)
 Earth System Science and Environmental Engineering – Liubov Kreminska (ST 421; 212-650-8299)
 Electrical Engineering – Edward Baurin (ST 626; 212-650-8902)
 Mechanical Engineering – Deborah Moore (ST 212; 212-650-8028)

Engineering majors who have earned 45 or more credits receive academic advising that must be scheduled at least once per semester with a faculty advisor from the department. To find the name of a faculty advisor, students should consult the list posted in the office of the department chair (e.g., CE, ChE, BME). Staff (general) advisors for each program assist students throughout the year in all other administrative procedures such as help with registration and academic difficulties, Pathways General Education requirements and academic/School policies.

Each semester, an engineering advisement hold is placed on the student's record until the student has completed the required advising session. Students will then be permitted to register.

Academic Standards

Grade Point Average (GPA)

Calculation of the GPA is described in the Academic Regulations section (p. 298) of this Bulletin.

Quality Point Accumulation (QPA)

The Quality Point Accumulation (QPA) measures performance in the student's major courses.

Unless stated otherwise, major courses include only courses offered by the student's department. For example, computer science courses, although required for the civil, and electrical engineering degrees, are not included in QPA calculations for those majors. QPA calculation in the computer engineering degree counts all computer science and electrical engineering courses. Engr. 20400 is counted in the QPA for both computer engineering and electrical engineering.

Computing the QPA

In calculating QPA, the following weighting factors apply:

A+, A, A–	=	+2
B+, B, B–	=	+1
C+, C, C–	=	0
D	=	-1
F	=	-2

Pluses and minuses following the grade letter are ignored. F represents here all failing grades including F, FAB, FIN, FPN, WF, and WU. The weighting factors are multiplied by the number of credits for each applicable course, and the results of all multiplications are added

together. A QPA of zero is equivalent to a C average in the major. The CUNY-wide "F" Repeat policy, described in the Academic Regulations section (p. 298) of this *Bulletin*, by which certain failing grades are omitted from the GPA, does not apply to Engineering QPA calculations.

Use of Graduate Courses

Permission to substitute a graduate course for an undergraduate course requires senior status and a GPA of 2.75 or better plus the approval of the chair of the department in which the course resides, the Assistant Dean for Undergraduate Studies.

Retaking Engineering Courses

On application by the student, the Assistant Dean for Undergraduate Studies will allow students in their senior year to repeat courses in order to improve their major QPA. Only five such retakes will be allowed (not more than two per semester) and these must be courses for which the previous grade was D. No course, once passed with a grade of D, may be retaken more than once. If a student is permitted to retake a course, both the new grade and the original grade of D will be counted in the major QPA.

Pass-Fail Option

Students enrolled in the Grove School of Engineering must take all courses for a qualitative letter grade. That is, they are not allowed to take the pass-fail option except when it is the only grade option for a course.

College-Wide Examinations

CUNY's Skills Assessment Tests (CATs)

All CCNY students are required to meet the University's skills proficiency requirements based on SAT, ACT, or NY State Regents test scores. Students who do not achieve the required scores on SAT I or Regents Exams can satisfy the skills proficiency requirements by passing the CUNY Assessment Tests in Reading, Writing and Mathematics.

MATH 3 Testing: Placement into Advanced Mathematics Courses

All new students - whether or not they are math proficient - are required to take the CUNY Assessment Test in Mathematics (Math 3). Test results will be used to place students in the appropriate mathematics course at their college.

Probation and Dismissal

Students are considered to not be in good academic standing in the following cases:

- If they do not maintain a GPA of 2.0 (or 1.75 or 1.5 for students who have attempted fewer than 25 or 13 credits at CCNY, respectively);
- If they do not maintain a QPA of at least zero;
- If they need to take a course for a third time;
- If they have withdrawn from 12 credits in a two-year period.

Students that are not in good academic standing may be required to file an appeal with the GSoE Office of Undergraduate Studies to be allowed to remain in a GSoE degree program. If an appeal is granted, the student will be placed on academic probation.

As long as they are on academic probation, the students will be restricted to twelve, or fewer, credits per semester and/or the terms of an academic contract. Students on academic probation whose grades do not improve will be dismissed from the School of Engineering, unless another appeal is granted for the continuation of studies.

Definitions of probation and satisfactory academic progress are located in the Academic Regulations section of this *Bulletin*.

Committee on Course and Standing

The Committee enforces academic standards and graduation requirements. Its responsibilities are to

- Adjudicate student appeals of dismissal from the GSoE,

- Adjudicate variances in graduation requirements in individual cases,
- Adjudicate on change of grade appeals.

All requests to the Committee must be submitted in writing to the Office of Undergraduate Studies. The Committee is the final authority on questions of courses, probation, dismissals, and graduation.

Summary of Graduation Requirements

In order to be eligible for graduation, the student must meet the following criteria:

- Achieve a minimum overall average of C (GPA of 2.0).
- Achieve a minimum quality point accumulation (QPA) of zero.
- Obtain a grade of C or better in specified mathematics, science and major courses in the program.
- Satisfy the credit distribution requirements of the degree.
- Fulfill the residency and credit requirements of the degree.

Cooperative Education Plans in Engineering

Grove students are assisted with their professional development throughout their undergraduate studies and they can apply for competitive cooperative education positions including co-ops and summer internships. Assignment locations are not only in the New York metropolitan area, but throughout the nation. Students who participate in cooperative education can expect to benefit by the experience in many ways, among the more important of which are:

- Learning to put theory into practice.
- Earning financial support for college.
- Increasing motivation and stimulation to continue academic studies.
- Growing in maturity, practicality, and responsibility.
- Greatly enhancing job opportunities upon graduation.

In general, to participate in cooperative education the student must have completed at least 30 credits towards the degree and meet the required academic standards as stipulated by the cooperative education employer. It is important to note the following:

- No academic credits are given for cooperative education work experience; and participation in cooperative education normally extends the time needed to complete the degree requirements.
- Work periods are not just during the summers, although the summer may be included in a fall or spring work assignment.

Grove students have participated in cooperative education assignments with employers that have included governmental agencies such as Brookhaven National Laboratory and NASA, as well as large private corporations such as Merck, IBM, Toyota, Boeing, and GE. Students interested in cooperative education should consult with the Office of Undergraduate Studies in the Grove School of Engineering.

Student Responsibilities

For academic matters, students are responsible for the material covered in the Academic Regulations section (p. 298) of this *Bulletin*, in the introductory section of the Grove School of Engineering portion, and in their specific department write-ups. For matters related to conduct, students are responsible for the disciplinary material covered in Appendix B of this *Bulletin*.

Department Programs

Prescribed curricula for the eight Grove School of Engineering programs are presented in the following pages. Mathematics and science subjects upon which long sequences depend are of prime importance and should be taken as soon as the student is ready for them. If a section in one of

these subjects is closed the student should, if possible, select a different section of the same subject and rearrange other subjects as necessary. Freshmen and sophomores should pay particular attention to early completion of the prescribed work in mathematics, physics, chemistry, and computer science.

It is the student's responsibility to meet with a Grove advisor each semester for program planning and advisement. Students with specific problems may always consult with the Office of Undergraduate Studies, ST 209.

Students who are behind in completing prerequisite courses should consider attending one or more summer sessions. The math and basic science courses and many liberal arts non-science courses are generally offered during the summer, as are some Grove School of Engineering courses.

Curricula in engineering and computer science are designed so that the full-time day student, sustaining no failures, may complete the bachelor's curriculum in four calendar years. Often, however, because of the timing of courses or schedule conflicts, a student will have to attend one or two additional semesters. In addition, because certain courses in all curricula are considered difficult, students may elect to take fewer total credits during the semesters in which they take those courses. This might also lengthen their stay at the College. Finally, students who must hold a job, even a part-time job, should reduce their course loads below those recommended in the program descriptions. Most math, science, and engineering courses are sufficiently challenging to require a full measure of the student's energy and attention; the longer stay in the College that this delay entails is almost always compensated for by higher grades.

Evening students should select math and science courses in preference to humanities courses on beginning their college work, since the humanities courses will round out programs in later years when schedule difficulties might prevent the selection of a full program of technical courses.

Where courses have prerequisites, the prerequisite must be taken before registering for the desired course. Exceptions must be approved in writing by the department chair and approved by the Assistant Dean of Undergraduate Studies. Students who register without such permission risk being dropped from the course.

The Grove School of Engineering reserves the right to change curricular requirements for matriculated students at any time if such changes are necessary to remain in compliance with the guidelines of the Accreditation Board for Engineering and Technology. Also, courses will not be given unless warranted by enrollment levels.

Every effort has been made to ensure that the material in this section of the Bulletin is consistent with the material presented in the Academic Regulations section of the Bulletin and in the individual program sections. If there are inconsistencies, students are strongly advised not to attempt their own interpretation but to consult with the Office of Undergraduate Studies, ST 209. An erroneous interpretation of the requirements by a student may not be accepted by the College.

Laboratories and Research

Biomedical Engineering

The Department of Biomedical Engineering's teaching laboratories provide students with hands-on experiences using state-of-the-art equipment. A wet laboratory is equipped to maintain cell cultures and includes a biological flowhood as well as an optical and fluorescence imaging system. A second undergraduate laboratory is used for circuit building and electronic testing as well as the development of senior design projects. Equipment in this lab includes bioinstrumentation sensor kits, strain gage measurement acquisition systems, digital

oscilloscopes, laptops running Matlab and Labview, and a 3D printer used to make models and project parts. The department also maintains a computer lab that includes 28 desktop PCs running MS Office, Matlab, Mathematica, PSpice, and Solidworks. In addition to these labs, a machine shop and a bio-characterization lab with a flow cytometer and protein characterization system are also available to undergraduate students.

Chemical Engineering

The Chemical Engineering Department provides six laboratories as part of its teaching facilities. These are the Chemical Engineering Science Laboratory, the Unit Operations and Control Laboratory, the Particulate Science Laboratory, the Interfacial Chemistry Laboratory, the Bioprocessing Laboratory, and the Computer Laboratory. Safety procedures and training are emphasized in all laboratories.

In the Chemical Engineering Science Laboratory students make measurements of various thermodynamic properties such as vapor pressure and of transport properties such as viscosity, thermal conductivity and gas diffusivities. The data is then used to estimate the parameters in the appropriate constitutive equations using the methods learned in the statistics course. Students also study the mechanism of conductive, convective, and thermal radiation heat transfer.

In the Unit Operations and Control Laboratory students get hands on experience operating and characterizing the behavior of a wide variety of the types of equipment used in chemical plants. Among these are several heat exchangers, pumps, a piping network for studying fluid flow, flow meter apparatus, a distillation column, a chemical reactor, a packed column, a fluidized bed, a mixing tank, a drying oven, and a gas membrane separator. Most equipment is of pilot plant scale. Many experiments have computer interfaces. The distillation column is equipped with a control module that gives the students experience with the use of feedback control in the operation of equipment. Students also learn how to use a process chromatograph in conjunction with some of the other experiments.

The Powder Science and Technology Laboratory is attached to the course with the same name (ChE 45200) and is given together with it as demonstration of theoretical principles presented in class. The students are first introduced to powder characterization such as particle size, size distribution (using standard sieves and a light scattering instrument) and shape and surface structure using optical and electron microscopes. Instruments to measure powder specific surface area and pore volume using gas adsorption (BET and gas pycnometry) and mercury intrusion are also presented. Characterization of bulk powders properties is achieved in the Jenike Shear Cell used to measure powder-yield loci at different initial compression levels. This is a special instrument, characteristic of powder engineering, used to determine powder flowability as well as for the design of powder storage vessels such as hoppers and bins. Finally, the MikroPul Hosokawa Micron Powder Characteristics Tester provides six mechanical measurements with one easy-to-use instrument, including 1) angle of repose, 2) compressibility, 3) angle of spatula, 4) cohesiveness, 5) angle of fall and 6) dispersability. Measuring such properties has great importance in the design of storage hoppers, feeders, conveyors and other powder processing equipment. The laboratory also has a significant research component dedicated to the measurement of dry powder flows in different geometries and the study of powder granulation (size-enlargement). Principles of these processes are also demonstrated to students using the existing research equipment.

The Interfacial Chemistry Laboratory provides students with exposure to some surface modification chemistry and the standard techniques used for the characterization of surface properties. Written and verbal reports are required. In addition to use of instrumentation, students will familiarize themselves with surface preparation and modification techniques, including self-assembly, evaporation, spin coating, and Langmuir-Blodgett techniques.

The Bioprocessing Laboratory is equipped with a bioprocess system that includes a fermentation bioreactor, an ultrasonic cell homogenizer, an isoelectric focusing prep cell, and, for final purification, a

chromatographic separation system. Additional equipment includes Applikon 3 and 7 liter fermenters with an ultrasonic cell separator to permit cell recycle. On-line instrumentation includes an Aber Instruments live-cell probe and a methanol feed control system. All modules are computer accessible and capable of feedback control. This lab is used in conjunction with both the graduate and undergraduate courses in bioprocessing to provide hands on training. Typical experiments are introductory microbiology, bioreactor operation and control, and protein purification.

The computer laboratory provides students with access to approximately 24 PCs and two printers on a local area network. Applications software including the Aspen Engineering Suite, SuperPro Designer, Visio, Mathematica, and Matlab are available on these machines as well as E-mail and Internet access capability. The lab also provides workspace so that student design or study teams can work together. This lab is available from 9 AM to 9 PM weekdays and on weekends by previous arrangement.

Civil Engineering

The Department of Civil Engineering has the following laboratories: Materials of Engineering, Soil Mechanics, Fluid Mechanics, Environmental Engineering, Highway and Airfield, and Traffic/Transportation Engineering.

The Materials of Engineering Laboratory houses an Instron 8500 Series Universal Testing Machine. This machine is digitally controlled and capable of applying 55 kips (250 kN) dynamic loads. Supporting electronic control, data acquisition and computer software systems are available. Additional equipment for the static, dynamic and fatigue testing of materials includes testing machines for tension, compression, transverse-bending and torsion investigation. The laboratory contains hardness testing machines, impact testers, electric strain gauge consoles, and assorted peripheral equipment. Facilities for casting, curing and testing concrete are also available and include the following: walk-in variable temperature and humidity control environmental chamber, diamond tipped saw for cutting concrete, computer controlled servo-hydraulic compression test machine for 600 kip load capacity, ultrasonic pulse-velocity meter, and maturity meters. Complete facilities for nondestructive evaluation of materials and structures are also available and include: ground-penetrating radar with 400 MHz antenna, ultrasonic transmitters, oscilloscopes, function generators and accelerometers.

The Soil Mechanics Laboratory is equipped to perform standard identification tests of soils, such as grain size distribution, liquid and plastic limits, shear strength, and compaction properties. In addition, facilities to perform detailed testing of undisturbed samples (consolidation and triaxial shear) are available and used regularly. A moist room is available for long-term sample storage.

The Fluid Mechanics Laboratory is equipped for studying both compressible and incompressible fluid media. Flow rates up to five cubic feet per second of water are provided by each of three independent high-pressure systems equipped with constant-head controls. Two low-constant-head supply tanks located in the laboratory provide lesser discharge capacities. The laboratory contains a 52-foot long tilting flume, a water tunnel, a subsonic wind tunnel, an air jet, pumps, turbines, a hydraulic bench, and various units for the study of frictional phenomena involving water and oil.

A one-dimensional Laser Doppler Anemometer (LDA) is used for the study of flow velocities in pipes and near the flow boundaries. In addition, the lab has a state-of-the-art wave tank, 6 ft. wide by 4 ft. high and 40 ft. long. It is equipped with a computer controlled five-paddle wave generator. This system can produce single waves, random waves, and angle waves. A two-dimensional Laser Doppler Velocimeter (LDV) equipped with computer controlled 3-D traverse and fully automated data acquisition system is used in the wave tank for studying beach hydraulics and off-shore similitudes. The lab is also equipped with a tilting sand flume for studying flow through highly porous media and groundwater contamination. A fully automated freeze and thaw machine is also available for graduate research work.

The Environmental Engineering Laboratory is equipped for experimental evaluation of unit processes and operations in water and wastewater treatment as well as analysis of all physical, chemical and microbiological water quality parameters. The experimental facilities include settling columns, suspended and attached growth biological reactors, computer-controlled bioreactor for kinetic studies, a bench scale UV chamber, a 12-gpm 15-foot bubble contactor for ozone studies complete with ozone generator, gas and liquid phase ozone residual monitors and off-gas destructor, a 1000-ft pipe loop system for water instability studies, and all conventional experimental devices used in determination of chemical dose requirements. An environmental chamber for temperature-controlled experiments is also available.

The analytical capabilities of the laboratory include gas chromatography-mass spectrometer with purge/trap, inductive-coupled plasma spectrometer (ICP) gas chromatograph with EC and FID detectors, total organic carbon analyzer, ion chromatograph, water quality autoanalyzer, UV-visible doublebeam spectrophotometer with stopped-flow device, and phase contrast/epifluorescence research microscope. Field monitoring equipment includes water quality monitors with multiple probes and fluorometers.

The Traffic/Transportation Engineering Laboratory has both personal computers and UNIX workstations with their peripherals to provide students opportunities to work with traffic and transportation software for course work and transportation research. The laboratory has a variety of software, including SOAP84, HCS, PASSER II-90, TRANSYT-7F, NETSIM, AAP, PRIMAVERA, AutoCAD, and software for GIS. The laboratory also contains basic equipment necessary to conduct traffic engineering studies such as traffic counters and measuring wheels.

The Highway and Airfield Laboratory offers facilities for investigating the properties of the basic materials and mixtures that comprise pavements. A variety of strength and stability equipment and other apparatus are available for determining rheological and physical properties and for experiments in designing and testing bituminous mixes. The additional facilities of the Soils and Materials Laboratories make possible the study of mineral aggregates and their blends, soil-stabilization phenomena, and mix-design and properties of Portland cement concrete. Other facilities in the Chemical Engineering Department's Materials Research Laboratory extend the capacity to conduct thermoanalytic studies on standard and composite materials.

Computer Engineering

The Computer Engineering Program shares laboratory facilities in the Departments of Computer Science and Electrical Engineering.

Computer Science

The Department of Computer Science has substantial computing facilities, including two student PC laboratories, large Linux labs, and specialized laboratories for computer architecture, image processing, network protocols, operating systems, and parallel programming. A computer vision lab is under construction. Wireless and high-speed Internet connections are provided. All labs are equipped with laser printers.

The Linux labs are equipped with state-of-the-art Dell workstations running Red Hat Enterprise Linux. These labs provide software for graphics, image processing, numerical computation and logic design, and a variety of programming languages (such as C/C++, Java, Fortran, Scheme, Assembly, Python and Perl). The labs also provide database development environments, such as Oracle and MySQL. The PC labs utilize the Microsoft Windows XP environment, and provide a wide range of software for both students and faculty. The Computer Architecture Lab is equipped with high-end IBM, Dell and Sun workstations. Students use VHDL to program reconfigurable boards supplied by Altera. The Operating Systems Lab is equipped with Sun Blade workstations.

The Image Processing Lab features dual-processor Dell workstations with high-end Nvidia Quadro 4 graphics boards, running Linux. The Network Protocol Lab is equipped with the latest networking devices, such as CISCO switches, routers, ATM switches and a network traffic

simulator/analyzer. Also deployed are high-end Sun Ultra workstations and video capture capability for studying video multicasting. The Parallel Programming Lab provides a small Beowulf cluster based on Red Hat Enterprise Linux. This lab provides students and faculty with a prototyping environment for development and study of high performance computing.

Earth System Science and Environmental Engineering

ESE students take advantage of teaching laboratory facilities in the respective departments where the laboratory course is offered. These include such facilities as the Hydraulic and Environmental Labs in the CE Department, EAS Department Geoscience and Analytical labs, etc. The Remote Sensing/GIS computer laboratory facility is open to ESE students for Remote Sensing and GIS courses as well as to conduct the Senior Design project, independent study, or research. Faculty participating in the ESE program also have state-of-the-art laboratories that are utilized for student research and design projects. These include the EE Department Optical Remote Sensing Lab, the CE Department Hydrology Lab, the NOAA CREST Satellite Receiving Facility, and the Chemistry and Analytical Labs in the CCNY Science Division. In addition to the NOAA CREST Satellite facility, the Center also operates an air sampling shed on campus, and a number of local and regional networks including lidar and radiometer networks, and the New York City Meteorological Network for air dispersion and micro-climate studies. Additional field work is supported through a number of research projects (from Navy, NOAA, NASA, etc.) and include coastal water studies, snow and ice studies, soil moisture studies, etc. at various locations nationally and internationally.

Electrical Engineering

The undergraduate EE laboratory facilities comprise the core teaching laboratories, advanced senior level design laboratories and computer support facilities.

The computer-controlled core laboratories are designed to give students hands-on experience on both analog and digital electronic circuits and in measurement devices currently used to characterize circuits and systems. Data acquisition using LabVIEW computer control software with GPIB interfaced measurement equipment is used to give the students hands-on experience in the fundamentals in communications, computer and control engineering.

The two introductory core labs consist of laboratory stations (2 students per station) which have the following computer and measurement equipment: personal computers running both LabVIEW and Electronics Workbench (analog and digital circuit simulation software); a GPIB plug and play controller card; a data acquisition-generation board with 8 analog input lines and 2 analog output lines, 24 digital scope with GPIB storage module; a Hewlett Packard GPIB and RS-232 interfaced Digital Multimeter; a Hewlett Packard Triple Output Power Supply, a Hewlett Packard GPIB and RS-232 interfaced 15 MHz function generator.

The Analog Communications Laboratory uses the Lab-Volt Company's signal generators, receivers, noise generators, and spectrum analyzer for the analysis of the performance of AM, SSB, DSB, and FM communication systems.

The Computer Engineering Laboratory is designed to give students the capacity to perform high-level microcontroller programming and virtual emulation. The laboratory consists of 5 stations (2 people per station) each with: a PC; a Motorola Microcontroller Development System, a Motorola Emulator and specialized assembler software and C Cross compilers. In addition, the laboratory has a Hewlett Packard 16-channel logic analyzer and assorted electronics components for laboratory exploration.

The advanced design laboratories include Local Area Network (LAN), Photonics Engineering, and Advanced Electronics. The LAN laboratory consists of IBM Multimedia PC's, Protocol Analyzers and several network design and simulation packages such as OPNET and COMNET. In addition, two ATM switches (2.4 Gbps) and a CISCO Router are available.

The Control Engineering Laboratory uses the Feedback Inc. analog servo-fundamentals trainer, which consists of an analog unit and a mechanical unit. The mechanical unit has a servomotor with position and velocity sensors. The analog unit allows students to wire the servomotor in a closed loop configuration and independently vary the position and velocity feedback gains. The trainer is interfaced to a PC running LabView software to acquire and display signals on a virtual oscilloscope. The six stations are networked to a printer to allow students to print the virtual oscilloscope display.

The Photonics Laboratory is designed to give a variety of laboratory experiences in optics, lasers, spectroscopy and fiber optics. Equipment includes laser diodes, HeNe lasers, a white light source, a fiber optic spectro-radiometry system, single and multimode fibers, laser power meters and a variety of optical components.

The NASA Remote Sensing Computer Laboratory is designed to provide computer resources to students involved in environmental engineering and remote sensing.

The laboratory facilities are supported by significant computer resources which include the Department network comprising over 120 workstations.

Mechanical Engineering

The Department of Mechanical Engineering provides separate laboratories for the study of aero-thermal-fluid engineering, manufacturing, material science, mechatronics, dynamics and controls, and CAD. A Senior Design Projects Fabrication and Test Laboratory and a machine shop serve the entire department. A personal computer center, open all day, is available for the convenience of students. In the Aero-Thermal-Fluid Laboratory, major experiments involve a refrigeration unit, a water turbine unit, a wind tunnel unit, an air pipe flow unit, a fin heat transfer unit, and a heat exchanger.

The Engineering Materials Laboratory includes extensive facilities for the preparation of specimens for metallographic examination using modern digital imaging analysis system, testing machinery for tension, compression, hardness, impact, fracture, fatigue, stress relaxation, and ultrasound characterization; equipment for heat treatment; as well as recording and projection devices.

The Mechatronics Laboratory teaches the use of various electromechanical devices, sensors and actuators. The devices include strain gauges, thermocouples, piezoelectric accelerometers, LVDT's, instruments for signal generation, filtering and amplification, stepper and DC servo motors, linear slides, and assorted electromechanical items (such as solenoids, relays, micro-switches, infrared proximity sensors, piezoelectric buzzers, strobe lights, fans, blowers, etc.). All these devices are controlled by PC-based data acquisition, microcontrollers, and programmable logic controllers (PLCs).

The Dynamics and Controls Laboratory contains equipment for dynamic balancing, vibration testing, and various feedback control units for rectilinear and torsional mechanical systems, level and flow, thermal and pressure systems and digital and analog servo-motor systems.

The Computer Aided Design Laboratory facility has twenty-six Dell OptiPlex 960 computers, a Dell PowerEdge 2500 server, two HP Color LaserJet 4700dn printers, an HP LaserJet P4015dn printer, and an LCD projector. The Department also has a Multimedia Learning Facility which includes twenty-six Dell Dimension PC's, document camera, LCD projector, and whiteboard as well as a Nuclear Computation Lab with twenty Dell OptiPlex 960 computers running PCTAN software. In addition, the Department maintains eighteen Sun UNIX workstations and fifteen Dell OptiPlex 9010 PC's in its manufacturing laboratory. These systems are equipped with mechanism design, mathematics, finite element, boundary element and computer-aided manufacturing software, including Solid Works, LS-DYNA, ABAQUS, MathCAD, MATLAB, Mathematica, FLUENT; and NASTRAN-4D.

A modern Computer-Aided Manufacturing (CAM) Laboratory facility contains four CNC machining centers and a computer-integrated

manufacturing (CIM) system, 3-D printer, together with industrial grade robots: two articulate arm types and one SCARA.

Somewhat more specialized laboratories, established to facilitate advanced experimental research work, provide specific concentrations of apparatus and equipment to allow the study of various phenomena in such fields as solid mechanics, composites, turbomachinery, environmental and fluid sciences, aero-sciences, and micro/nano manufacturing.

The machine shop is well equipped for fabricating and maintaining all experimental facilities, both undergraduate and research.

Research

In recent years, several million dollars in grants per year have been awarded to City College Grove School of Engineering faculty for conducting research projects that have attracted international attention. These faculty members are an integral part of the undergraduate teaching team. The grant agencies include NSF, NASA, ONR, U.S. Army, AFOSR, EPA, USDOT, NYCDOT, DOE, ARPA, and NIH. City College is also connected to ARPANET.

A brief sampling of the ongoing research activities follows.

In the area of Electrical Engineering: digital slow-scan video, packet voice video systems, spread spectra, semiconductors, integrated circuits, digital signal processing, image processing, material characterization, digital optical computing, machine vision, identification and control, microwave engineering, parallel processing, knowledge-based engineering, robotics, computer communications, and local area networks.

In Biomedical Engineering: cardiovascular engineering, including fluid and mass transfer aspects of arterial disease and microcirculatory heat and mass transfer; neural engineering, including analysis of nervous system function at multiple levels (single channel, single cell, tissue, whole animal, and human cognitive levels) and development of stimulation protocols to treat brain disorders; musculoskeletal biomechanics, including understanding the mechanism of musculoskeletal maintenance and adaptation and characterization of bone properties using ultrasound; and tissue engineering, including use of micro- and nanotechnology along with cell and molecular biology to address issues related to disease progression (cancer metastasis), development of replacement tissues, and high throughput assessment of cell death mechanisms.

In the area of Chemical Engineering: turbulence, low Reynolds number hydrodynamics, two- and three-phase bubble flow in capillaries, arterial fluid flow, cholesterol metabolism models, drug release polymers, tissue engineering, fluidized and trickle beds, coal liquefaction, conversion catalysis and hydrolysis, low-temperature electromagnetic properties of semiconductors and coal chars, extraction with mixtures of critical solvents, dynamic process simulation systems, dynamic modeling and control of FCC, coal gasification, municipal waste incineration and power generation systems, control of complex processing systems.

In the area of Computer Science: computer graphics, image processing, multimedia, virtual reality, computational geometry, mathematics of computation, cryptography, artificial intelligence, neural networks, mathematical fluid dynamics and simulation, networks, distributed computing, information management and virtual organization, economics of information, and social issues in computing.

In the area of Mechanical Engineering: fracture mechanics and crack propagation, composite materials characterization and ultrasound microscopy, random vibrations, turbomachinery, aerodynamic turbulence, gas dynamics and shock waves, aerostructures, climate change, MEMs, smart materials and moving phase change boundaries.

In the area of Civil Engineering: earthquake effects of structures and soil/structure interaction, fracture mechanics, creep effects in concrete, probabilistic methods in structural design, seepage of pollutants through soil/water systems, solid waste disposal, modeling and simulation in travel demand forecasting, value capture financing

techniques in transportation, highway maintenance systems and load analysis for highways.

Institutes and Centers

Institute for Biomedical Engineering

The Institute is a uniquely integrated endeavor dedicated to providing students with access to a diverse faculty, unique research opportunities, and encouragement to pursue graduate studies in biomedical engineering. It is part of the New York Center for Biomedical Engineering, NYCBE, a consortium of researchers in the Grove School of Engineering at City College, Albert Einstein College of Medicine, the Cardiovascular Research Foundation, Columbia College of Physicians and Surgeons, the Hospital for Special Surgery/Weill Medical College of Cornell University, Mount Sinai School of Medicine, and Memorial Sloan-Kettering Cancer Center. Since its founding in 1994, faculty and staff from more than a dozen health care institutions in the New York area have either taught courses in the center or have served as research advisors for student projects.

Benjamin Levich Institute for Physicochemical Hydrodynamics

The Benjamin Levich Institute is an internationally recognized research center for the study of fundamental problems of flow and transport in complex fluid, fluid-like media and interface systems. Faculty members participating in the Institute are from Chemical Engineering, Mechanical Engineering, and Physics. With the Institute's excellent laboratory and computational facilities, their current scope of research is in five major areas: granular flows, low Reynolds number hydrodynamics, non-Newtonian fluid mechanics, computational fluid mechanics, and transport along interfaces.

Institute for Municipal Waste Research

The principal objective of the Institute is to mobilize the excellent intellectual resources of the CUNY faculty to assist in solving the urgent problem of effective, economical, and efficient disposal of municipal waste in New York City. The research program entails development of innovative technologies to treat municipal wastewaters in order to safeguard the quality of the surrounding natural waters and new disinfection methods that will protect the quality of drinking water. The Institute's research is funded in part by New York City and State agencies.

Institute for Ultrafast Spectroscopy and Lasers (IUSL)

The IUSL is a multidisciplinary research laboratory devoted to conducting basic and applied research in the frontiers of photonic science and technology; to help develop a skilled workforce for academic and industrial sectors by providing unique educational and training opportunities for students and scholars; to provide a core for major photonic initiatives, as well as to identify and participate in the development of emerging technology areas. Faculty members, researchers and students from the Physics, Electrical Engineering, Earth and Atmospheric Sciences Departments of CCNY, and visiting scholars from abroad participate in various IUSL research projects.

CUNY Environmental Crossroads Initiative

Created in 2008, the CUNY Environmental Crossroads Initiative is an internationally recognized research center dedicated to the analysis of strategic local, regional, and global environmental challenges. As climate change and environmental problems gain a new sense of urgency around the globe, the collaboration of experts from various disciplines is the key to managing such diverse challenges as coping with climate extremes, feeding a population that continues to grow, establishing energy security while preserving ecosystem services and biodiversity, protecting human health, and sustaining economic development. For more information visit: <http://environment.asrc.cuny.edu/>.

CUNY Institute for Transportation Systems

The CUNY Institute for Transportation Systems has been established at The City College in cooperation with other units of the City University of New York. The mission of the Institute is to carry out interdisciplinary

research on all modes of transportation and to train transportation professionals.

CUNY Institute for Urban Systems (CIUS)

CIUS is a multi-campus CUNY institute that investigates urban infrastructure using the themes of new technology, infrastructure, institutions and finance. The Institute combines engineering and social science research in addressing major problems of urban areas.

Center for Advanced Engineering Design and Development (CAEDD)

The primary mission of CAEDD is to conduct, coordinate, and promote design-oriented, applied research and development for industry. It also encourages and fosters interdisciplinary engineering design and manufacturing education by the academic departments in the School of Engineering. CAEDD is an interdepartmental unit which transfers faculty research and expertise in the Grove School of Engineering into advanced technology needed in industry. It also serves as an outreach and referral service for small and large industrial firms seeking assistance with technical problems.

CUNY Energy Institute

The Energy Institute was formed in 2008 to consider new approaches to large scale energy production and storage. It serves and comprises of researchers from all campuses of the City University of New York, with a mission to create, evaluate, and provide a seed for the implementation of advanced energy technologies. These technologies would provide low cost, sustainable energy solutions tailored for the various environs that make up New York State, from preserving the serenity of the Adirondack region to meeting challenges of powering New York City. The Energy Institute takes a comprehensive approach to this problem, combining fundamental studies of emission-free energy production and energy storage through new materials and mechanisms.

NOAA-Cooperative Remote Sensing Science and Technology Center (NOAA-CREST)

CUNY Remote Sensing of the Earth (CREST) Institute is a CUNY wide institute dedicated to conducting cutting edge research and education in monitoring and predicting the environmental condition of the Earth and help in protecting the Earth's eco-system. NOAA CREST Center is housed within the CUNY CREST Institute. Established in 2001, the NOAA-CREST Center is led by the City University of New York and brings together Hampton University, University of Puerto Rico at Mayaguez, Bowie State University, University of Maryland Baltimore County, and Columbia University and industrial partners like Raytheon & Northrop Grumman. The CREST vision is to contribute to the development of a world-class cadre of faculty, students, and researchers that will gain knowledge and expertise in cutting-edge research in science, engineering, and technology with special emphasis on satellites and remote sensing of the Earth. For more information visit: <http://crest.cuny.cuny.edu/>.

International Center for Environmental Resources and Development (ICERD)

This Center was established to bring together multidisciplinary teams of scientists and engineers to help tackle the diverse problems of water resources and environmental issues. It focuses on water resources and environmental research; air and water pollution crisis management; remote sensing and global change impact; environmental technology; and research, education and training programs.

University Transportation Research Center (UTRC)

UTRC is a federally supported center that conducts research, training and technology transfer on issues of surface transportation, including road systems, public transportation and multi-modal systems. It is a consortium of twelve major universities, with the lead at CCNY.

Center for Algorithms and Interactive Scientific Software (CAISS)

CAISS is a research center where mathematicians and computer scientists come together to collaborate on different projects. It grew out of work on a graphically driven, easy to use, software package called MAGNUS, designed to answer questions about and to carry out experiments with finitely presented groups. This work has led to the development of a general platform, which can house a host of zero

learning curve software packages. The first of these packages, one for statistics called Caiss-Stat, is now nearing completion. This is only one of the many projects being undertaken by CAISS which include continued work on MAGNUS, new cryptographic protocols to ensure electronic security, work on a universal password, all of which make use of the complexity of finitely presented groups. In addition, CAISS is developing new games or puzzles, based on group theory. CAISS also manages the New York Group Theory Cooperative, which organizes the NY Group Theory Seminar at the Graduate Center. The facilities of CAISS include a 132 node Beowulf cluster, which is being used for work in computational biology and group theory and a small computer lab equipped with CAISS developed software.

Center for Water Resources and Environmental Research

The Center for Water Resources and Environmental Research (CWRER) was established in 1993 in order to meet the needs for interdisciplinary study and education in the area of the natural resources, waste, and environment. The Center's main objectives are: to conduct multi-disciplinary research on protection of the environment and minimization of pollution hazards to the water resources, hydrological, and ecological systems; to develop and demonstrate new technologies for the treatment and disposal of natural water supplies and wastewater; to cooperate on the global scale to protect the precious resources that sustain human life; to educate and train personnel for management, supervision, and operation of environmental and water resources management systems. For more information visit: <http://crest.cuny.cuny.edu/>.

Honors, Awards, and Professional Societies

Awards and Prizes

Awards and prizes presented by the Grove School of Engineering are listed below. For detailed information on these and on other award opportunities, contact Assistant Dean Rawlins Beharry, 212-650-8040, Chair of the Honors and Awards Committee.

Association of Old Crows Award
Engineering Alumni Awards
Engineering SEEK Scholars Award
Engineering Student Support Award
Theodore Charros Scholarship
GEM Fellowships
Donald Griff Scholarships
Grove Foundation Scholarship
Paul A. Karmel Memorial Award in Electrical Engineering
Rose Lederman Scholarship
Sam and Clara Linder Scholarship
Patell Memorial Award in Chemical Engineering
Pope, Evans, and Robbins Scholarships
Judith Resnick Award
Society of Military Engineers (SAME) Scholarship
David B. Steinman Awards

Honor Societies

Tau Beta Pi is the United States Engineering Honor Society. Seniors and juniors in the top fifth and top eighth of their respective classes are eligible for election under rigorous standards of scholarship, character, leadership, and service to the School. Honor societies for individual disciplines have chapters in most of our Engineering departments.

Eta Kappa Nu is the national electrical engineering honor society, which has for its purpose the reward and stimulation of high scholarship and professional achievement. Outstanding senior and junior students are eligible for membership; election is based on unimpeachable character and undoubted ability, as evidenced by scholarship.

Chi Epsilon is the national civil engineering honor society. Juniors and seniors in the top third of their respective classes are eligible for

membership; election is also based on character, practicality, and sociability.

Omega Chi Epsilon is the national chemical engineering honor society. Membership is limited to students who have completed a substantial number of chemical engineering credits and have demonstrated a high level of scholastic achievement and excellent character.

Golden Key International Honor Society is an academic honors organization recognizing scholastic achievement and excellence in all undergraduate fields of study.

Professional Societies and Organizations

Student chapters of the following societies have been formed: American Society of Civil Engineers (ASCE), American Institute of Chemical Engineers (AIChE), American Society of Mechanical Engineers (ASME), Biomedical Engineering Society (BMES), Institute of Electrical and Electronic Engineers (IEEE), Society of Automotive Engineers (SAE), Society of Manufacturing Engineers (SME), American Society of Heating, Refrigeration, and Air-conditioning Engineers (ASHRAE), American Institute of Aeronautics and Astronautics (AIAA), and Association for Computing Machinery (ACM). Broad-based engineering organizations on campus include the National Society of Black Engineers (NSBE), Latin American Engineering Student Association-Society of Hispanic Professional Engineers (LAESA-SHPE), Society of Women Engineers (SWE), and Korean-American Scientists and Engineers Association (KSEA). During each semester, lectures are delivered before these societies by prominent professionals; students are also encouraged to present their own papers. In addition to these professional and technical societies, the Grove School of Engineering sponsors a Concrete Canoe Club, open to all Grove students. For more information of these engineering student organizations, contact Assistant Dean Rawlins Beharry, 212-650-8040, Chair of the Engineering Students Council of Presidents and Leaders.

National engineering societies offer students substantial competitive awards for papers, oral and poster presentations, and design competitions on certain specified topics. Other competitive awards for research are offered to graduates by these societies.

Department of Biomedical Engineering

CUNY & Wallace Coulter Distinguished Professor Mitchell Schaffler,
Chair • Office: ST 401 • Tel: 212-650-6707

General Information

The City College offers the following undergraduate degree in Biomedical Engineering:

B.E. (BME) (p. 260)

Programs and Objectives

Biomedical engineering (BME) is the application of engineering principles and physical and mathematical concepts to solve problems in medicine and biology. Biomedical engineering has been a critical component of the technological advances in medicine and health care delivery that has dramatically transformed the prevention, diagnosis, and treatment of disease in the last few decades. Whether in the area of biomedical imaging, biosignal processing, medical instrumentation, biomechanics, biomaterials and implants, drug delivery, or cell and tissue engineering, these advances are continuing to accelerate.

Our undergraduate biomedical engineering program consists of an innovative, interdisciplinary curriculum that will produce critical thinkers with effective problem-solving skills. We believe a biomedical engineer with a bachelor's degree should be well grounded in the basic engineering principles found in traditional mechanical, chemical, and electrical engineering subjects. We also believe the BME graduate should possess a solid background in biology and physiology, and

develop an appreciation for the complexity of living systems. By combining this background with both breadth and depth in biomedical engineering topics, our biomedical engineering graduates will be prepared for work in industry or for entrance into medical school or graduate school.

Aspiration

The Biomedical Engineering Department of The City College of The City University of New York aspires to provide exciting educational programs of superior quality at the undergraduate and graduate levels. We want to inspire our students, faculty and staff and nurture their dreams.

Mission

We strive to establish an enduring national urban model for Biomedical Engineering programs and a legacy of excellence in public higher education for future generations of students and faculty.

Values

This Department subscribes completely to the mission and purpose of the City College of New York, especially its commitment to making a superior education available to the most diverse possible group of students. Our Department believes in, and thus teaches, directly and by example, mutual respect and caring for each of its students, faculty and staff.

Educational Objectives

Our objectives are to prepare graduates:

1. For productive employment in biomedical and health related industry.
2. To perform successfully in graduate school, medical school, or professional programs.
3. Who will ethically and responsibly apply their engineering talents for the benefit of society, demonstrating an integrated, multidisciplinary approach to problem solving.
4. Who will continue to develop technical knowledge, awareness, and leadership skills that will allow them to address domestic or global problems in human health.

Program Outcomes

Graduates of the CCNY BME undergraduate program are expected to demonstrate:

1. an understanding of biology and physiology along with the capability to apply advanced mathematics (including differential equations and statistics), science, and engineering to solve the problems at the interface of engineering and biology
2. an ability to design and conduct experiments, as well as to make measurements on, analyze and interpret data from living and non-living systems
3. an ability to design a biomedical engineering system, component, or process to meet desired needs within realistic constraints such as economic, environmental, ethical, health and safety, manufacturability, and sustainability, and addressing the problems associated with the interaction between living and non-living materials and systems
4. an ability to function on multidisciplinary teams
5. an ability to identify, formulate, and solve biomedical engineering problems
6. an understanding of professional and ethical responsibility
7. an ability to communicate effectively
8. the broad education necessary to understand the impact of biomedical engineering solutions in a global, economic, environmental, and societal context
9. a recognition of the need for, and an ability to engage in life-long learning
10. a knowledge of contemporary biomedical engineering issues
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Advisement

Students majoring in Biomedical Engineering are advised by the administrative director of Biomedical Engineering, and by an assigned faculty member in the department.

Transfer Credits

The Biomedical Engineering Department grants transfer credits for legitimate biomedical engineering courses having engineering/science content that matches City College courses. Note that only courses with grades of C or better are accepted for transfer credits.

Accreditation

The B.E. (BME) program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

Biomedical Engineering, Bachelor of Engineering (B.E.)**Requirements for Majors**

Biomedical Engineering majors must complete the following:

Math and Science Requirements

MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
BIO 10100	Biological Foundations I	4
BIO 22900	Cell and Molecular Biology	4
BIO 32100	Physiological Processes	3
PHYS 20700	University Physics I	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 21000	Applied Chemistry for Biomedical Engineers	3

Subtotal: 46

MATH 20100, MATH 20200, MATH 20300, MATH 39100, MATH 39200, PHYS 20700-20800, CHEM 10301-10401: Minimum grade of "C" required.

English and General Education Requirements**Required Courses**

ENGL 11000	Freshman Composition	3
ENGL 21007	Writing for Engineering	3

General Education Electives (15 credits)

Refer to the Grove School of Engineering section (p. 251) for details.

Subtotal: 21**General Engineering Required Courses**

ENGR 10100	Engineering Design	1
CHE 22900	Chemical Engineering Thermodynamics I	3
CHE 34100	Transport Phenomena I	3
ME 24600	Engineering Mechanics I (Statics and Particle Kinematics)	3
ME 33000	Mechanics of Materials	3

Subtotal: 13**Biomedical Engineering****Required Courses**

BME 10100	Introduction to Biomedical Engineering	1
BME 20500	Bioelectrical Circuits with Laboratory	4
BME 22000	Biostatistics and Research Methods	3
BME 30500	Dynamical Systems and Modeling	3

BME 31000	Experimental Methods in BME	3
BME 40500	Biomedical Transducers and Instrumentation	4
BME 45000	Biomedical Engineering Senior Design I	3
BME 46000	Biomedical Engineering Senior Design II	3
BME 50100	Cell and Tissue Mechanics	3
BME 50200	Cell and Tissue Transport	3
BME 50300	Cell and Tissue-Biomaterial Interactions	3
BME 50500	Image and Signal Processing in Biomedicine	3
ENGR 30000	Social, Economic and Cultural Impact of Biomedical Technology	3

Subtotal: 9**Engineering Electives**

Students must complete at least 3 credits of engineering electives from the following: (3 credits)

BME 51000	Microfluidic Devices in Microtechnology	3
BME 59000	Biomedical Engineering Independent Study	Variable cr.
BME 13000	Neural Engineering and Applied Bioelectricity	3
BME 14200	Organ Transport and Pharmacokinetics	3
BME 15000	Medical Imaging and Image Processing	3
BME 15100	Biomedical Signal Processing	3
CSC 10200	Introduction for Computing	3
CHE 33000	Chemical Engineering Thermodynamics II	3
CHE 34200	Transport Phenomena II	3
EE 33000	Electromagnetics	3
ENGR 14200	Continuum Mechanics	3
ENGR 11100	Introduction to Engineering Analysis	3
ME 14500	Computer-Aided Drafting	2
ME 24700	Engineering Mechanics II (Kinematics and Dynamics of Rigid Bodies)	3
ME 32200	Computer Methods in Engineering	3
ME 37100	Computer-Aided Design	3

Technical Electives

Students must complete at least 6 credits of Technical Electives*: (6-8 credits)

*Pre-med students must take the Organic Chemistry sequence (CHEM 26100, CHEM 26200, CHEM 26300) of the Technical Electives. This will increase the pre-med total credits by 2.

BIO 10200	Biological Foundations II	4
BIO 20600	Introduction to Genetics	4
BIO 35000	Advanced Microbiology	4
BIO 35400	Introduction to Neurobiology	3
BIO 37500	Developmental Biology	3
BIO 41000	Cell Development and Cellular Senescence	3
BIO 42000	Virology	3
BIO 42500	Cancer Biology	3
BIO 48300	Laboratory in Biotechnology	5
BME 50400	Cell and Tissue Engineering	3
BME 52000	Practical Tools for Medical Device	3

BME G6000	Design Advanced Biomaterials	3	Methods General Education course	3	
BME 17000	Laboratory in Cellular and Molecular Engineering	3			
BME 18000	Bone Physiology and Biomechanics	3			
BME 19000	Skeletal Soft Tissue Physiology and Biomechanics	3			
BME 19300	Scientific Ethics	1			
BME 19500	Entrepreneurship and Financial Economics	2			
CHE 49808	Nanomaterials	3			
CHE 51200	Pharmaceutical Applications of Chemical Engineering	3			
CHEM 24300	Quantitative Analysis	4			
CHEM 26100	Organic Chemistry I	3			
CHEM 26200	Organic Chemistry Laboratory I	2			
CHEM 26300	Organic Chemistry II	3			
CHEM 33000	Physical Chemistry I	3			
CHEM 33200	Physical Chemistry II	3			
CHEM 45902	Intr Biochemistry	3			
CSC 10400	Discrete Mathematical Structures	4			
MATH 32800	Methods of Numerical Analysis	3			
MATH 37500	Elements of Probability Theory	4			
MATH 37600	Mathematical Statistics	4			
MATH 37700	Applied Statistics and Probability	3			
MATH 39500	Complex Variables for Scientists and Engineers	4			
PHYS 31500	Medical Physics	3			
PHYS 32100	Modern Physics for Engineers	3			
PHYS 32300	Quantum Mechanics for Engineers	3			
PHYS 42200	Biophysics	3			
SCI 28000	Bioinfo & Biomol Sys ANY course from listed Engineering Electives	3			
Subtotal: 128-130					
Additional Requirements for Graduation					
Apply for graduation during registration for the last semester. Minimum GPA of 2.00. Minimum QPA of zero. Residency Requirement: 30 credits of 30000-level or higher Biomedical Engineering courses.					
Recommended Sequence of Courses					
First Semester (18 credits)					
MATH 20100	Calculus I	3			
ENGL 11000	Freshman Composition	3			
CHEM 10301	General Chemistry I	4			
BIO 10100	Biological Foundations I	4			
ENGR 10100	Engineering Design General Education course	1 3			
Second Semester (18 credits)					
MATH 20200	Calculus II	3			
CHEM 10401	General Chemistry II	4			
PHYS 20700					
BME 10100	Introduction to Biomedical Engineering	1			
ENGL 21007	Writing for Engineering General Education course	3 3			
Third Semester (17 credits)					
MATH 20300	Calculus III	4			
CHEM 21000	Applied Chemistry for Biomedical Engineers	3			
PHYS 20800					
BME 22000	Biostatistics and Research	3			
			Fourth Semester (16 credits)		
			MATH 39100	Methods of Differential Equations	3
			CHE 22900	Chemical Engineering Thermodynamics I	3
			ME 24600	Engineering Mechanics I (Statics and Particle Kinematics)	3
			BME 20500	Bioelectrical Circuits with Laboratory	4
				One General Education course, 20000 or higher	3
			Fifth Semester (15 credits)		
			MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
			CHE 34100	Transport Phenomena I	3
			BME 30500	Dynamical Systems and Modeling	3
			BIO 32100	Physiological Processes	3
			ME 33000	Mechanics of Materials	3
			Sixth Semester (17 credits)		
			BME 31000	Experimental Methods in BME	3
			BME 40500	Biomedical Transducers and Instrumentation	4
			BIO 22900	Cell and Molecular Biology	4
			BME 50100	Cell and Tissue Mechanics	3
			BME 50300	Cell and Tissue-Biomaterial Interactions	3
			Seventh Semester (15 credits)		
				Technical or Engineering Elective	3
			BME 50200	Cell and Tissue Transport	3
			BME 50500	Image and Signal Processing in Biomedicine	3
			BME 45000	Biomedical Engineering Senior Design I	3
			ENGR 30000	Social, Economic and Cultural Impact of Biomedical Technology	3
			Eighth Semester (12-14 credits)		
				Technical or Engineering Elective	3
				Technical Elective	3-5
			BME 46000	Biomedical Engineering Senior Design II	3
				One General Education course, 20000 or higher	3
Faculty					
Gilda Barabino, Professor and Dean, Grove School of Engineering <i>B.S. (Chemistry), Xavier Univ.; Ph.D. (ChE), Rice Univ.</i>					
Marom Bikson, Professor <i>B.S. (BME), Johns Hopkins Univ.; Ph.D. (BME), Case Western Reserve Univ.</i>					
Luis Cardoso, Professor <i>B.E. (BME), National Polytechnic Institute (Mexico); M.S. (BME), Univ. of Paris, Ph.D. (BME)</i>					
Jacek P. Dmochowski, Assistant Professor <i>B.E. (EE), Carleton University (Canada), M.A.Sc.; Ph.D. (Telecommunications), Institute National de la Recherche Scientifique (Canada)</i>					
Susannah P. Fritton, Professor <i>B.S. (BME), Tulane Univ., M.S., Ph.D. (BME)</i>					

Bingmei Fu, Professor
B.S. (Mechanics), Univ. of Science and Technology (China), M.Eng.; Ph.D. (ME), CUNY

Steven Nicoll, Associate Professor
B.S. (BME) Univ of Penn.; Ph.D. (BME) Univ. of California (Berkeley & San Francisco)

Lucas Parra, Herbert G. Kayser Professor
B.S. (Physics), Ludwig Maximilian Univ. (Germany), Ph.D. (Physics)

Mitchell B. Schaffler, CUNY & Wallace Coulter Distinguished Professor and Chair
*B.S. Stony Brook Univ.; Ph.D. (Orthopaedics), West Virginia Univ.
 B.S. (Biological Sciences) Stony Brook Univ.; Ph.D. (Orthopaedics), West Virginia Univ.*

John M. Tarbell, CUNY & Wallace Coulter Distinguished Professor
B.S. (ChE), Rutgers Univ.; Ph.D. (ChE) Univ. of Delaware

Maribel Vazquez, Associate Professor
B.S. (ME), Cornell Univ.; M.S. (ME), Massachusetts Inst. of Tech., Sc.D. (ME)

Sihong Wang, Associate Professor
B.S. (BME), Shanghai (China); Ph.D. (BME), Univ. of Texas (Austin)

Professors Emeriti

Stephen C. Cowin
 Sheldon Weinbaum

Department of Chemical Engineering

Professor Ilona Kretzschmar, Chair • Department Office: ST 323 • Tel: 212-650-6769

General Information

The City College offers the following undergraduate degree in Chemical Engineering:

B.E. (Ch.E.) (p. 262)

Programs and Objectives

Chemical engineering is a field of broad scope, encompassing many activities of immense benefit to society. It is also a field that is currently developing rapidly in many new challenging and exciting areas such as biotechnology, electronics, materials, nanotechnology, biomedical engineering, materials discovery and development, and energy sustainability to name just a few. The pace of global competition is rapidly changing the ways in which chemical engineers must carry out their traditional tasks of process research, development, design, and plant operations.

What sets chemical engineering apart from the other engineering professions is the key role played by chemistry. Chemical engineers use chemistry to transform less desirable forms of matter into those that are more desirable. Examples are transforming natural gas into ammonia and this into fertilizer and many other products or converting a residual oil in a refinery into gasoline, kerosene, and heating oil. Many of the products that we use today such as plastics, synthetic fibers, medicines, soaps, and paints are the result of these transformations. Biochemical transformations are becoming increasingly important in the production of a wide range of useful products such as antibiotics.

Transformations by chemical or biochemical reaction are not the whole story. Products must be purified and unwanted byproducts separated for safe disposal. So separation technology is also an important aspect of chemical engineering. And both reaction systems and separations must be combined into processes in order to carry out the overall goal of converting feed materials into desirable products. This will require

additional operations such as mixing, heat transfer, and materials transfer. To accomplish this chemical engineers must have a strong background in basic science and mathematics; a thorough mastery of the relevant engineering science such as thermodynamics, heat and mass transfer, materials science, and reaction kinetics; as well as engineering economics, process safety, and process design.

A degree in chemical engineering prepares one to pursue any number of career paths. These include process research and development, product discovery and development, plant design and operation, sales and customer support, and for those so inclined, management. Chemical engineering also prepares the graduate for many other career paths such as medicine, biomedical engineering, law, government, and environmental protection.

Program Educational Objectives

City College Chemical Engineering graduates will:

1. Successfully perform in the chemical engineering profession as design, process, and product development engineers.
2. Have the knowledge and motivation to pursue post-baccalaureate degrees in engineering and related fields.
3. Have the ability to apply critical thinking to real-world problems.
4. Demonstrate creativity and innovation in chemical engineering practice to enhance their advancement in their chosen field.

Program Outcomes

We expect that our students at the undergraduate level will have:

1. an ability to apply knowledge of mathematics, science and engineering;
2. an ability to design and conduct experiments, as well as to analyze and interpret data;
3. an ability to design a system, component, or a process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
4. an ability to function on multidisciplinary teams;
5. an ability to identify, formulate, and solve engineering problems;
6. an understanding of professional and ethical responsibility;
7. an ability to communicate effectively;
8. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
9. a recognition of the need for, and an ability to engage in, life-long learning;
10. a knowledge of contemporary issues;
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Accreditation

The B.E. (Ch.E.) program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology.

Advisement

All full-time faculty serve as undergraduate advisors. The department also maintains a permanent staff member with responsibility to facilitate the advisement process.

Chemical Engineering, Bachelor of Engineering (B.E.)

Requirements for Majors

All Chemical Engineering majors are required to take the following courses:

Math and Science Requirements

CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CHEM 24300	Quantitative Analysis	4
CHEM 26100	Organic Chemistry I	3

CHEM 26200	Organic Chemistry Laboratory I	2
CHEM 26300	Organic Chemistry II	3
CHEM 33200	Physical Chemistry II	3
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
PHYS 20700	University Physics I	4
Subtotal: 47		

*CHEM 10301-10401, CHEM 26100, CHEM 26300, MATH 20100, MATH 20200, MATH 20300, MATH 39100, PHYS 20700-20800: *Minimum grade of "C" required.*

English and General Education Requirements

Refer to the Grove School of Engineering section (p. 251) for details.

Subtotal: 24

Engineering Requirements

MATH 37500	Elements of Probability Theory OR	4
EE 31100	Probability and Statistics	3
CHE 22800	Introduction to Chemical Engineering Principles and Practices	5
CHE 22900	Chemical Engineering Thermodynamics I	3
CHE 31000	Introduction to Materials Science	3
CHE 33000	Chemical Engineering Thermodynamics II	3
CHE 34100	Transport Phenomena I	3
CHE 34200	Transport Phenomena II	3
CHE 34500	Separations Operations	3
CHE 34600	Transport Operations	4
CHE 43200	Chemical Reaction Engineering	3
CHE 46200	Unit Operations and Process Control Laboratory II	2
CHE 47900	Process Control	3
CHE 49500	Techniques of Chemical Engineering Design	3
CHE 49600	Chemical Engineering Design Project	3
Subtotal: 44		

MATH 37500, EE 31100: Statistics Elective

Approved Technical Electives

Must include at least 6 credits of engineering courses (CHE, ENGR, or another branch of engineering). Any Math, Science, or Engineering course that is level 30000 or higher will be accepted as a technical elective. In addition ENGR 27600 (Engineering Economics) and SCI 28000 (Bioinformatics & Biomolecular Systems) will be accepted.

Subtotal: 15

Subtotal: 130

Additional Requirements for Graduation

Refer to the Grove School of Engineering section (p. 253) for details.

Recommended Sequence of Courses

First Semester (16 credits)

MATH 20100	Calculus I	3
CHEM 10301	General Chemistry I	4
ENGL 11000	Freshman Composition	3
	Two General Education courses	6

Second Semester (17 credits)

MATH 20200	Calculus II	3
PHYS 20700		
CHEM 10401	General Chemistry II	4
	Two General Education courses	6

Third Semester (16 credits)

MATH 20300	Calculus III	4
PHYS 20800		
CHEM 26100	Organic Chemistry I	3
CHE 22800	Introduction to Chemical Engineering Principles and Practices	5

Fourth Semester (18 credits)

MATH 39100	Methods of Differential Equations	3
CHEM 26200	Organic Chemistry Laboratory I	2
CHEM 26300	Organic Chemistry II	3
CHEM 24300	Quantitative Analysis	4
CHE 22900	Chemical Engineering Thermodynamics I	3
	One General Education course, 20000 or higher	3

Fifth Semester (18 credits)

MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
	One Technical Elective	3
CHE 34100	Transport Phenomena I	3
CHE 33000	Chemical Engineering Thermodynamics II	3

MATH 37500	Elements of Probability Theory OR	4
EE 31100	Probability and Statistics	3

ENGL 21007	Writing for Engineering	3
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MATH 37500, EE 31100: Statistics elective

Sixth Semester (16 credits)

CHE 31000	Introduction to Materials Science	3
CHE 34200	Transport Phenomena II	3
CHE 34500	Separations Operations	3
CHE 34600	Transport Operations	4
CHEM 33200	Physical Chemistry II	3

Seventh Semester (14 credits)

CHE 43200	Chemical Reaction Engineering	3
CHE 47900	Process Control	3
CHE 49500	Techniques of Chemical Engineering Design	3
CHE 46200	Unit Operations and Process Control Laboratory II	2
	One Technical Elective	3

Eighth Semester (15 credits)

	One General Education course, 20000 or higher	3
CHE 49600	Chemical Engineering Design Project	3
	Three Technical electives	9

Faculty

Sanjoy Banerjee, Distinguished Professor
*B.S. (Ch.E.), Indian Institute of Technology; Ph.D., (Ch.E.) University of
Waterloo (Canada)*

Elizabeth J. Biddinger, Assistant Professor
B.S. (Ch.E.), Ohio University; Ph.D. (Ch.E.), Ohio State University

Marco J. Castaldi, Associate Professor
B.S. (Ch.E.), Manhattan College; Ph.D. (Ch.E.), UCLA

Xi Chen, Assistant Professor
B.S. (M.E.), Tsinghua University (China); Ph.D. (M.E.), Stevens Institute of Technology

Alexander Couzis, Herbert G. Kayser Professor
B.S. (Ch.E.), National Technical Univ. (Greece); M.S. (Ch.E.) Univ. of Michigan, Ph.D. (Ch.E.)

M. Lane Gilchrist, Jr., Assistant Professor
B.Ch.E., Louisiana State Univ.; Ph.D., Univ. of California (Davis)

Ilona Kretzschmar, Professor and Chair
Diploma (Chemistry), Technical Univ. of Berlin (Germany); Sc.D. (Chemistry)

Charles Maldarelli, Professor
B.S. (Ch.E.), Columbia Univ., M.S. (Ch.E.), D.Eng.Sc.(Ch.E.)

Robert J. Messinger, Assistant Professor
B.S. (Ch.E.), Ohio State University; Ph.D. (Ch.E.), Univ. of California (Santa Barbara)

Jeffrey F. Morris, Professor
B.Ch.E., Georgia Institute of Technology; M.S., California Institute of Technology, Ph.D.

Vincent O. Pauchard, Associate Professor
B.S. (Mat. Sci.), INSA de Lyon (France); M.S. (Mat. Sci.), Ph.D. (Mat. Sci.), Ecole Centrale de Lyon (France)

David S. Rumschitski, Professor
B.S. (Math/Ch.E.), Cooper Union; M.S. (Ch.E.), Univ. of California (Berkeley), Ph.D. (Ch.E.)

Carol A. Steiner, Professor
S.B. (Chem.), M.I.T.; M.S.E. (Chem./Biochem. Engr.), Univ. of Pennsylvania, Ph.D. (Ch.E.)

Gabriel Tardos, Professor
Dipl. Eng., Polytech. Bucharest, Roumania; M.Sc. (M.E.), Technion, Israel, D.Sc.

Raymond S. Tu, Associate Professor
B.S., (Ch.E.), University of Florida; Ph.D. (Ch.E.), Univ. of California (Santa Barbara)

Rosemarie Wesson, Professor & Associate Dean for Research
B.S. (Ch.E.), M.I.T.; M.S. (Ch.E.), Univ. of Michigan, Ph.D. (Ch.E.)

Professors Emeriti

Andreas Acrivos, Albert Einstein Professor Emeritus

Morton Dean, Albert Einstein Professor Emeritus

Robert A. Graff

Leslie Issacs

Robert Pfeffer

Irven Rinard

Herbert Weinstein

Department of Civil Engineering

Professor Julio Davalos, Chair • Department Office: ST 119 • Tel: 212-650-8000

General Information

The City College offers the following undergraduate degree in Civil Engineering:

B.E. (C.E.) (p. 265)

Accreditation

The Civil Engineering (C.E.) Bachelor of Engineering (B.E.) program is fully accredited by the Engineering Accreditation Commission (EAC) Accreditation Commission of ABET, <http://www.abet.org>.

Programs and Objectives

Civil engineers design, build, and manage the infrastructure of civilization, which includes buildings, bridges, highways, water supply systems, and other public works. These services are the cornerstone of the discipline, although no longer the limiting scope.

A civil engineering background provides a broad-based education that can be applied to many areas of interest within both the private and public sectors. In addition to the traditional engineering practice involving the design and construction of buildings and bridges using conventional materials, experience in new construction technology has led many civil engineers to obtain employment in areas as varied as the aerospace, computer and biomedical fields. No longer a matter of simply building roadways, transportation engineering now develops systems to move people and products with previously unforeseen efficiency using advanced computer and monitoring technology. Environmental engineering, once limited to the construction and maintenance of water quality and waste management systems, is now an integral part of world-wide efforts to preserve and restore the health and welfare of our air, land and water resources.

Civil engineers start their professional employment in any number of positions at organizations ranging from small consulting firms to large contractors and government agencies. It is not uncommon for civil engineers to begin at the analysis and design level, and achieve in time managerial positions overseeing projects with enormous regional and national economic impact. Alternatively, the civil engineering curriculum enables graduates to pursue careers in other fields such as medicine, law and business administration.

To pursue any of these objectives, the curriculum offers three options: Environmental Engineering/Water Resources; Structural and Construction Engineering; and Transportation Engineering.

Mission

The mission of the Civil Engineering undergraduate program:

Inspired by a tradition of Access and Excellence, the mission of the Civil Engineering undergraduate program is to educate and prepare a diverse body of undergraduate students to be leaders in the Civil Engineering profession, as practicing engineers, engineering managers, researchers or educators. Our graduates will be technically capable and intellectually motivated, and will possess the communications skills and the understanding of economic, societal and environmental impacts needed to address modern civil engineering challenges.

Program Educational Objectives

Program Educational Objectives are broad statements that describe what graduates are expected to attain within a few years of graduation. They are based on the needs of our program's constituencies. Our program educational objectives include:

- Advance in a career as a professional in Civil Engineering or in a related field
- Work effectively as a member of a professional team or as its leader/manager
- Engage in professional development
- Obtain a professional engineering license or another relevant license

Student Outcomes

The Program Educational Objectives listed above are the basis for the following Program Outcomes expected of all graduates receiving the B.E. (C.E.) degree:

1. an ability to apply knowledge of mathematics, science and engineering;
2. an ability to design and conduct experiments, as well as to analyze and interpret data;
3. an ability to design a system, component, or a process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, constructability, and sustainability;
4. an ability to function on multi-disciplinary teams;
5. an ability to identify, formulate, and solve civil engineering problems;
6. an understanding of professional and ethical responsibility;
7. an ability to communicate effectively;
8. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
9. a recognition of the need for, and an ability to engage in life-long learning;
10. a knowledge of contemporary issues;
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Advisement

All full-time faculty serve as undergraduate advisors. In addition the following faculty serves as the transfer credit evaluator:

Professor M. Ghosn

Civil Engineering, Bachelor of Engineering (B.E.)

General Requirements

Students wishing to take Engineering Electives other than those listed below must obtain permission in writing from the department chair and the dean for undergraduate affairs.

Requirements for Majors

All Civil Engineering majors must complete the following:

Math and Science Requirements

CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
CSC 10200	Introduction for Computing	3
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
PHYS 20700	University Physics I	4

CHEM 10301, CHEM 10401, MATH 20100, MATH 20200, MATH 20300, MATH 39100, PHYS 20700-20800: Minimum grade of "C" required.

Choose one of the following: (3 credits)

EAS 32800	Global Environmental Hazards	3
BIO 10100	Biological Foundations I	4
	Other elective (with permission of advisor)	

Subtotal: 38-39

English and General Education Requirements

Refer to the Grove School of Engineering (p. 251) section for details.

Subtotal: 24

Engineering Requirements

One of the following two: (3 credits)

ENGR 20400	Electrical Circuits	3
ENGR 23000	Thermodynamics	3

Take the following:

CE 20900	Structural and Site Plans	3
CE 23100	Statics	3
CE 26400	Civil Engineering Data Analysis	3
CE 31600	Civil Engineering Decision and Systems Analysis	3
CE 32600	Transportation Planning	3
CE 32700	Transportation Systems Engineering	3
CE 33200	Mechanics of Deformable Bodies	4
CE 33500	Computational Methods in Civil Engineering	3
CE 34000	Structural Analysis	3
CE 34500	Soil Mechanics	3
CE 35000	Fluid Mechanics	3
CE 36500	Hydraulic Engineering	3
CE 37200	Environmental Impact Assessment	3
CE 40100	Review of Engineering Fundamentals	1
CE 40500	Civil Engineering Management	3
CE 43500	Dynamics of Civil Engineering Systems	3
CE 44100	Reinforced Concrete	3
CE 47400	Environmental Engineering	3
CE 50900	Senior Design Project	3

Subtotal: 59

CE 23100, CE 35000: Minimum grade of "C" required.

**New Transfer students who have successfully completed Calculus II (MATH 20200) should not take ENGR 10100. They are required to complete an additional CE course.*

Fields of Specialization

Students must select one area of specialization and complete two core courses and two elective courses from the specialization in Environmental and Water Resources, Structural and Construction Engineering, or Transportation Engineering. Complete four courses from the list for the specialization in Multi-disciplinary Civil Engineering.

Environmental Engineering/Water Resources

Specialization Core (6 credits)

CE 56600	Engineering Hydrology	3
	AND	
CE 58300	Air Pollution and Control	3
	OR	
CE 58400	Solid Waste Management	3

Specialization Electives (6 credits)

CE 45100	Environmental Water Resources	3
CE 48200	Water and Wastewater Treatment Design	3
CE 51000	Independent Study	3
CE 57100	Water Quality Analysis	3
CE 58300	Air Pollution and Control	3
CE 58400	Solid Waste Management	3
ENGR 30100	Introduction to Satellite Remote Sensing and Imaging	3
ENGR 59910	Introduction to GIS	3
CHEM 26100	Organic Chemistry I	3

Structural and Construction Engineering**Specialization Core (6 credits)**

CE 44000	Finite Element Analysis of Structures	3
CE 44200	Structural Design	3

Specialization Electives (6 credits)

CE 51000	Independent Study	3
CE 53000	Advanced Strength of Materials	3
CE 54000/CE 32600	Highway Engineering	3
CE 55000	Advanced Reinforced Concrete	3
CE 59000	Foundation Engineering	3
ME 46100	Engineering Materials	4

CE 51000: Departmental approval required.

Transportation Engineering**Specialization Core (6 credits)**

CE 52000	Traffic Engineering	3
CE 54000/CE 32600	Highway Engineering	3

Specialization Electives (6 credits)

CE 50500	Construction Project Management	3
CE 51000	Independent Study	3
CE 52500	Geometric Design of Facilities	3
CE 52600	Rail System Design	3
CE 54100	Highway and Airport Construction	3
CE 54500	Urban Transportation	3
CE 56600	Engineering Hydrology	3
CE 59000	Foundation Engineering	3

CE 51000: Departmental approval required.

Multi-disciplinary Civil Engineering**Choose four of the following courses: (12 credits)**

CE 44000	Finite Element Analysis of Structures	3
CE 44200	Structural Design	3
CE 52000	Traffic Engineering	3
CE 54000/CE 32600	Highway Engineering	3
CE 56600	Engineering Hydrology	3
CE 58300	Air Pollution and Control	3
OR		
CE 58400	Solid Waste Management	3

Subtotal: 12

Subtotal: 134

Additional Requirements for Graduation

Refer to the Grove School of Engineering (p. 253) section for details.

Recommended Sequence of Courses**First Semester (17 or 18 credits)**

MATH 20100	Calculus I	3
CHEM 10301	General Chemistry I	4
ENGL 11000	Freshman Composition	3
ENGR 10100	Engineering Design	1
CSC 10200	Introduction for Computing Science Elective	3
		3 or 4

Second Semester (17 credits)

MATH 20200	Calculus II	3
PHYS 20700		

CHEM 10401	General Chemistry II	4
ENGL 21007	Writing for Engineering	3
	General Education course	3

Third Semester (17 credits)

MATH 20300	Calculus III	4
CE 20900	Structural and Site Plans	3
CE 23100	Statics	3
CE 26400	Civil Engineering Data Analysis	3
PHYS 20800		

Fourth Semester (16 credits)

MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
CE 33200	Mechanics of Deformable Bodies	4
CE 35000	Fluid Mechanics	3
	Engineering Science Elective	3

Fifth Semester (18 credits)

CE 32600	Transportation Planning	3
CE 33500	Computational Methods in Civil Engineering	3
CE 34000	Structural Analysis	3
CE 36500	Hydraulic Engineering	3
CE 37200	Environmental Impact Assessment	3
	General Education course	3

Sixth Semester (18 credits)

CE 32700	Transportation Systems Engineering	3
CE 34500	Soil Mechanics	3
CE 44100	Reinforced Concrete	3
CE 47400	Environmental Engineering	3
	Two General Education courses	6

Seventh Semester (15 credits)

CE 31600	Civil Engineering Decision and Systems Analysis	3
CE 43500	Dynamics of Civil Engineering Systems	3
	Specialization Core course	3
	Specialization Elective course	3
	One General Education course, 20000 or higher	3

Eighth Semester (16 credits)

CE 40100	Review of Engineering Fundamentals	1
CE 40500	Civil Engineering Management	3
CE 50900	Senior Design Project	3
	Specialization Core course	3
	Specialization Elective course	3
	One General Education course, 20000 or higher	3

Faculty

Anil Agrawal, Professor
B.Tech. (C.E.), IIT (India); M.E. (C.E.), Univ. of Tokyo; Ph.D. (C.E.), Univ. of California (Irvine); P.E. (New York)

Mahdieh Allahviranloo, Assistant Professor
B.E. (C.E.), Sharif Univ. of Tech.; M.S. (C.E.), Iran Univ. of Science and Tech.; Ph.D. (C.E.) Univ. of California, Irvine

Lawrence C. Bank, Professor
B.Sc. (C.E.), Technion; M.S. (C.E.), Columbia Univ., Ph.D. (C.E.)

Candace E. Brakewood, Assistant Professor

B.S. (Mech. Eng.), Johns Hopkins; M.S. (Transportation, Technology Policy), MIT; Ph.D. (C.E.) Georgia Tech

Alison Conway, Assistant Professor
B.C.E., Univ. of Delaware; M.S. (C.E.), Univ. of Texas (Austin), Ph.D. (C.E.)

Julio Davalos, Professor and Chair
B.S. (C.E.), Virginia Tech, M.S. (C.E.), Ph.D. (C.E.)

Naresh Devineni, Assistant Professor
B.E. (C.E.), Osmania University, India; M.S. (C.E.); Ph. D. (C.E.), North Carolina State University (Raleigh).

Vasil Diyamandoglu, Assistant Professor
B.S. (C.E.), Bogazici Univ. (Istanbul, Turkey), M.S. (C.E.); Ph.D. (C.E.), Univ. of California (Berkeley)

Balazs Fekete, Assistant Professor
M.S. (C.E.), Tech. Univ. of Budapest; Univ. of New Hampshire, Ph.D. (Earth Sciences)

John Fillos, Professor
B.E. (C.E.), CCNY; M.S. (C.E.), Ph.D. New York Univ. (C.E.), Ph.D.; P.E. (New York)

Michel Ghosn, Professor
B.S. (C.E.), Case Western Reserve Univ., M.S. (C.E.), Ph.D. (C.E.)

Camille Kamga, Assistant Professor
B.S. (C.E.), Univ. of Moncton; M.E. (C.E.), . ; Ph.D. City Univ. of New York, Ph.D. (C.E.)

Reza M. Khanbilvardi, Professor
B.S. (C.E.), Pahlavi Univ. (Iran); M.S., Pennsylvania State Univ., Ph.D.; P.E. (New York, Connecticut)

Nir Krakauer, Associate Professor
B.S.E. (Engr. Physics), Univ. of Michigan (Ann Arbor); M.S. (Geochemistry), California Inst. of Technology; Ph.D. (Geochemistry)

Feng–Bao Lin, Associate Professor
B.S. (C.E.), National Taiwan Univ., M.S. (C.E.); Ph.D., Northwestern Univ.; P.E. (New York, Connecticut)

Robert E. Paaswell, Distinguished Professor
B.E. (C.E.), Columbia Univ., M.S. (C.E.); Ph.D. (C.E.), Rutgers Univ.; P.E. (New York)

Michael Piasecki, Associate Professor
Engr. Diplom. (C.E.), Univ. of Hanover; Ph.D. (C.E.), Univ. of Michigan (Ann Arbor)

Hansong Tang, Associate Professor
B.S. (M.E.) Wuhan Univ., M.S. (C.E.); D.Sc. (Math), Peking Univ.; Ph.D. (C.E.), Georgia Tech.

Charles Vörösmarty, Professor
B.S. (Biological Sciences), Cornell Univ; M.S. (C.E.), Univ. of New Hampshire; Ph.D. (Engineering Systems Design)

Ann E. (Beth) Wittig, Associate Professor
B.S. (Ch.E.), Univ. of California (L.A.); Ph.D. (Chem.E.), Ph.D., Univ. of Texas (Austin); P.E. (New York)

Ardavan Yazdanbakhsh, Assistant Professor
B.S. (C.E.), Azad Univ. (Central Branch); M.S. (C.E.), Univ. of Sharjah; Ph.D. (C.E.), Texas A&M Univ.

Professors Emeriti

J. E. Benveniste

G. Donald Brandt

Carl J. Costantino

Norman C. Jen

Mumtaz Kassir

Claire E. McKnight

Norbert Oppenheim

Gerald Palevsky

George Papoulas

Ming L. Pei

Joseph Pistrang

Eli Plaxe

Morris D. Silberberg

James R. Steven

Computer Engineering Program

(A Joint Program of the Departments of Computer Science and Electrical Engineering)

Professor Roger Dorsinville, Co-Chair • Department Office: ST 602 • Tel: 212-650-7248

Professor Akira Kawaguchi, Co-Chair • Department Office: NA 8/206 • Tel: 212-650-6631

Professor M. Ümit Uyar, Director ST 672 • Tel: 212-650-5632

Dr. Samuel Fenster, Associate Director • ST 617 • Tel: 212-650-6594

General Information

The City College offers the following undergraduate degree in Computer Engineering:

B.E. (Cp.E.) (p. 268)

Overview

Computer engineering is the study of the design, analysis, and application of computer systems. It involves a balanced view of hardware, software, hardware-software tradeoffs, and the basic modeling techniques used to represent the computing process. Computer engineers design computer systems that include a wide range of embedded systems, consumer products, telecommunication systems, parallel processors and many others. Besides design work, computer engineers find many openings in such service fields as financial and information systems, network administration, and many others.

The undergraduate curriculum includes a year of English and six Liberal Arts courses, along with appropriate mathematics and sciences. Topics integrated in the computer engineering curriculum include many of the core subjects in both electrical engineering and computer sciences. Through a variety of elective courses students are then able to pursue special interests in a number of focused areas such as computer architecture, software engineering, digital signal processing, VLSI (very large-scale integrated circuits), networks, image analysis, databases, embedded systems, etc.

Computer Engineering at City College is a discipline jointly administered by the Departments of Computer Science and Electrical Engineering. The faculty of these departments enhance their teaching activities with a number of active research programs in such areas as digital signal processing, computer architecture, computer communications, computer security, pattern recognition, image analysis, software engineering, verification and testing and VLSI. Advanced undergraduate students are encouraged to participate in these research efforts.

Program Educational Objectives

The objectives of the program are that holders of CCNY's Bachelor of Engineering degree in Computer Engineering will, in their careers, assume leadership roles; and contribute to the field of computer engineering and related fields. They will participate in professional societies, maintain current knowledge in the field, and pursue advanced studies; and act ethically and responsibly in professional activities.

Program Outcomes

The Program Educational Objectives above are the basis for the following Program Outcomes expected of all Computer Engineering program graduates upon receipt of the B.E. degree:

1. an ability to apply knowledge of mathematics, science and engineering;
2. an ability to design and conduct experiments, as well as to analyze and interpret data;
3. an ability to design a system, component or a process to meet desired needs; within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
4. an ability to function on multi-disciplinary teams;
5. an ability to identify, formulate and solve engineering problems;
6. an understanding of professional and ethical responsibility;
7. an ability to communicate effectively;
8. the broad education necessary to understand the impact of engineering solutions in global, economic, environmental, and societal and societal context;
9. a recognition of the need for, and an ability to engage in, life-long learning;
10. a knowledge of contemporary issues;
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
12. competence in computational and simulation tools;
13. competence in engineering probability;
14. competence in software engineering; and
15. competence in hardware design.

Computer Engineering, Bachelor of Engineering (B.E.)**Requirements for Majors**

All Computer Engineering majors must complete the following:

Math and Science Requirements

CHEM 10301	General Chemistry I	4
	OR	
CHEM 31606	Gen Chem For Engrs	3
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
PHYS 20700	University Physics I	4
		Subtotal: 27-28

CHEM 10301, CHEM 31606, MATH 20100, MATH 20200, MATH 20300, MATH 39100, MATH 39200, PHYS 20700-20800: Minimum grade of "C" required.

English and General Education Requirements

ENGL 11000	Freshman Composition	3
ENGL 21007	Writing for Engineering	3
	General Education Courses	18
		Subtotal: 24

ENGL 11000: FIQWS 10026 is a combined 4-credit course that satisfies the ENGL 11000 and ENGR 10100 requirements. Approved Courses: Refer to the Grove School of Engineering section (p. 251) for details.

Engineering Requirements

ENGR 10100	Engineering Design	1
ENGR 10300	Computer-Aided Analysis Tools for Engineers	2
ENGR 20400	Electrical Circuits	3

CSC 10300	Introduction to Computing for Majors	3
CSC 10400	Discrete Mathematical Structures	4
CSC 21000	Computers and Assembly Language Programming	3
CSC 21200	Data Structures	3
CSC 22000	Algorithms	3
CSC 22100	Software Design Laboratory	3
CSC 33200	Operating Systems	4
CSC 34200	Computer Organization AND	3
CSC 34300	Computer Systems Design Laboratory	1
EE 20500	Linear Systems Analysis I	3
EE 21000	Switching Systems	3
EE 22100	Electrical Engineering Laboratory I	1
EE 24100	Electronics I	3
EE 30600	Linear Systems Analysis II	3
EE 31100	Probability and Statistics	3
EE 31200	Communication Theory	3
EE 32200	Electrical Engineering Laboratory II	1
EE 33000	Electromagnetics	3
EE 42500	Computer Engineering Laboratory	1
EE 45700	Digital Integrated Circuits	3
		Subtotal: 60

ENGR 10100: FIQWS 10026 is a combined 4-credit course that satisfies the ENGL 11000 and ENGR 10100 requirements.

New transfer students who have successfully completed the equivalent of Calculus II (Math 20200) should not take Engr 10100. Instead, they must take an additional 1 credit advanced laboratory elective course from Computer Science or Electrical Engineering.

Electives

The elective course requirements include 3 credits of Practice/Ethics Issues, 6 credits from one of the two Elective Tracks, and a 3-credit CpE elective.

Practice/Ethics Issues:

One of the following courses: (3 credits)

CSC 37500	Social Issues in Computing	3
ECO 10400	Introduction to Quantitative Economics	3
EE 43800	Management Concepts for Engineers	3
ENGR 27600	Engineering Economics	3
ENGR 30000	Social, Economic and Cultural Impact of Biomedical Technology	3
PHIL 34902	Computer Ethics	3
ECO 10400	Introduction to Quantitative Economics	3

Elective track:

Two courses from the Systems track, or two courses from the Computation & Signal Processing track : (6 credits)

Systems track:

CSC 41200	Computer Networks	3
EE 33300	Introduction to Antennas, Microwaves and Fiber Optics	3
EE 33900	Semiconductor Materials and Devices	3
EE 37100	Linear Feedback Systems	3

EE 45100	Communication Electronics	3
EE 46000	Computer Communication Systems	3
EE 46300	Wireless Communications	3
ENGR 23000	Thermodynamics	3
PHYS 32300	Quantum Mechanics for Engineers	3

Computation and Signal Processing track:

CSC 30100	Numerical Issues in Scientific Programming	3
CSC 47000	Image Processing	3
CSC 47100	Computer Vision	3
CSC 47200	Computer Graphics	3
CSC 47900	Digital Libraries	3
CSC 59944	Neural Computing	3
CSc 11900	Pattern Recognition and Machine Learning	3
EE 45300	Digital Signal Processing	3
EE 47100	Introduction to Digital Image Processing	3
EE 12200	Image Processing	3

CSC 11900, EE 12200: Available to students eligible to take graduate courses

Computer Engineering:

One of the following CSC, EE, or BME courses (3 cr):

CSC 30100	Numerical Issues in Scientific Programming	3
CSC 30400	Introduction to Theoretical Computer Science	3
CSC 32200	Software Engineering	4
CSC 33500	Programming Language Paradigms	3
CSC 33600	Introduction to Database Systems	3
CSC 41200	Computer Networks	3
CSC 42000	Compiler Construction	3
CSC 42200	Computability	3
CSC 42800	Formal Languages and Automata	3
CSC 43000	Distributed Computing	3
CSC 43500	Concurrency in Operating Systems	3
CSC 43800	Real-Time Computing Systems	3
CSC 44000	Computational Methods in Numerical Analysis	3
CSC 44200	Systems Simulation	3
CSC 44600	Mathematical Optimization Techniques	3
CSC 44800	Artificial Intelligence	3
CSC 45000	Combinatorics and Graph Theory	3
CSC 45400	Topics in Computer Architecture	3
CSC 47000	Image Processing	3
CSC 47100	Computer Vision	3
CSC 47200	Computer Graphics	3
CSC 47300	Web Site Design	3
CSC 47900	Digital Libraries	3
CSC 48000	Computer Security	3
CSC 48600	Introduction to Computational Complexity	3
CSC 51001-51004	Independent Study	1-4
EE 33300	Introduction to Antennas, Microwaves and Fiber Optics	3
EE 33900	Semiconductor Materials and Devices	3
EE 34200	Electronics II	3
EE 35700	Electric Power Engineering	3
EE 37100	Linear Feedback Systems	3

EE 44100	Electronic Devices and Semiconductor Materials	3
EE 45100	Communication Electronics	3
EE 45200	Fiber Optic Communications	3
EE 45300	Digital Signal Processing	3
EE 45400	Physical Electronics	3
EE 45600	Elements of Control Theory	3
EE 45800	Introduction to Lasers	3
EE 46000	Computer Communication Systems	3
EE 46200	Photonic Engineering	3
EE 46300	Wireless Communications	3
EE 46400	VLSI Design	3
EE 51000	Independent Study	1 or 3
BME 50500	Image and Signal Processing in Biomedicine	3

CSC 51001-51004, EE 51000: Departmental approval required.

Total Elective Credits 12

Senior Design Course

Choose one of the following sets of courses: (6 credits)

CSC 59866	Senior Project I	3 cr. per semester for two consecutive semesters.
	AND	
CSC 59867	Senior Project II	3 cr. per semester for two consecutive semesters.
	OR	
EE 59868	Senior Design 1 for Computer Engineering	3
	AND	
EE 59869	Senior Design 2 for Computer Engineering	3

Subtotal: 6

Subtotal: 129-130

Additional Requirements for Graduation

These include minimum GPA and QPA; and the Residency Requirement. Refer to the Grove School of Engineering section (p. 253) for details.

Recommended Sequence of Courses

First Semester (17 credits)

MATH 20100	Calculus I	3
CHEM 10301	General Chemistry I	4
CSC 10300	Introduction to Computing for Majors	3
ENGR 10100	Engineering Design	1
ENGL 11000	Freshman Composition	3
	General Education course	3

Second Semester (16 credits)

MATH 20200	Calculus II	3
PHYS 20700		
ENGR 10300	Computer-Aided Analysis Tools for Engineers	2
CSC 10400	Discrete Mathematical Structures	4
ENGL 21007	Writing for Engineering	3

Third Semester (17 credits)

MATH 20300	Calculus III	4
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PHYS 20800			
ENGR 20400	Electrical Circuits		3
CSC 21200	Data Structures		3
EE 21000	Switching Systems		3
Fourth Semester (17 credits)			
MATH 39100	Methods of Differential Equations		3
MATH 39200	Linear Algebra and Vector Analysis for Engineers		3
CSC 22100	Software Design Laboratory		3
EE 20500	Linear Systems Analysis I		3
EE 24100	Electronics I		3
EE 31100	Probability and Statistics		3
Fifth Semester (16 credits)			
CSC 21000	Computers and Assembly Language Programming		3
CSC 22000	Algorithms		3
EE 22100	Electrical Engineering Laboratory I		1
EE 30600	Linear Systems Analysis II		3
EE 31200	Communication Theory		3
EE 33000	Electromagnetics		3
Sixth Semester (15 credits)			
CSC 33200	Operating Systems		4
CSC 34200	Computer Organization		3
CSC 34300	Computer Systems Design Laboratory		1
EE 32200	Electrical Engineering Laboratory II		1
EE 45700	Digital Integrated Circuits		3
	General Education course		3
Seventh Semester (16 credits)			
EE 42500	Computer Engineering Laboratory Senior Design I (in CSc or EE)		1
	Computer Engineering elective		3
	Track elective		3
	Two General Education courses		6
Eighth Semester (15 credits)			
	Track elective		3
	Senior Design II (in CSc or EE)		3
	Practice/Ethics Issues elective		3
	Two Liberal Arts electives, 20000 or higher		6
Total Credits for Major 129–130			

Advisement

Students majoring in Computer Engineering are advised by the administrative director of Computer Engineering, and by an assigned faculty member in either Computer Science or Electrical Engineering.

Faculty

The following faculty of the Computer Science and Electrical Engineering Departments are on the Computer Engineering program faculty:

Computer Science:

Izidor Gertner, Professor
 Irina Gladkova, Associate Professor
 Michael D. Grossberg, Associate Professor
 Akira Kawaguchi, Professor (Co-Chair)
 Zheng Peng, Assistant Professor
 Kaliappa Ravindran, Professor
 Jie Wei, Associate Professor
 George Wolberg, Professor
 Jianting Zhang, Associate Professor
 Zhigang Zhu, Herbert G. Kayser Professor

Electrical Engineering:

Michael Conner, Professor
 Roger Dorsinville, Professor (Co-Chair)
 Ibrahim W. Habib, Professor
 Bruce Kim, Associate Professor
 Myung Jong Lee, Professor
 Truong-Thao Nguyen, Associate Professor
 Norman Scheinberg, Professor
 YingLi Tian, Professor
 M. Ümit Uyar, Professor (Director)
 Jizhong Xiao, Professor
 Bo Yuan, Assistant Professor

Department of Computer Science

Professor Akira Kawaguchi, Chair • Department Office: NA 8/206 •
 Tel: 212-650-6632

General Information

The City College offers the following undergraduate degree in Computer Science:

B.S. (C.Sc.) (p. 271)

Programs and Objectives

Computer Science deals with information: its efficient representation and transformation; its communication and security; its storage, retrieval, analysis and display. This relatively new discipline is concerned with computers and computational processes -- their design, the theory that underlies them, their application, and their interaction with each other, with devices, and with humans.

Computer scientists must acquire expertise in the core areas of the field: theory of computation, algorithms and data structures, programming methodology and languages, communications and security, and computer systems and architecture. In addition to general knowledge in the discipline, computer scientists must achieve proficiency in one or more areas of specialization, such as software engineering, artificial intelligence, computer vision, networking, database systems, computer-human interaction, computer graphics, or numerical and symbolic computation. Computer scientists need as well a solid foundation in mathematics and science, and an understanding of the societal implications of computer technology based on a broad background in the humanities and social sciences.

The field has experienced exceptional growth since its beginning. Opportunities in professional practice, as well as research and teaching, are numerous. The Department of Computer Science, established in 1968, offers a broad curriculum in this branch of knowledge.

Mission

The mission of the department of Computer Science at The City College, in conformity with the mission of the School of Engineering, is:

1. To educate well-rounded and conscientious computer scientists capable of becoming leaders in their profession.
2. To conduct basic and applied research in computer science and engineering.
3. To offer advice, service, and support to industry, government agencies, schools, community groups and professional societies.

Program Educational Objectives

In order to achieve the mission the stakeholders of the Department of Computer Science have established the following Program Educational Objectives:

1. Pursue a successful career in industry or an advanced degree in computer science or a related field.
2. Engage in life-long learning through continuous professional development.
3. Demonstrate leadership in addressing technical and business challenges.

- Adhere to the ethical standards and accept the professional responsibilities expected of practicing professionals.

Program Outcomes

Upon graduation, our students are expected to have:

- An ability to apply knowledge of computing and mathematics appropriate to the discipline.
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- An ability to function effectively on teams to accomplish a common goal.
- An understanding of professional, ethical, legal, security and social issues and responsibilities.
- An ability to communicate effectively with a range of audiences.
- An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- Recognition of the need for and an ability to engage in continuing professional development.
- An ability to use current techniques, skills, and tools necessary for computing practice.
- An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- An ability to apply design and development principles in the construction of software systems of varying complexity.

Computer Science, Bachelor of Science (B.S.)

Requirements for Majors

The satisfactory completion of 126 credits of prescribed and elective courses is required for the Bachelor of Science degree. The work comprises twenty-four English and General Education credits, twenty-five math and science credits, fifty-three credits of required Computer Science courses, twelve credits of Computer Science elective courses, six credits of technical electives, and six credits of free electives.

Math and Science Requirements

MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 34600	Elements of Linear Algebra	3

MATH 20100, MATH 20200, MATH 20300, MATH 34600: Minimum grade of "C" required.

Students are required to take at least twelve credits of science. (12 credits)

These credits must include one of the following year-long sequences:

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
PHYS 20700	University Physics I	4

BIO 10100, BIO 10200, CHEM 10301, CHEM 10401, PHYS 20700-20800: Minimum grade of "C" required.

and at least one additional course in Biology, Chemistry, or Physics. (4 cr.)

Subtotal: 25

English and General Education Requirements

Required Courses

ENGL 11000	Freshman Composition	3
ENGL 21007	Writing for Engineering	3
SPCH 11100	Foundations of Speech	3

Communication

ENGR 27600	Engineering Economics	3
	OR	
ECO 10400	Introduction to Quantitative Economics	3

SPCH 11100: students who are exempted from SPCH 11100 must take another speech course in its place

General Education Courses (12 credits)

Four courses from a list of General Education courses, at least two of which must be at the 200 level or above. Refer to the Grove School of Engineering section (p. 251) for details.

Subtotal: 24

Computer Science Requirements

CSC 10300	Introduction to Computing for Majors	3
CSC 10400	Discrete Mathematical Structures	4
CSC 11300	Programming Language	1
CSC 21100	Fundamentals of Computer Systems	3
CSC 21200	Data Structures	3
CSC 21700	Probability and Statistics for Computer Science	3
CSC 22000	Algorithms	3
CSC 22100	Software Design Laboratory	3
CSC 30100	Numerical Issues in Scientific Programming	3
CSC 30400	Introduction to Theoretical Computer Science	3
CSC 32200	Software Engineering	4
CSC 33200	Operating Systems	4
CSC 33500	Programming Language Paradigms	3
CSC 33600	Introduction to Database Systems	3
CSC 34200	Computer Organization	3
CSC 34300	Computer Systems Design Laboratory	1
CSC 59866	Senior Project I	3 cr. per semester for two consecutive semesters.

CSC 59867	Senior Project II	3 cr. per semester for two consecutive semesters.
		Subtotal: 53

Electives

I. Computer Science Electives: (12 credits)

Take one course in each of three elective groups and then one additional course in one of the three groups.

A. Theory and Applications

CSC 42200	Computability	3
CSC 42800	Formal Languages and Automata	3
CSC 44800	Artificial Intelligence	3
CSC 45000	Combinatorics and Graph Theory	3
CSC 48000	Computer Security	3

CSC 48600	Introduction to Computational Complexity	3
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B. Computational Techniques for Science and Engineering

CSC 44000	Computational Methods in Numerical Analysis	3
CSC 44200	Systems Simulation	3
CSC 44600	Mathematical Optimization Techniques	3
CSC 47000	Image Processing	3
CSC 47100	Computer Vision	3
CSC 47200	Computer Graphics	3
CSC 47900	Digital Libraries	3

C. Computer Systems

CSC 31800	Internet Programming	3
CSC 41200	Computer Networks	3
CSC 42000	Compiler Construction	3
CSC 43000	Distributed Computing	3
CSC 43500	Concurrency in Operating Systems	3
CSC 43800	Real-Time Computing Systems	3
CSC 47300	Web Site Design	3

II. Technical Electives (6 credits)

Technical electives for Computer Science majors may be either Computer Science electives (except CSC 10000 and CSC 31700) or advanced courses in the following areas: Biology, Chemistry, Earth and Atmospheric Sciences (EAS), Mathematics, Physics, and Chemical, Civil, Electrical, and Mechanical Engineering. Within these fields, the following courses are not acceptable:

1. Courses at the 10000 level.
2. Courses that have no prerequisites.
3. "Professional" courses, such as actuarial math.
4. Project and seminar courses.
5. Courses that substantially duplicate material covered in other
6. courses for which credit has been granted.

III. Free Electives (6 credits)

Acceptable free electives are any courses offered by the College except the following:

1. Remedial courses, including pre-calculus math.
2. Courses at a lower level than required courses.
3. Courses that substantially duplicate material covered in other courses for which credit has been granted.
4. Worker education and independent study courses.

Any substitutions require written permission of both the department chair and dean for Undergraduate Affairs. Computer Science majors may use CSC 10000 or CSC 10200 only as a free elective, as long as the course is taken before the semester in which CSC 10300 is taken.

Co-Op Study

Students electing a Co-Op Study option must complete one of the following options, subtracting the Co-op Study credits from the total number of Technical and Free Electives. Students who successfully complete the co-op Option will have this fact marked on their transcripts. The Co-op Program is open to all students in good standing whose GPA is above a threshold approved by the involved faculty and the department and contingent on the student's (1) application to the program in the sophomore year, and (2) having identified a co-op placement with a faculty member's participation and approval. Please see an academic advisor for more information.

Co op 8 Option (Two-Semester Co-op Study)

Semester 1: CSC 59001 + CSC 59002; semester 2: CSC 59003 (co-op completion, total 9 credits)

or

Semester 1: CSC 59001, semester 2: CSC 59002, CSC 59003 (co-op completion, total 9 credits)

or

Semester 1: CSC 59001, semester 2: CSC 59003 (co-op completion, total 6 credits)

Co op 9 Option (One-Semester Co-op Study)

The "co-op semester" allows students good standing to maintain full-time status while participating in an approved internship. No other academic changes are required to the current CS BS. A typical sequence of courses, including the co-op semester, is given in the end of this appendix. This Option provides the flexibility necessary for students to take their co-op experience in geographically distant locations, such as Silicon Valley. It also permits participation in the Co-op program without additional tuition. The Co-op: 9 Option is only applicable for domestic students.

Subtotal: 126

Recommended Sequence of Courses

A four-year path to graduation might be as follows.

First Semester (16 credits)

ENGL 11000	Freshman Composition	3
MATH 20100	Calculus I	3
CSC 10300	Introduction to Computing for Majors	3
SPCH 11100	Foundations of Speech Communication	3
	Science Elective	4

Second Semester (15 credits)

CSC 10400	Discrete Mathematical Structures	4
CSC 11300	Programming Language	1
MATH 20200	Calculus II	3
	Science Elective	4
	General Education course	3

Third Semester (16 credits)

CSC 21100	Fundamentals of Computer Systems	3
CSC 21200	Data Structures	3
CSC 21700	Probability and Statistics for Computer Science	3
MATH 20300	Calculus III	4
ENGL 21007	Writing for Engineering	3

Fourth Semester (15 credits)

CSC 22000	Algorithms	3
CSC 22100	Software Design Laboratory	3
ENGR 27600	Engineering Economics	3
	OR	
ECO 10400	Introduction to Quantitative Economics	3
MATH 34600	Elements of Linear Algebra	3
	General Education course	3

Fifth Semester (17 credits)

CSC 30100	Numerical Issues in Scientific	3
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CSC 30400	Programming Introduction to Theoretical Computer Science	3	Nelly Fazio, Associate Professor <i>Laurea (CSc), Universita di Catania (Italy); M.Sc. (CSc), Ph.D. (CSc) New York University</i>
CSC 32200	Software Engineering	4	Rosario Gennaro, Professor <i>Laurea (CSc), Universita di Catania (Italy); M.S. (CSc), Massachusetts Inst. of Technology, Ph.D. (CSc)</i>
CSC 33500	Programming Language Paradigms Science Elective	3 4	Izidor Gertner, Professor <i>M.S. (E.E.), KPI, Kaunas, Lithuania; Ph.D. (ECE), Technion (Israel)</i>
Sixth Semester (17 credits)			
CSC 33200	Operating Systems	4	Irina Gladkova, Associate Professor <i>B.S. (Mathematics), Donetsk State Univ.; Ph.D. (Mathematics) CUNY</i>
CSC 33600	Introduction to Database Systems	3	Michael D. Grossberg, Associate Professor <i>B.A., Univ. of Penn.; Ph.D., MIT</i>
CSC 34200	Computer Organization	3	Leonid Gurvits, Professor <i>M.S. (Math), Chernivtsi State Univ., USSR; Ph.D. (Math), Gorky State Univ., USSR</i>
CSC 34300	Computer Systems Design Laboratory	1	Akira Kawaguchi, Professor and Chair <i>B.S. (Admin. Engr.), Keio Univ. (Japan), M.S.; M.S. (C.Sc.), Columbia Univ., Ph.D. (C.Sc.)</i>
CSC	CSC Elective	3	Devendra Kumar, Associate Professor <i>B.Tech. (E.E.), Indian Institute of Technology (Kanpur); M.A. (C.Sc.), Univ. of Texas at Austin, Ph.D.</i>
	One General Education course, 20000 or higher	3	Stephen Lucci, Associate Professor <i>B.S. (Math), SUNY (Stony Brook); M.S. (C.Sc.), The City College; Ph.D. (C.Sc.), CUNY</i>
Seventh Semester (15 credits)			
CSC 59866	Senior Project I	3 cr. per semester for two consecutive semesters.	Abbe Mowshowitz, Professor <i>B.S. (Math), Univ. of Chicago; M.S. (Math), Univ. of Michigan, Ph.D. (C.Sc.)</i>
CSC	Two CSC Electives	6	Zheng Peng, Assistant Professor <i>B.S. (C.Sc. Tech.), B.S. (Contr. Sc. Engr.), Zhejiang Univ. (China); M.E. (C. Cs. Engr.), Univ. of Electronic Science and Tech. (China); Ph.D. (C.Sc. Engr.), Univ. of Connecticut</i>
	Technical Elective	3	Kaliappa Ravindran, Professor <i>B.E. (E.E.), Indian Institute of Science, M.E. (C.Sc.); Ph.D. (C.Sc.), Univ. of British Columbia</i>
	One General Education course, 20000 or higher	3	William E. Skeith, Associate Professor <i>B.S. (Math), Pepperdine Univ., BA (CSC); Univ. of California, Los Angeles, MA (Math), Ph.D.</i>
Eighth Semester (15 credits)			
CSC 59867	Senior Project II	3 cr. per semester for two consecutive semesters.	Douglas R. Troeger, Professor <i>A.B. (Phil), Brown Univ., Sc. B. (Chem); M.Sc., Ph.D. (Math), Stevens Inst. of Tech.</i>
CSC	CSC Elective	3	Huy T. Vo, Assistant Professor <i>B.S. (C.Sc.), University of Utah, Ph.D. (C.Sc.)</i>
	Technical Elective	3	Michael Vulis, Associate Professor <i>B.S. (Math), Leningrad State Univ. (Russia); M.S. (C.Sc.), CUNY, Ph.D. (Math)</i>
	2 Free Electives	6	Jie Wei, Professor <i>B.S. (C.Sc.), Univ. of Sci. & Tech. of China (China); M.S. (C.Sc.), Chinese Academy of Sciences (China); Ph.D. (C.Sc.), Simon Fraser Univ. (Canada)</i>

Subtotal: 19

Advisement

All students are assigned a faculty advisor and a general advisor. Students must attend an advisement session with their faculty advisor each semester before registering for the subsequent semester. A list of faculty advisors and office hours can be found in the department office. The general advisor assists students with administrative matters, registration, and academic planning.

Faculty

Peter Brass, Professor
Dipl. Math, Dr. Rer. Nat. (Math), Technical Univ. of Braunschweig

Professors Emeriti

Michael Anshel

Octavio Betancourt

Stefan A. Burr

Stanley Habib

Earth System Science and Environmental Engineering Program

(Interdisciplinary Program of the School of Engineering and the Division of Science)

Professor Marco J. Castaldi, Program Director • ST417 • Tel: 212-650-6679

Professor Kyle McDonald, Associate Director • MR 925 • Tel: 212-650-6984

Dr. Liubov Kreminska, Program Administrator • Program Office: ST-421 • Tel: 212-650-8299

General Information

The City College offers the following undergraduate degree in Earth System Science and Environmental Engineering:

B.E. (p. 275)

Programs and Objectives

Human activity is increasingly perturbing environmental systems. Deterioration of the environment through depletion of natural resources such as air, water and soil results in the destruction of ecosystems and climate change. Environmental issues are emerging as matters of major policy interest in the 21st century. Issues such as emission control, climate change and global warming, resource management, public health, and environmental remediation are already taking center stage in the public policy arena and will continue to do so in the coming decades, driving scientific and engineering research in these cross disciplinary areas. It is now clear that sustainable development will hinge on engineering and science solutions that take into account interactions between human activity and the Earth system. A sustainable planet requires engineers and scientists to understand the impact of their decisions on built and natural systems.

Earth System Science and Environmental Engineering (ESE) is an interdisciplinary degree program through the Grove School of Engineering and the Science Division of CCNY. The program has been established to satisfy the requirements of government and private industry to address 21st century environmental and climate problems. Through carefully selected courses in both Engineering and Science, the ESE curriculum provides a well-rounded foundation in both engineering design and applications and the scientific basis for environmental issues. Flexibility is achieved by requiring each student to focus on a set of electives tailored to an approved specialization within ESE.

Mission

The mission of the Program in Earth System Science and Environmental Engineering at the City College of New York, in conformity with the mission of the School of Engineering, is:

1. To provide students with both a broad multidisciplinary education on interacting environmental systems and a targeted in-depth exposure to specialized and emerging areas.
2. To educate a diverse student body to carry out basic and applied research leading to new ideas, systems and solutions in the environmental engineering, earth systems science and related fields.
3. To offer advice, service, and support to industry, government agencies, schools, community groups and professional societies.
4. To insure that the above is carried out in appropriate and modern facilities that are conducive to learning.

Program Educational Objectives

The faculty and students of the Earth System Science and Environmental Engineering Program have established the following educational objectives:

1. Perform effectively and ethically in a global multicultural environment.
2. Contribute actively to assist decision-makers in the formulation of public policy by participating in professional societies, actively publishing and attending and presenting at local and national conferences and meetings.
3. Function effectively in multi-disciplinary endeavors especially between engineering and the sciences.
4. Provide a foundation for students to be well situated to progress to positions of leadership
5. Apply sound scientific knowledge and engineering principles to real world problems to meet the needs of society.

Student Outcomes

Students receiving a B.E. in Earth System Science and Environmental Engineering are expected to have attained the following set of outcomes:

1. an ability to apply knowledge of mathematics, science, and engineering
2. an ability to design and conduct experiments, as well as to analyze and interpret data
3. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
4. an ability to function on multi-disciplinary teams
5. an ability to identify, formulate, and solve engineering problems
6. an understanding of professional and ethical responsibility
7. an ability to communicate effectively
8. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
9. a recognition of the need for, and an ability to engage in life-long learning
10. a knowledge of contemporary issues
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Transfer Credits

Transfer credits are granted for relevant courses that have content that match City College courses. All cases must be accompanied by documentation at the evaluation session. Such documentation include:

- complete, official transcript;
- complete class notes;
- textbooks used;
- reports written;
- homework;
- professionally executed, detailed engineering drawings if applicable.

Only grades of C or better will be accepted for transfer credits.

Accreditation

The undergraduate program in Earth System Science and Environmental Engineering meets requirements for accreditation by Accreditation Board for Engineering and Technology (ABET) and is accredited in Environmental Engineering.

Curriculum

The driving concept behind the curriculum is to provide students with a rigorous and yet flexible program. At the same time, the program seeks to integrate existing related courses at CCNY into a coherent course of study in Earth System Science and Environmental Engineering.

Earth System Science and Environmental Engineering, Bachelor of Engineering (B.E.)

Requirements for Majors

Math and Science's Requirements

BIO 10100	Biological Foundations I	4
CHEM 10301	General Chemistry I AND	4
CHEM 10401	General Chemistry II	4
CSC 10200	Introduction for Computing	3
EAS 21700	Systems Analysis of the Earth	4
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
PHYS 20700	University Physics I	4
		Subtotal: 43

CHEM 10301, CHEM 10401, MATH 20100, MATH 20200, MATH 20300, MATH 39100, MATH 39200, PHYS 20700, PHYS 20800: Minimum grade of "C" required.

English and General Education Requirements

Refer to the School of Engineering section (p. 251) for details.

Students must take ENGL 21007: Writing for Engineers (3 cr.) and ENGR 27600: Engineering Economics (3 cr.)

ENGL 21007	Writing for Engineering	3
ENGR 27600	Engineering Economics	3
		Subtotal: 24

Major Engineering Requirements

ENGR 10100	Engineering Design	1
ENGR 10610	Introduction to Earth System Science and Engineering	4
ENGR 20800	Computation Methods for ESE	2
ENGR 30100	Introduction to Satellite Remote Sensing and Imaging	3
ENGR 59910	Introduction to GIS	3
ENGR 59869	ESE Design I	2
ENGR 59870	Environmental and Earth System Science and Engineering Design II	3
CE 26400	Civil Engineering Data Analysis	3
CE 36500	Hydraulic Engineering	3
CE 37200	Environmental Impact Assessment	3
CE 47400	Environmental Engineering	3

Restricted Engineering Elective (Select One):

ENGR 20400	Electrical Circuits OR	3
CE 23100	Statics	3

Fluid Mechanics (Select one):

CE 35000	Fluid Mechanics OR	3
ME 35600	Fluid Mechanics OR	3
CHE 34100	Transport Phenomena I	3

Restricted Elective Thermo I (Select one):

CHE 22900	Chemical Engineering Thermodynamics I OR	3
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ENGR 23000	Thermodynamics	3
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Restricted Elective (Select one):

CHE 33000	Chemical Engineering Thermodynamics II OR	3
ME 43000	Thermal Systems Analysis and Design OR	3
CHEM 26100	Organic Chemistry I	3
		Subtotal: 42

Technical Electives (18 credits)

These are to be selected from the list of approved engineering and science courses below. An appropriate sequence of courses will be selected based on student interest and with the approval of the student's faculty advisor.

Engineering Electives

CHE 34200	Transport Phenomena I	3
CE 56600	Engineering Hydrology	3
CE 57100	Water Quality Analysis	3
CE 58300	Air Pollution and Control	3
CE 58400	Solid Waste Management	3
EE 20500	Linear Systems Analysis I	3
EE 31100	Probability and Statistics	3
EE 33000	Electromagnetics	3
EE 35700	Electric Power Engineering	3
EE 42800	Photonics Engineering Laboratory	1
EE 45500	Elements of Power Systems	3
EE 46200	Photonic Engineering	3
EE G6800	Optic Remote Sensing	3
ME 32200	Computer Methods in Engineering	3
ME 43300	Heat Transfer	3
ME 47100	Energy Systems Design	3
ME 53600	Sustainable Energy Conversion Systems	3
ME 54700	Environmental Control	3
ME 55600	Advanced Fluid Mechanics	3
ME 53700	Turbomachinery Design	3
ENGR 55400	Reactor Physics and Engineering	3
ENGR 55500	Thermal Hydraulics	3
ENGR 55600	Nuclear Reactor Design, Operation and Safety	3
ENGR 59920	Bldg Mod&Simul	3
ENGR 59950	Special Topics in Earth System and Environmental Engineering	3
ENGR 41230	The Management of Hazardous Wastes	3
ENGR 5100X	Special Projects in ESE	1-3
ENGR 55680	Special Topics in Remote Sensing	3
ENGR 59803	Industrial Ecology	3

Science Electives

EAS 30800	ESS Modeling/Databases	3
EAS 31003	Independent Study	3
EAS 41700	Satellite Meteorology	3
EAS 30900	Fundamentals of Atmospheric Science	3
EAS 32800	Global Environmental Hazards	3
EAS 33300	Phase I Environmental Site Assessments	3
EAS 33400	Phase II Environmental Site Assessments	3
EAS 34500	Hydrology	3

EAS 36500	Coast and Ocean Processes	3
EAS 41300	Environmental Geochemistry	3
EAS 43900	Mineral/Energy Resources	4
EAS 43000	Sedimentology	3
EAS 48800	Climate Change	3
EAS 56100	Geophysics	3
EAS 44600	Groundwater Hydrology	3
CHEM 24300	Quantitative Analysis	4
CHEM 26100	Organic Chemistry I	3
CHEM 26300	Organic Chemistry II	3
CHEM 27200	Organic Chemistry Laboratory I	3
CHEM 33100	Physical Chemistry Laboratory I	2
CHEM 33200	Physical Chemistry II	3
CHEM 40600	Environmental Chemistry	3
CHEM 40601	Environmental Chemistry Laboratory	2
CHEM 40700	Environmental Organic Chemistry	3
CHEM 43400	Physical Chemistry and Chemical Instrumentation Laboratory II	3
PHYS 32100	Modern Physics for Engineers	3
PHYS 32300	Quantum Mechanics for Engineers	3
PHYS 45200	Optics	3

Electives

1. A minimum of 18 course credits in Restricted and Technical Electives must come from Engineering courses.
2. A minimum of three of the six Technical Electives must be in engineering.
3. All electives must be approved by an ESE Advisor.

Subtotal: 127

Recommended Sequence of Courses**First Semester (14 credits)**

MATH 20100	Calculus I	3
CHEM 10301	General Chemistry I	4
ENGR 10100	Engineering Design	1
ENGL 11000	Freshman Composition	3
	General Education course	3

*MATH 20100: minimum grade of "C" required***Second Semester (18 credits)**

MATH 20200	Calculus II	3
CHEM 10401	General Chemistry II	4
PHYS 20700	University Physics I	4
ENGR 10610	Introduction to Earth System Science and Engineering	4
CSC 10200	Introduction for Computing	3

*MATH 20200: minimum grade of "C" required***Third Semester (17 credits)**

MATH 20300	Calculus III	4
PHYS 20700	University Physics I	4
EAS 21700	Systems Analysis of the Earth	4
ENGL 21007	Writing for Engineering	3

*MATH 20300: minimum grade of "C" required***Fourth Semester (15 credits)**

MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
	Restricted Engineering Elective	3
	Restrictive Elective Thermo	3
CE 26400	Civil Engineering Data Analysis	3

*MATH 39100, MATH 39200: minimum grade of "C" required***Fifth Semester (16 credits)**

ENGR 30100	Introduction to Satellite Remote Sensing and Imaging	3
	Fluid Mechanics option	3
BIO 10100	Biological Foundations I	4
	Technical Elective	3
ENGR 27600	Engineering Economics	3

Sixth Semester (15 credits)

CE 37200	Environmental Impact Assessment	3
ENGR 59910	Introduction to GIS	3
	Restricted Elective	3
	General Education course	3
CE 36500	Hydraulic Engineering	3

Seventh Semester (17 credits)

CE 47400	Environmental Engineering	3
ENGR 59869	ESE Design I	2
	2 Technical Electives	6
	Two General Education courses	6

Eighth Semester (15 credits)

ENGR 59870	Environmental and Earth System Science and Engineering Design II	3
	Three Technical electives	9
	One General Education course, 20000 or higher	3

Advisement

All full-time affiliated faculty may serve as undergraduate advisors. A faculty member in the ESE field of interest or specialization will be assigned to each undergraduate major in the sophomore year and serve as program advisors and transfer credit evaluators. It is recommended that students will follow the newest ESE Curriculum matrix.

Affiliated Faculty

Samir Ahmed

Herbert Kayser Professor, Electrical Engineering

Teresa Badosz

Professor, Chemistry

Sanjoy Banerjee

Distinguished Professor, Chemical Engineering Director of CUNY Energy Institute

Karin Block

Associate Professor, Earth and Atmospheric Sciences

Marco J. Castaldi

Associate Professor, Chemical Engineering

Vasil Diyamandoglu

Associate Professor, Civil Engineering

Balaz M. Fekete

Assistant Professor, Civil Engineering

John Fillos

Professor, Civil Engineering

Alexander Gilerson

Associate Professor, Electrical Engineering

Irina Gladkova

Professor, Computer Science

Jorge Gonzalez

Professor, Mechanical Engineering

Barry Gross

Professor, Electrical Engineering

Michael Grossberg

Associate Professor, Computer Science

Urs Jans
Associate Professor, Chemistry

Patricia Kenyon
Associate Professor, Earth and Atmospheric Sciences

Reza Khanbilvardi
Professor, Civil Engineering
NOAA Chair

Nir Krakauer
Associate Professor, Civil Engineering

Jae Lee
Associate Professor, Chemical Engineering

Z. Johnny Lau
Associate Professor, Earth and Atmospheric Sciences

William Rossow
Distinguished Professor, Electrical Engineering

Hansong Tang
Associate Professor, Civil Engineering

Charles Vörösmarty
Presidential Professor, Civil Engineering

Beth Wittig
Associate Professor, Civil Engineering

Pengfei Zhang
Professor, Earth and Atmospheric Sciences

Department of Electrical Engineering

Professor Roger Dorsinville, Chair • Department Office: ST 602 • Tel: 212-650-7248

General Information

The City College offers the following undergraduate degree in Electrical Engineering:

B.E. (E.E.) (p. 277)

Programs and Objectives

Electrical engineers are involved in the design of components and systems, ranging from the smallest computer chips to large communication systems that span the earth and reach into intergalactic space. The invention of the transistor touched off a technological revolution that continues unabated today, including the development of lasers, fiber optics, microcomputers, satellite communications, control systems, and increasingly sophisticated signal processing algorithms, to name but a few areas.

The undergraduate program in electrical engineering welcomes students who have a solid preparation in mathematics and the sciences. The course of study trains students in analytical procedures to solve specific problems; in laboratory methods to examine complex electrical phenomena; and ultimately in design synthesis to meet specified criteria for systems required to perform specific functions. The program emphasizes mathematical modeling and abstract reasoning because electrical phenomena cannot normally be directly perceived safely by human senses. The program's core curriculum trains students to master the reasoning methods required for electrical engineering. Core areas include linear systems and controls, robotics, photonics, electronics, communications, and computers. Through a variety of elective courses, students are then able to pursue special interests in such areas as photonics, computer engineering, control systems, digital signal processing, networks, telecommunications, microwaves, and robotics.

The faculty of the department enhance their teaching activities with a number of active research programs. Advanced students are encouraged to participate in these research efforts.

Mission

The mission of the Department of Electrical Engineering at The City College, in conformity with the mission of the School of Engineering, is:

1. To educate well-rounded and conscientious electrical engineers capable of becoming leaders in their profession.
2. To carry out basic and applied research leading to new ideas, systems, and devices in electrical engineering and related interdisciplinary areas.
3. To offer advice, service, and support to industry, government agencies, schools, community groups and professional societies.
4. To insure that the above is carried out in appropriate and modern facilities that are conducive to learning.

Program Educational Objectives

Our B.E. program prepares our graduates to achieve the following career and professional accomplishments several years after graduation:

1. Contribute actively to the field and engage in professional development by participating in professional societies, publishing, attending conferences, seeking patents, taking graduate courses, receiving an advanced degree, attending short courses, and participating in webinars.
2. Function effectively in multidisciplinary teams and progress to leadership roles.

Student Outcomes

The Program Educational Objectives are the basis for the following Student Outcomes that all graduates receiving the B.E. (E.E.) degree are expected to achieve at graduation:

1. an ability to apply knowledge of mathematics, science and engineering;
2. an ability to design and conduct experiments, as well as to analyze and interpret data;
3. an ability to design a system, component, or a process to meet desired needs;
4. an ability to function on multi-disciplinary teams;
5. an ability to identify, formulate, and solve real world electrical engineering problems;
6. an understanding of professional and ethical responsibility;
7. an ability to communicate effectively, including the use of information technology tools when appropriate;
8. the broad education necessary to understand the impact of engineering solutions in a global and societal context;
9. a recognition of the need for, and an ability to engage in life-long learning;
10. a knowledge of contemporary issues: an appreciation of environmental, economic and technological issues and their impact on society;
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;

Accreditation

The B.E. (E.E.) program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

Electrical Engineering, Bachelor of Engineering (B.E.)

Requirements for Majors

All Electrical Engineering majors must complete the following:

Math and Science Requirements

Required Courses

CHEM 10301	General Chemistry I	4
CSC 10200	Introduction for Computing	3
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4

MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
PHYS 20700	University Physics I	4
PHYS 32300	Quantum Mechanics for Engineers	3
		Subtotal: 34

CHEM 10301, MATH 20100, MATH 20200, MATH 20300, MATH 39100, MATH 39200, PHYS 20700-20800: Minimum grade of "C" required.

English and Liberal Arts General Education Requirements

Required Courses

ENGL 11000	Freshman Composition	3
ENGL 21007	Writing for Engineering	3

General Education Courses (15 credits)

Refer to the Grove School of Engineering (p. 251) section for details.

Subtotal: 21

Engineering Requirements

Required Courses

ENGR 10100	Engineering Design	1
ENGR 10300	Computer-Aided Analysis Tools for Engineers	2
ENGR 20400	Electrical Circuits	3
ENGR 27600	Engineering Economics	3
EE 20500	Linear Systems Analysis I	3
EE 21000	Switching Systems	3
EE 22100	Electrical Engineering Laboratory I	1
EE 24100	Electronics I	3
EE 25900	Programming for Electrical Engineering	4
EE 30600	Linear Systems Analysis II	3
EE 31100	Probability and Statistics	3
EE 31200	Communication Theory	3
EE 32200	Electrical Engineering Laboratory II	1
EE 33000	Electromagnetics	3
EE 33900	Semiconductor Materials and Devices	3
EE 34400	Digital Computer Systems	3
EE 42500	Computer Engineering Laboratory	1
EE 59866	Seminar Design 1 for Electrical Engineering	3
EE 59867	Seminar Design 2 for Electrical Engineering	3
		Subtotal: 48

**New transfer students who have successfully completed Calculus II (MATH 20200) should not take ENGR 10100. Instead, they are required to complete an additional EE Advanced Laboratory Elective course.*

Electrical Engineering Restricted Electives

Choose two (2) of the following:

EE 33300	Introduction to Antennas, Microwaves and Fiber Optics	3
EE 34200	Electronics II	3
EE 37100	Linear Feedback Systems	3
EE 44100	Electronic Devices and Semiconductor Materials	3
		Subtotal: 6

Electives

All majors must complete the credit requirements from the A and B Electives lists:

A. Lecture Electives

All majors, in consultation with their faculty advisor, must select 18 credits of Lecture Electives, at least 9 credits of which must be in Electrical Engineering courses.

EE 33300	Introduction to Antennas, Microwaves and Fiber Optics	3
EE 34200	Electronics II	3
EE 37100	Linear Feedback Systems	3
EE 35700	Electric Power Engineering	3
EE 43800	Management Concepts for Engineers	3
EE 44100	Electronic Devices and Semiconductor Materials	3
EE 45100	Communication Electronics	3
EE 45200	Fiber Optic Communications	3
EE 45300	Digital Signal Processing	3
EE 45400	Physical Electronics	3
EE 45500	Elements of Power Systems	3
EE 45600	Elements of Control Theory	3
EE 45700	Digital Integrated Circuits	3
EE 45800	Introduction to Lasers	3
EE 45900	Microprocessors	3
EE 46000	Computer Communication Systems	3
EE 46200	Photonic Engineering	3
EE 46300	Wireless Communications	3
EE 46400	VLSI Design	3
EE 47100	Introduction to Digital Image Processing	3
EE 51000	Independent Study	1 or 3
CSC 31800	Internet Programming	3
CSC 34200	Computer Organization	3
MATH 32800	Methods of Numerical Analysis	3
PHYS 45200	Optics	3
ENGR 23000	Thermodynamics	3
ENGR 30100	Introduction to Satellite Remote Sensing and Imaging	3
ENGR 10600	Applied Algebra	3
ENGR 11100	Introduction to Engineering Analysis	3
ENGR 11200	Functions of a Complex Variable	3
CHE 49808	Nanomaterials	3
CHEM 10401	General Chemistry II	4

EE 51000: departmental approval required

MATH 32800: Credit cannot be received for both MATH 32800 and CSC 44000.

ENGR 10600, ENGR 11100, ENGR 11200: For graduate courses, GPA of 2.75 or higher; minimum grade of C is required.

CHEM 10401: minimum grade of C required

B. Advanced Laboratory Electives

Two (2 credits) of the following courses:

Electrical Engineering:

EE 32300	Electrical Engineering Laboratory III	1
EE 42100	Local Area Network Laboratory	1
EE 42200	Analog Communication Laboratory	1
EE 42600	Control Laboratory	1
EE 42800	Photonics Engineering Laboratory	1
		Subtotal: 20

Subtotal: 130

Additional Requirements for Graduation

Refer to the Grove School of Engineering section (p. 253) for details.

Recommended Sequence of Courses

First Semester (17 credits)

MATH 20100	Calculus I	3
CHEM 10301	General Chemistry I	4
ENGL 11000	Freshman Composition	3
ENGR 10100	Engineering Design	1
	Two General Education courses	6

Second Semester (16 credits)

MATH 20200	Calculus II	3
PHYS 20700		
CSC 10200	Introduction for Computing	3
ENGL 21007	Writing for Engineering	3
	General Education course	3

Third Semester (16 credits)

MATH 20300	Calculus III	4
PHYS 20800		
ENGR 20400	Electrical Circuits	3
EE 21000	Switching Systems	3
ENGR 10300	Computer-Aided Analysis Tools for Engineers	2

Fourth Semester (16 credits)

MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
EE 20500	Linear Systems Analysis I	3
EE 22100	Electrical Engineering Laboratory I	1
EE 24100	Electronics I	3
EE 31100	Probability and Statistics	3

Fifth Semester (17 credits)

EE 30600	Linear Systems Analysis II	3
EE 32200	Electrical Engineering Laboratory II	1
EE 33000	Electromagnetics	3
EE	EE Restricted Elective	3
EE 25900	Programming for Electrical Engineering	4
PHYS 32300	Quantum Mechanics for Engineers	3

Sixth Semester (16 credits)

EE 31200	Communication Theory	3
EE 42500	Computer Engineering Laboratory	1
EE 34400	Digital Computer Systems	3
EE 33900	Semiconductor Materials and Devices	3
	Two Lecture Elective courses	6

Seventh Semester (18 credits)

EE	EE Restricted Elective	3
ENGR 27600	Engineering Economics	3
EE	EE Lecture Elective	3
	General Education course	3
	One General Education course, 20000 or higher	3
EE 59866	Seminar Design 1 for Electrical Engineering	3

Eighth Semester (14 credits)

EE 59867	Seminar Design 2 for Electrical Engineering	3
	Three Lecture Elective courses	9
EE	Two EE Advanced Laboratory Elective courses	2

Advisement

All full-time faculty serve as undergraduate advisors. Students attending mostly in the evening should consult the Department bulletin board for special arrangements.

Faculty

Samir Ahmed, Herbert Kayser Professor
B.A., Cambridge Univ., M.A.; Ph.D., Univ. College (UK)

Mohamed A. Ali, Professor
B.S., Azar Univ. (Egypt); M.S., The City College; Ph.D., CUNY

Joseph Barba, Professor
B.E., CCNY, M.E.; Ph.D., CUNY

Michael Conner, Professor
B.E.S., Johns Hopkins Univ.; M.S., Univ. of Maryland, Ph.D.

Roger Dorsinville, Professor and Chair
B.S., Moscow State Univ. (Russia), M.S., Ph.D.

Alexander Gilerson, Associate Professor
B.S., Technical Univ. (Russia), M.S., Ph.D.

Barry M. Gross, Professor
B.A. (Physics/Math), Yeshiva Univ.; M.S., CCNY; Ph.D., CUNY

Ibrahim W. Habib, Professor
B.S., Ain Shams Univ. (Egypt); M.S., Polytechnic Univ. of New York; Ph.D., CUNY

Ping-Pei Ho, Professor
B.S., Tsing-Hun Univ. (Taiwan); M.B.A., Kent State Univ.; Ph.D., CUNY

Bruce Kim, Associate Professor
B.S., Univ. of California, Irvine; M.S., Univ. of Arizona; Ph.D. (ECE), Georgia Inst. of Technology

Myung Jong Lee, Professor
B.S., Seoul National Univ. (Korea), M.S.; Ph.D., Columbia Univ.

Nicholas Madamopoulos, Associate Professor
B.S., Univ. of Patras (Greece); M.S., Univ of Central Florida, Ph.D.

Jamal T. Manassah, Professor
B.S., American Univ. of Beirut (Lebanon); M.A., Columbia Univ., Ph.D.

Ahmed Mohamed, Assistant Professor
B.S, Minia University (Egypt); M.S., Florida International University, Ph.D.

Fred Moshary, Professor
B.S. (Applied Physics), Cornell Univ., M.S. ; Ph.D. (Applied Physics), Columbia Univ.

Truong-Thao Nguyen, Associate Professor
M.Sc., Princeton Univ.; Ph.D., Columbia Univ.

William Rossow, Distinguished Professor
B.A., Hanover College; M.S., Cornell Univ., Ph.D.

Leonid Roytman, Professor
B.S., Moscow Polytechnical (Russia), M.S.; Ph.D., Novosibirsk Polytechnical Inst. (Russia)

Tarek N. Saadawi, Professor
B.Sc., Cairo Univ. (Egypt), M.Sc.; Ph.D., Univ. of Maryland

Norman Scheinberg, Professor
B.E.E., Cooper Union; M.S., M.I.T.; Ph.D., CUNY

Sang Woo Seo, Associate Professor
B.S., Ajou Univ. (South Korea); M.S., Kwangju Inst. of Science and Technology (South Korea); Ph.D., Georgia Inst. of Technology

Aidong Shen, Professor
B.S., Xiamen Univ. (China); Ph.D., Chinese Academy of Sciences, SIOFM.

Kenneth Sobel, Professor
B.E., CCNY; M.E., Rensselaer Polytechnic Inst., Ph.D.

Yi Sun, Associate Professor
B.S., Shanghai Jiao Tong Univ. (China), M.S.; Ph.D., Univ. of Minnesota

YingLi Tian, Professor
B.S., Tian Jin Univ. (China); M.S.; Ph.D., Univ. of Hong Kong

M. Ümit Uyar, Professor
B.S., Istanbul Teknik Univ. (Turkey); M.S., Cornell Univ., Ph.D.

Ardie D. Walser, Professor and Associate Dean
B.E., CCNY, M.E.; Ph.D., CUNY

Jizhong Xiao, Professor
B.S., East China Inst. of Tech. (China); M.S. (EE), Nanyang Tech. Univ. (China); Ph.D. (ECE), Michigan State Univ.

Bo Yuan, Assistant Professor
B.S., M.S., Nanjing University (China). Ph.D., University of Minnesota, Minneapolis

Professors Emeriti

Demos Eitzer

Donald L. Schilling

Fred Thau

Richard Tolimieri

Department of Mechanical Engineering

Professor Feridun Delale, Chair • Department Office: ST 233 • Tel: 212-650-5224

General Information

The City College offers the following undergraduate degree in Mechanical Engineering:
B.E. (M.E.) (p. 280)

Programs and Objectives

Mechanical Engineering is a very broad and versatile profession. Mechanical engineers deal with a wide spectrum of topics ranging from cell mechanics to the design of huge launching pads for space vehicles. Their domain of interest includes energy conversion, space propulsion, transportation vehicles, manufacturing, assembly lines, robotics, computer hardware, pollution control, biomechanics, medical instruments, and heating, ventilating and air conditioning. The diverse and extensive nature of mechanical engineering provides vast opportunities for employment in many challenging and exciting industries.

Our educational program is carefully designed to meet industry's criteria for successful engineers. It stresses fundamentals as well as practice. It focuses on creative thinking and problem-solving skills. It emphasizes written and oral communication, teamwork, design, time management, computer utilization and communication through graphics. Its primary goal is education for career-long learning, giving students the educational tools to enable them to deal with rapidly advancing technologies.

Practice in teamwork is achieved through design projects, computer-aided manufacturing, participation in regional and national contests, independent study and group learning settings. Skills in oral and written communication are gained through reports and presentations of individual and team projects. Modern laboratories provide opportunities for training in measurements and testing. Computers are extensively used in design, simulation, optimization and learning through graphics.

Mission

The mission of the Department of Mechanical Engineering at The City College, in conformity with the mission of the Grove School of Engineering, is:

1. To educate well-rounded and conscientious mechanical engineers of diverse backgrounds capable of becoming leaders in our society.

2. To carry out basic and applied research leading to new scientific and educational ideas, systems, and devices in mechanical engineering and related interdisciplinary areas.
3. To offer advice, service, and support to industry, government agencies, schools, community groups and professional societies.

Program Educational Objectives

Consistent with the mission, the following Undergraduate Program Educational Objectives are established to provide a quality education in mechanical engineering:

1. Our graduates will be on track for successful professional careers.
2. Our graduates have engaged in professional development to enhance their competency and career.
3. Our graduates will pursue advanced studies if they choose to do so.

Student Outcomes

Upon graduation our students are expected to have:

1. an ability to apply knowledge of mathematics, science and engineering;
2. an ability to design and conduct experiments, as well as to analyze and interpret data;
3. an ability to design a system, component, or a process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability;
4. an ability to function on multi-disciplinary teams;
5. an ability to identify, formulate, and solve engineering problems;
6. an understanding of professional and ethical responsibility;
7. an ability to communicate effectively;
8. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
9. a recognition of the need for, and an ability to engage in life-long learning;
10. a knowledge of contemporary issues;
11. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
12. preparation for pursuing advanced degrees;
13. knowledge of specialized and emerging areas in mechanical engineering.

Accreditation

The B.E. (M.E.) program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

Mechanical Engineering, Bachelor of Engineering (B.E.)

Requirements for Majors

Mechanical Engineering majors must complete the following:

Math and Science Requirements

Required Courses

MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 39100	Methods of Differential Equations	3
MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
PHYS 20700	University Physics I	4
CHEM 10301	General Chemistry I	4

MATH 20102, MATH 20202, MATH 20300, MATH 39100, PHYS 20700-20800, CHEM 10301: Minimum grade of "C" required.

Science Electives: (6 credits)

Science Electives require a minimum grade of "C" required.

Two of the following courses:

BIO 10100	Biological Foundations I	4
BIO 32100	Physiological Processes	3
CHEM 10401	General Chemistry II	4
CHEM 26100	Organic Chemistry I	3
CHEM 33000	Physical Chemistry I	3
CSC 10200	Introduction for Computing	3
EAS 21300	Engineering Geol	3
EAS 21700	Systems Analysis of the Earth	4
PHYS 31500	Medical Physics	3
PHYS 32100	Modern Physics for Engineers	3
PHYS 42200	Biophysics	3
PHYS 42300	Biophysics in Applications	3
PHYS 45400	Descriptive Astronomy	3
Subtotal: 34		

PHYS 32100: Can be used as either a Science or a Mechanical Engineering Elective.

BIO 32100, CHEM 26100, CHEM 33000, EAS 21700, PHYS 32100: Second science elective (4th semester) restricted to one of the following four: BIO 32100, CHEM 26100, CHEM 33000, EAS 21700, PHYS 32100.

English and Liberal Arts General Education Requirements

Refer to the Grove School of Engineering section (p. 251) for details.

Subtotal: 24

Engineering Requirements

Required Courses

ENGR 10100	Engineering Design	1
ENGR 20400	Electrical Circuits	3
ENGR 23000	Thermodynamics	3
ME 14500	Computer-Aided Drafting	2
ME 24600	Engineering Mechanics I (Statics and Particle Kinematics)	3
ME 24700	Engineering Mechanics II (Kinematics and Dynamics of Rigid Bodies)	3
ME 31100	Fundamental of Mechatronics	3
ME 32200	Computer Methods in Engineering	3
ME 33000	Mechanics of Materials	3
ME 35600	Fluid Mechanics	3
ME 37100	Computer-Aided Design	3
ME 41100	Systems Modeling, Analysis and Control	4
ME 43000	Thermal Systems Analysis and Design	3
ME 43300	Heat Transfer	3
ME 43600	Aero-Thermal-Fluids Laboratory	1
ME 46100	Engineering Materials	4
ME 46200	Manufacturing Processes and Materials	3
ME 47200	Mechanical Systems Design	3
ME 47300	Senior Design Project 1	3
ME 47400	Senior Design Project 2	3
Subtotal: 60		

New transfer students who have successfully completed Calculus II (MATH 20200 or MATH 20202) should not take ENGR 10100. They are required to complete an additional ME elective course of at least one credit. Minimum grade of "C" required.

Design Electives

Three of the following courses: (9 credits)

ME 44100	Advanced Stress Analysis	3
ME 46600	Dynamics and Control of Aerospace	3

Vehicles

ME 46800	Aircraft and Rocket Propulsion	3
ME 46900	Spacecraft Systems and Spacecraft Design	3
ME 47100	Energy Systems Design	3
ME 51100	Advanced Mechatronics	3
ME 51400	Rotorcraft Aerodynamics	3
ME 51500	Orbital Mechanics	3
ME 53700	Turbomachinery Design	3
ME 53800	Automotive Safety Design and Injury Biomechanics	3
ME 53900	Vehicular Power Systems	3
ME 54200	Introduction to the Theory and Practice of Vibration	3
ME 54600	Robotics and Automation	3
ME 54700	Environmental Control	3
ME 54800	Aerostructures	3
ME 55500	Structural Dynamics and Aeroelasticity	3
ME 55600	Advanced Fluid Mechanics	3
ME 57100	Mechanism Design	3
ME 57200	Aerodynamic Design	3
ENGR 55500	Thermal Hydraulics	3
ENGR 55600	Nuclear Reactor Design, Operation and Safety	3

Mechanical Engineering Electives 3

Additional elective(s) from the following courses or the Design Electives list.

ME 40100	Review of Engineering Fundamentals	1
ME 40200	Project Management	1
ME 52600	Introduction to Finite Element Method	3
ME 53600	Sustainable Energy Conversion Systems	3
ME 56700	Special Topics in Aerospace Engineering	1-3
ME 56800	Special Projects in Aerospace Engineering	1-3
ME 59001-59003	Special Projects	1-3
ME 59101	Special Projects	1
ME 59102	Special Projects	2
ME 59103	Special Projects	3
ME 59500	Teaching/ Research Experiences for Undergraduates	3
ME 59803-59806		
ME 59903-59906		
ME 59901	Product Development, Management and Marketing	3
ENGR 55400	Reactor Physics and Engineering	3
PHYS 32100	Modern Physics for Engineers	3
BME 50100	Cell and Tissue Mechanics	3
BME 50200	Cell and Tissue Transport	3
BME 50300	Cell and Tissue-Biomaterial Interactions	3
CSC 10200	Introduction for Computing	3
CSC 10300	Introduction to Computing for Majors	3

Subtotal: 12

ME 59001-59003, ME 59101-59103, ME 59803-59806, ME 59903-59906:
Departmental approval required.

PHYS 32100: Can be used as either a Science or a Mechanical Engineering Elective.

Subtotal: 129

Additional Requirements for Graduation

Refer to the Grove School of Engineering section (p. 253) for details.

Recommended Sequence of Courses

First Semester (15 credits)

MATH 20100	Calculus I	3
CHEM 10301	General Chemistry I	4
ENGR 10100	Engineering Design	1
ENGL 11000	Freshman Composition	3
ME 14500	Computer-Aided Drafting	2
	General Education course	3

Second Semester (16 credits)

MATH 20200	Calculus II	3
PHYS 20700		
	First Science Elective Course	3
ENGL 21007	Writing for Engineering	3
	General Education course	3

Third Semester (17 credits)

MATH 20300	Calculus III	4
PHYS 20800		
ENGR 20400	Electrical Circuits	3
ME 24600	Engineering Mechanics I (Statics and Particle Kinematics)	3
	General Education course	3

Fourth Semester (18 credits)

MATH 39100	Methods of Differential Equations	3
ENGR 23000	Thermodynamics	3
ME 24700	Engineering Mechanics II (Kinematics and Dynamics of Rigid Bodies)	3
ME 32200	Computer Methods in Engineering	3
ME 33000	Mechanics of Materials	3
	Second Science Elective Course	3

Fifth Semester (16 credits)

MATH 39200	Linear Algebra and Vector Analysis for Engineers	3
ME 31100	Fundamental of Mechatronics	3
ME 35600	Fluid Mechanics	3
ME 46100	Engineering Materials	4
	General Education course	3

Sixth Semester (16 credits)

ME 43000	Thermal Systems Analysis and Design	3
ME 37100	Computer-Aided Design	3
ME 41100	Systems Modeling, Analysis and Control	4
ME 43300	Heat Transfer	3
ME 47200	Mechanical Systems Design	3

Seventh Semester (16 credits)

ME 43600	Aero-Thermal-Fluids Laboratory	1
ME 46200	Manufacturing Processes and Materials	3
ME 46300	Micro/Nano Technology: Mechanics, Materials, and Manufacturing	3

ME 47300	Senior Design Project 1	3
	Design Elective course	3
	One General Education course, 20000 or higher	3

Eighth Semester (15 credits)

ME 47400	Senior Design Project 2	3
	Two Design Elective courses	6
	Mechanical Engineering Elective course	3
	One General Education course, 20000 or higher	3

Advisement

All full-time faculty serve as undergraduate advisors.

Transfer Credits

The Mechanical Engineering Department grants transfer credits for legitimate mechanical engineering courses having engineering/science content that matches City College courses. Courses claiming a design component are not accepted except in certain compelling cases that are supported by convincing documentation at the evaluation session. Such documentation must include (a) a complete, legitimate transcript; (b) complete class notes; (c) textbooks used; (d) reports written; (e) homework; (f) professionally executed, detailed engineering drawings, etc. Note that only courses with grades of C or better are accepted for transfer credits.

Faculty

Yiannis Andreopoulos, Michael Pope Chair and Professor
Diploma in Mech. & Elec. Engr., Nat'l Tech. Univ. of Athens; M.Sc. & D.I.C. (Aeronautics), Imperial College, London, Ph.D. (Aero. Engr.)

Charusheel N. Bapat, Associate Professor
B.E., Poona College of Engineering (India); M.Tech., Indian Inst. Of Technology, Ph.D., Univ. of Manitoba

Gary F. Benenson, Professor
B.S. (Physics), Univ. of Chicago; M.S. (Eng. Sci.), Rensselaer Polytechnic Inst; P.E. (New York)

Zeev Dagan, Professor
B.E. (ME), The City College, M.E. (ME); Ph.D., CUNY

Feridun Delale, Herbert G. Kayser, Professor and Chair
B.S. (CE), Istanbul Tech. Univ., M.S. (CE); Ph.D., Lehigh Univ.

Niell Elvin, Professor
B.S. (CE), University of Witwatersrand (South Africa); M.S. (CE), M.S. (Aeronautics and Astronautics), Ph.D. (CE), M.I.T.

Jing Fan, Assistant Professor
B.E. (Thermal Engr.), Shandong Univ.; M.E. (Engr. Thermophysics), Shandong Univ.; Ph.D. (Thermofluids), Univ. of Hong Kong

Peter Ganatos, Professor
B.E. (ME), The City College, M.E. (ME); Ph.D. (Eng.), CUNY

Jorge Gonzalez-Cruz, Professor
B.S. (ME), Univ. of Puerto Rico, Mayaguez, M.S. (ME); Ph.D., Georgia Institute of Technology

Douglas Jahnke, Substitute Assistant Professor
B.E. (ME), The City College of NY, Ph.D., The City College of NY

Masahiro Kawaji, Professor
B.S. (ChE), Univ. of Toronto; M.S. (ME), Univ. of California, Berkeley, Ph.D.

Taehun Lee, Associate Professor
B.S. (Mech), Seoul National University, M.S. (ME); Ph.D., Univ. of Iowa

Jacqueline Jie Li, Professor
B.S. (Mech), Peking Univ.; M.E. (Applied Mech), Beijing Inst. of Technology; Ph.D. (ME), Rutgers Univ.

Been-Ming Benjamin Liaw, Professor

B.S. (ME), National Tsinghua Univ., M.S. (ME); Ph.D., Univ. of Washington

Rishi Raj, Professor

B.S., Punjab Univ.; B.S., P.F. Univ., Moscow, M.S.; Ph.D., Penn State Univ.

Prathap Ramamurthy, Assistant Professor

B.E. (ME), Univ. of Madras; M.E. (ME), Univ. of Utah; Ph.D., Univ. of Utah

Ali M. Sadegh, Professor

B.S. (ME), Arya-Mehr Univ. of Technology; M.S., (ME), Michigan State, Ph.D.; P.E. (Michigan); Cmfge

Ioana R. Voiculescu, Associate Professor

M.S. (ME), Technical University (Romania), Ph.D. (ME); Ph.D., George Washington Univ.

Charles B. Watkins, Professor

B.S. (ME) Howard Univ.; M.S., Univ. of New York, Ph.D.; P.E. (District of Columbia)

Honghui Yu, Associate Professor

B.S. (Applied Math), Tsinghua Univ., M.E. (Solid Mech.); Ph.D., Princeton Univ.

Professors Emeriti

Antonio Baldo

Latif M. Jiji

Myron Levitsky

The CUNY School of Medicine

Maurizio Trevisan, Dean • HR Suite 107 • Tel: 212-650-5275

Programs and Objectives

The CUNY School of Medicine (CSOM) is built on the legacy of the Sophie Davis Biomedical Education Program which began in 1973. Recently, the New York State Department of Education authorized the City College of New York to grant the MD degree making CSOM the only public medical school in the CUNY System. Its mission remains to serve the under-served and to address the national shortage of primary care physicians in this country. There is an urgent need for more family practitioners, general internists, pediatricians and obstetrician/gynecologists and physician assistants in many communities. The shortage of African-American, His-panic, and others underrepresented medical professionals in inner city areas is particularly acute.

The CSOM offers one of the most unique physician training programs in the nation. It recruits more underrepresented populations into medicine, increases medical services in under-served areas, and increases the availability of primary care physicians and physician assistants.

Additional information on the CUNY School of Medicine's mission, vision, policies, program curricula and more, can be found on the school's web-site at <https://www.cuny.edu/csom>

Military Science - Army Senior Reserve Officers' Training Corps

Professor of Military Science MAJ Nichole R. Drakeford, Director •
Office: MR 016A • Tel: 212-650-6478

Professor Rishi S. Raj, Program Director ROTC at CCNY, Senior Faculty Advisor to CUNY ROTC • Office: MR 016A • Tel: 212-650-6478

Programs and Objectives

Through its Military Science courses the Army Senior Reserve Officers' Training Corps program complements most academic programs. ROTC seeks to educate and equip leaders with to become critical thinkers, communicators and planners. Military Science courses teach leadership as a deliberate, continuous, sequential and progressive process to develop confident, competent, and adaptive leaders with a basic understanding of military decision-making. The ROTC program consists of eight 3-credit courses of Military Science taken in sequence, and a course in military history. The program seeks to commission Cadets as 2nd Lieutenants upon graduation.

Requirements for Admissions

Army ROTC Basic Course sequence (Military Science MSCI 10100, MSCI 10200; MSCI 20100, MSCI 20200, the first 12 credits) are open to all students; no ROTC or military service commitment is required. Military Science courses are taught at CCNY and York College. Students from across CUNY can register through e-permit. Military Science courses are general electives that count towards full-time status with regard to academic load and financial aid.

Army ROTC Advanced Course sequence (Military Science MSCI 30100, MSCI 30200; MSCI 40100, MSCI 40200, totaling 12 credits) are restricted to eligible students who have contracted with the Army as ROTC Cadets. Cadets enrolled in the Advanced Course will have successfully completed the Basic Course or its equivalent. Contracted Cadets are effectively in the U.S. Army Reserve (ROTC) at the rank of Cadet and will commission into the U.S. Army as 2nd Lieutenants upon graduation. Contracted Cadets are required to attend ROTC training events and physical training. Earning a contract is a competitive process. Please see Contracting into ROTC and Army military service obligation below.

Program Requirements

Military Science Basic Course

Open to all CUNY students.

MSCI 10100	Introduction to Leadership I	3
MSCI 10200	Introduction to Leadership II	3
MSCI 20100	Foundations of Leadership I	3
MSCI 20200	Foundations of Leadership II	3

No military commitment is required. Participation in field trips and Leadership Labs are optional and encouraged. Attending Physical Training is encouraged.

Military Science Advanced Course

is restricted to contracted Cadets.

MSCI 30100	Adaptive Team Leadership I	3
MSCI 30200	Adaptive Team Leadership II	3
MSCI 40100	Adaptive Leadership I	3
MSCI 40200	Adaptive Leadership II	3

The minimum standards to be considered for contracting include:

- minimum GPA of 2.0 for non-scholarship Cadet
- minimum GPA of 2.5 for scholarship consideration
- ability to pass the Army Physical Fitness Test within 30 days of contracting
- academic alignment to complete the ROTC program and graduate college at the same time*
- U.S. citizenship

*Students who completed Junior ROTC in high school, have prior military service, or are in the Reserves or National Guard have options to waive some or all of the Basic Course. It is very difficult for a student without military service to join and complete the ROTC program with only two years of college remaining.

Contracting is a competitive process; and meeting only the minimum standards above does not guarantee that a contract will be offered. The Professor of Military Science and Senior Military Instructor will interview and assess all candidates to select those best qualified for service. Please see Contracting into ROTC below.

Contracting into ROTC

All service obligations are 8 years, but are broken down according to what options you choose. There are three forms of service:

1. Active duty (a competitive process). Active duty means you are a full-time soldier. You work 5 days a week (sometimes more, sometimes less). Active duty soldiers live on or near a military base.
2. National Guard or Reserves. This is part-time. One weekend each month and two weeks out of the summer you will assemble with your unit and train. The rest of the time, you are a civilian. The vast majority of American companies have programs to accommodate service requirements of the National Guard and Reserves.
3. Inactive Ready Reserve (IRR). The IRR is the backfill and emergency force for the nation. While you are in the IRR you do not train at all, you do not have to report to anyone, but in the event of a major need for soldiers, you may be recalled to service.

A Cadet who earns Active duty, without a scholarship, will owe 3 years Active and 5 years in the IRR.

A Cadet who earns Active duty with a scholarship will owe 4 years Active and 4 IRR.

A Cadet who chooses Reserve duty will owe 6 years as a Reservist or National Guardsman, and 2 years IRR.

General Education Requirements (Pathways)

In order to graduate, all students are required to complete the following:

1. General Education Requirements
2. Major-field courses
3. Free-elective courses

General Education Requirements (Pathways)

All students entering City College, whether as freshmen or transfers, in Fall 2013 and later must meet Pathways General Education requirements to qualify for a degree. Students who entered prior to Fall 13 may either follow their old General Education requirements (please consult previous bulletins for information about these requirements) or opt-in to Pathways (please consult your academic advisor).

Pathways General Education Requirements at City College consist of:

I. The Common Core (30 credits)

A. Required (Fixed) Common Core (12 credits / 4 courses)

1. English Composition (2 courses)
 - English Composition 1
 - English Composition 2
2. Mathematical and Quantitative Reasoning (1 course)
3. Life and Physical Sciences (1 course)

B. Flexible Common Core (18 credits / 6 courses)

Students will complete at least one course in each of the five Flexible Core areas and an additional sixth course in one of them. Students can complete no more than two courses from any one discipline or interdisciplinary field.

Flexible core areas are:

1. World Cultures and Global Issues
2. U.S. Experience in Its Diversity
3. Creative Expression
4. Individual and Society
5. Scientific World

Once a student has met a Common Core area requirement at one CUNY college, that requirement will be met at any other CUNY college. Transfer students from institutions other than CUNY will have their transcripts evaluated and will be given credit for General Education courses taken at the previous institution as appropriate.

II. Additional City College Requirements (College Option, 12 credits)

These requirements vary depending on the degree being pursued. See section 1.B. (p. 286) for more details. Transfer students need to take 6 to 12 College Option credits depending on how many credits they have at the time of transfer. See section 1.C. (p. 287) for more details.

General Education Requirements (Pathways) for CLAS Students

Bachelor of Arts (B.A.)

I. Common Core

Fixed Core	(12 crs)
Engl Comp 1	3 crs
Engl Comp 2	3 crs

Fixed Core	(12 crs)
Math	3 crs
Life & Physical Sciences	3 crs

Flexible Core (18 crs)

World Cultures & Global Issues: 2 courses:	
i) Literature ii) Global History & Culture	6 crs
U.S. Experience in its Diversity	3 crs
Creative Expression	3 crs
Individual & Society	3 crs
Scientific World	3 crs

II. Additional City College Requirements (12 crs) (College Option)

Foreign Language	9 crs or demonstrated proficiency*
Philosophy	3 crs**

*There are several ways to fulfill the language requirement: four years of the same foreign language in high school; exemption via placement exam; or AP exam/IB equivalencies. Check with your academic advisor and the Department of Classical and Modern Languages and Literatures' section in this bulletin.

**Students are advised to complete this requirement after having completed 30 credits and before having completed 60.

Bachelor of Fine Arts (B.F.A)

I. Common Core

Fixed Core	(12 crs)
Engl Comp 1	3 crs
Engl Comp 2	3 crs
Math	3 crs
Life & Physical Sciences	3 crs

Flexible Core (18 crs)

World Cultures & Global Issues: 2 courses:	
i) Literature ii) Global History & Culture	6 crs
U.S. Experience in its Diversity	3 crs
Creative Expression	3 crs
Individual & Society	3 crs
Scientific World	3 crs

II. Additional City College Requirements (12 crs) (College Option)

Foreign Language	6 crs or demonstrated proficiency *
Philosophy	3 crs**

Foreign Language	6 crs or demonstrated proficiency *
Speech	3 crs or demonstrated proficiency

*There are several ways to fulfill the language requirement: two years of the same foreign language in high school; exemption via placement exam; or AP exam/IB equivalencies. Check with your academic advisor and the Department of Classical and Modern Languages and Literatures' section in this bulletin.

**Students are advised to complete this requirement after having completed 30 credits and before having completed 60.

Bachelor of Science (B.S.)

I. Common Core

Fixed Core	(12 crs)
Engl Comp 1	3 crs
Engl Comp 2	3 crs
Math	3 crs
Life & Physical Sciences	3-4 crs
Flexible Core	(18 crs)

(Science students must take at least one course in each area. They must choose a second course in the flexible core area of their choice)

World Cultures & Global Issues:

Literature & Global History & Culture	3-6 crs
U.S. Experience its Diversity	3-6 crs
Creative Expression	3-6 crs
Individual & Society	3-6 crs
Scientific World	3-8 crs

II. Additional City College Requirements (12 crs)

Foreign Language	6 crs or demonstrated proficiency *
Philosophy	3 crs**
Speech	3 crs or demonstrated proficiency

*There are several ways to fulfill the language requirement. Check with your academic advisor: Two years of the same foreign language in high school; exemption via placement exam; or AP exam/IB equivalencies. Check with your academic advisor and the Department of Classical and Modern Languages and Literatures' section in this bulletin.

**Students are advised to complete this requirement after having completed 30 credits and before having completed 60.

Because many Common Core and College Option courses can simultaneously count toward the satisfaction of major requirements for specific majors, students who have chosen or have a specific major in mind, should consult specific departmental pages of this bulletin and meet with an advisor to see which choices will help them complete their degrees most efficiently.

Students in the Spitzer School of Architecture, the Sophie Davis School of Biomedical Education, the Grove School of Engineering, the School of Education, the Center for Worker Education, The Macaulay Honors College at City College, and the City College Honors Program should consult the relevant pages of this bulletin and see an academic advisor for specific Pathways coursework requirements and recommendations.

General Education Requirements (Pathways) for Transfer Students

All transfer students are required to complete the 30-credit Common Core through coursework at City College, another college, or some combination of these.

In addition, all associate's degree students, including A.A.S. students, who transfer to baccalaureate programs will be required to complete additional General Education coursework at City College as follows:

1. Students who transfer with 30 or fewer total credits from any college will be required to earn 12 credits from City College's additional General Education requirements.
2. Students without an associate's degree who transfer with more than 30 credits from any college will be required to earn 9 credits from City College's additional General Education requirements.
3. Students who transfer with an associate's degree from any college will be required to earn 6 credits from City College's additional General Education requirements called College Option.

The Major

Undergraduate majors are offered throughout the College in approximately fifty fields. They prepare students for a variety of careers as well as for professional and graduate schools. Advisors assist students in making their initial choice of major and, on occasion, in reconsidering chosen fields of study. Every student must complete an approved major. Each department or program sets specific course requirements for its majors, which are outlined in the departmental listings in this Bulletin. Students should consult their advisor periodically for updates on major requirements. While some courses in the major may be completed at other accredited colleges, at least 60% of the major must be taken at City College.

Free Electives

Free electives are those courses taken in addition to required courses to bring the total to the minimum number of credits required for graduation. Students use free electives to take additional work in the major, concentrate in a second field, or to explore particular interests. Students may take almost any course for which they have the prerequisites in the College of Liberal Arts and Science as a free elective, and they are encouraged to take advantage of the wide range of offerings in the professional schools and special programs at the College. The Professional Schools control their own class registrations and students should consult with the advisors in these schools to see if space is available and if they have the prerequisites for the courses in which they are interested. In many cases the focused training of both professional and technical personnel will be too highly specialized for inclusion in a broad liberal arts curriculum. A major department may approve courses in the professional schools for a given student's major program. Only a maximum of 30 credits of free electives from the professional schools will be granted toward the CLAS degree requirements. In the case of B.A. degrees in particular majors, students

may be able to transfer into CLAS fewer than 30 credits in order to fulfill New York State requirements that B.A. degrees must include 90 credits of state-defined liberal arts and science courses.

Speech

Students who have a speech requirement may satisfy it either by passing a Speech Proficiency Test or by passing Speech SPCH 11100 or SPCH 00308. The test, given by appointment, should be taken in the freshman or sophomore year or upon transfer to the College, so that any necessary improvement can be accomplished before graduation.

Pathways Common Core Courses

English Composition (EC)

ART 21000	Writing about Art	3
ENGL 11000	Freshman Composition	3
ENGL 21001	Writing for Humanities and the Arts	3
ENGL 21002	Writing for the Social Sciences	3
ENGL 21003	Writing for the Sciences	3
ENGL 21007	Writing for Engineering	3
ENGL 25000	Introduction to Literary Study	3
FIQWS 10103	Composition for WCGI History & Culture	3
	AND	
FIQWS 10105	Composition for WCGI Literature	3
FIQWS 10108	Composition of Individual & Society	3
FIQWS 10111	Composition for Scientific World	3
FIQWS 10113	Composition for Creative Expression	3
FIQWS 10115	Composition for US Experience	3
FIQWS 10145	Composition for Philosophy	3
IAS 10000	Writing for Interdisciplinary Studies I	4
IAS 10100	Writing for Interdisciplinary Studies II	4
MUS 21000	Writing About Music	3

IAS 10000, IAS 10100: IAS students only

Mathematical and Quantitative Reasoning (MQR)

ECO 20150	Principles of Statistics	4
ECO 29000	Prin Of Stat	4
FQUAN 10050	Freshman Quantitative Analysis	3
MATH 15000	Mathematics for the Contemporary World	3
MATH 17300	Introduction to Probability and Statistics	4
MATH 17700	Introduction to Biostatistics	3
MATH 18000	Quantitative Reasoning	3
MATH 18500	Basic Ideas in Mathematics	3
MATH 19000	College Algebra and Trigonometry	3
MATH 19500	Precalculus	3
MATH 20100	Calculus I	3
MATH 20200	Calculus II	3
MATH 20300	Calculus III	4
MATH 20500	Elements of Calculus	4
MATH 20900	Elements of Calculus and Statistics	4
MED 22309	Fundamentals of Epidemiology	4
PSY 21500	Applied Statistics	4
SOC 23100	Sociological Statistics	3

Life and Physical Sciences (LPS)

BIO 10004	Human Biology	3
BIO 20700	Organismic Biology	4
BIO 22800	Ecology and Evolution	4
CHEM 11000	Exploring Chemistry	3
CHEM 21000	Applied Chemistry for Biomedical Engineers	3
EAS 10400	Perspectives of Global Warming	3
EAS 21300	Engineering Geol	3
MED 10200	Principles of General Chemistry	5
MED 20300	Bio-Organic Chemistry	5
PHYS 21900	Physics for Architecture Students	4

Life and Physical Sciences and Scientific World (LPS, SW) - counts only as one or the other

BIO 10100	Biological Foundations I	4
BIO 10200	Biological Foundations II	4
CHEM 10301	General Chemistry I	4
CHEM 10401	General Chemistry II	4
EAS 10600	Earth Systems Science	4
EAS 22700	Structural Geology	4
IAS 10400	Nature & Human Beings I	4
IAS 10500	Nature and Human Beings II	4
MED 30500	Molecules To Cells 2	3
PHYS 20400		
PHYS 20700		
PHYS 20800		
SCI 12400	Principles of Physical Science	3
SCI 12500	Principles of Life Science	4
SCI 12600	Principles of Environmental Science	3
SCI 10101	The Physical Universe (Honors)	4

IAS 10400, IAS 10500: IAS Students only

SCI 10101: (Honors students only)

Scientific World (SW)

ASTR 30500	Methods in Astronomy	3
BIO 20600	Introduction to Genetics	4
BIO 22900	Cell and Molecular Biology	4
CHEM 24300	Quantitative Analysis	4
CHEM 26100	Organic Chemistry I	3
EAS 10000	The Dynamic Earth	3
EAS 10100	The Atmosphere	3
EAS 10300	Environmental Geology	3
FIQWS 10011	Scientific World	6
MED 10000	Int Drg Abuse Addctn	3
MED 20000	Introduction to Human Genetics	3
MHC 20301	Science & Tech Nyc	3
SCI 10001	Man and Nature: Life (Honors)	4
SCI 10101	The Physical Universe (Honors)	4

MHC 20301, SCI 10101: Honors students only

SCI 10001: Honors

Creative Expression (CE)

AES 23202	Survey of World Architecture I	3
AES 24202	Survey of World Architecture II	3
ART 10000	Introduction to the Visual Arts of the World	3
ART 10001	Introduction to Art for Honors Students	3
ART 29104	Women in World Art	4
FIQWS 10013	Creative Expression	6
MHC 10101	The Arts In Nyc	3
MUS 10100	Introduction to Music	3

MUS 10101	Introduction to Music (Honors)	3
MUS 10200	Introduction to World Music	3
MUS 10201	Introduction to World Music (Honors)	3
MUS 14500	Introduction to Jazz	3
MUS 14501	Introduction to Jazz (Honors)	3
THTR 13100	Introduction to Theatre Arts	3

ART 10001, MUS 10101, MUS 10201, MUS 14501: Honors students only

ART 29104: IAS students only

MHC 10101: Honors

Individual and Society (IS)

ANTH 20100	Cross-Cultural Perspectives	3
ECO 10250	Principles of Microeconomics	3
ECO 19150	Honors Principles	3
FIQWS 10008	Individual and Society	6
IAS 12200		
JWST 28100	The Holocaust	3
MHC 20401	Shaping Future Nyc	3
PSY 10101	Psychology for Freshman Honors Students	3
PSY 10200	Applications of Psychology in the Modern World	3
SOC 10500	Individual, Group and Society: An Introduction to Sociology	3
SOC 10501	Introductory Sociology For Freshman Honors Students	3
SOC 38144	School and American Societies/Sociology of Education	4
WS 10000	Women's/Gender Roles in Contemporary Society	3

IAS 12200: (31292)

ECO 19150, MHC 20401, PSY 10101, SOC 10501: Honors students only

IAS 12200 (31292), SOC 38144: IAS Students only

U.S. Experience in its Diversity (USED)

AES 21200	The Built Environment of New York City	3
Engl 15500	American Literature	3
FIQWS 10015	US Experience	6
HIST 12404		
HIST 24000	The United States: From Its Origins to 1877	3
HIST 24100	The United States: Since 1865	3
MHC 10201	The Peopling Of Nyc	3
PSC 10104	U S Politics & Govt	4
USSO 10100	Development of the U.S. and its People	3
USSO 10101	Development of the U.S. and its People (Honors)	3

MHC 10201, PSC 10101, USSO 10101: Honors students only

PSC 10104: IAS students only

World Cultures and Global Issues (WCGI) - History and Culture

ANTH 10100	General Anthropology	3
ASIA 10100	Asian Cultures and Peoples	3
ASIA 20200	Contemporary Asia	3
ASIA 20500	Contemporary China	3
CLSS 32100	Classical Mythology	3
FIQWS 10003	WCGI History & Culture	6
BLST 10200	African Heritage and the Caribbean-Brazilian Experience	3

WCIV 10100	Prehistory to 1500 A.D.	3
WCIV 10101	World Civilizations (Honors)	3
WCIV 10200	1500 A.D. to the Present	3
WCIV 10201	World Civil II: 1500AD-Present	3
HIST 20400	Early-Modern Europe	3
HIST 20600	Modern Europe	3

WCIV 10101, WCIV 10201: Honors Students Only

World Cultures and Global Issues (WCGI) - Literature

FIQWS 10005	WCGI Literature	6
FREN 28300	The Literature of Contemporary France	3
JWST 11700	Bible as Literature	3
SPAN 12104	Intro Spanish I	4
SPAN 12204	Intro Spanish II	4
SPAN 28100	Masterworks of Spanish Literature I	3
SPAN 28300	Masterworks of Latin American Literature	3
THTR 21100	Theatre History I	3
THTR 21200	Theatre History II	3
THTR 21300	Theatre History III	3
WHUM 10100	World Humanities I	3
WHUM 10101	Literature in the Human Experience (Honors)	3
WHUM 10200	World Humanities II	3
WHUM 10201	World Humanities II (Honors)	3
WHUM 10312	Modern World Literature	3
WHUM 10321	Modern World Literature (Global English Literature, Honors)	3

JWST 11700: (31602)

SPAN 12104, SPAN 12204: IAS students only

WHUM 10101, WHUM 10201, WHUM 10321: Honors Students Only

Pathways General Education Requirements for Honors Program and Macaulay Honors College Students at City

(See also Honors Programs (p. 153))

Honors Program students have the same Pathways General Education requirements as other students pursuing the same majors. They will satisfy their Pathways requirements, however, by taking the equivalent general education courses in Honors.

This will simultaneously satisfy requirements for Honors and their majors. For further guidance, please be sure to consult with your advisor in the Honors Center.

Pathways Course Descriptions

Pathways Course Descriptions

You will find descriptions of most Pathways offerings in the course listings for the departments or programs where they are offered. Pathways course descriptions not included in a particular department or program are be-low:

FIQWS: Freshman Inquiry Writing Seminar

FIQWS is a six-credit course taught by two instructors that combines a specific topic and an intensive writing seminar. In any semester, an exciting variety of FIQWS sections are offered. In the topic component

of FIQWS, a student might explore a famous writer or artist, a particular school of philosophy, a scientific discovery or key historical event. In the writing component of FIQWS, an instructor will guide a student in writing essays and research papers concerning the subject of the seminar. Students who fail FIQWS should use Engl. 11000 to use the F policy on the writing portion of FIQWS.

3 credits of each 6 credit FIQWS are allocated to an area of the Flexible Core (topic section) and 3 credits are allocated toward the English Composition requirement (writing section). The Flexible Core variations are:

FIQWS 10003 – World Cultures and Global Issues (Cultural/Historical Emphasis) taken with FIQWS 10103 – English Composition

FIQWS 10005 – World Cultures and Global Issues (Literary) taken with FIQWS 10105 – English Composition

FIQWS 10008 – Individual and Society taken with FIQWS 10108 – English Composition

FIQWS 10011 – Scientific World taken with FIQWS 10111 – English Composition

FIQWS 10013 – Creative Expression taken with FIQWS 10113 – English Composition

FIQWS 10015 – US Experience in its Diversity taken with FIQWS 10115 – English Composition

FIQWS 10045 – Philosophy, College Option taken with FIQWS 10145 – English Composition

FQUAN: Freshman Quantitative Analysis

3 credit course that fulfills the basic quantitative requirement for CLAS students, but is usually taught in a department other than Math. It can examine the data and trends surrounding a specific issue, or look at quantitative applications in other fields such as a science, psychology, sociology, etc. FQUANS may be offered as smaller thematic courses or as large lectures that break down into recitation sections.

SCI 10001: Man and Nature: Life (Honors)

For students in the City College Honors Program and the Macaulay Honors College. An exploration of the biological basis of life on earth and the impact of man's activities on its quality and continued survival. Those enrolled will participate in a seminar designed to permit in-depth examination of important issues related to the course content. 3 lect., 2 rec./lab hr./wk.; 4 cr.

SCI 10101: The Physical Universe (Honors)

For students in the City College Honors Program and the Macaulay Honors College. A broad exposure to the physical sciences with heavy stress on the scientific method of inquiry and investigation. The basic principles of physics and chemistry; application to some phenomena of astronomy, geosciences, chemistry and physics. 3 lect., 2 rec./lab hr./wk.; 4 cr.

USSO 10100: Development of the U.S. and its People

Analysis of how a powerful nation-state evolved from a tiny offshoot of European colonial expansion. Elucidates major forces that have shaped the modern world: religion, land policies, technology, industrial capitalism, democracy, nationalism, socialism, racism, sexism, and imperialism. 3 hr./wk.; 3 cr.

USSO 10101: Development of the U.S. and its People (Honors)

For students in the City College Honors Program and the Macaulay Honors College. An alternative version of the introductory course designed to provide more student participation and writing. 3 cr.

WCIV 10100: Prehistory to 1500 A.D.

An examination of the civilizations of Asia, Africa, Europe and the

Americas through a comparative study of selected places and themes. The dynamics of hunter/gatherer, pastoral and agrarian societies, urbanization, trade, imperialism, slavery, feudalism, the centralization of the state, religion and secular thought are among the topics discussed. 3 hr./wk.; 3 cr.

WCIV 10101: World Civilizations (Honors)

For students in the City College Honors Program and the Macaulay Honors College. A trans-cultural, geographically and regionally balanced study of specific themes found in both WCIV 10100 and WCIV 10200 courses. Emphasis on a theoretical perspective of the topics and their significance today. 3 hr./wk.; 3 cr.

WCIV 10200: 1500 A.D. to the Present

A study of the major forces that have shaped the modern world of Asia, Africa, Europe and the Americas. Selected themes include the interaction of the Western and non-Western world, the scientific revolution, capitalism, imperialism, industrialization, economic growth and stagnation, revolutions, counter-revolutions, modern political ideologies, the global crisis of the 20th century and emerging global interdependence. 3 hr./wk.; 3 cr.

WHUM 10100: World Humanities I

An introduction to world literature and its relationship to the traditions and societies from which it springs. Study of major works from antiquity to the seventeenth century. 3 cr.

WHUM 10101: Literature in the Human Experience (Honors)

For students in the City College Honors Program and the Macaulay Honors College. Defines what literature is and determines its relationship to human existence. The various types of literature and the role of form and structure in the meaning of the whole. Literature as a mirror of the variety and continuity of human experience. Extensive reading and individualized writing assignments. 3 hr./wk.; 3 cr.

WHUM 10200: World Humanities II

An introduction to world literature and its relationship to the traditions and societies which it springs. Study of major works from the eighteenth century to the contemporary period. 3hr./wk.; 3 cr.

WHUM 10201: World Humanities II (Honors)

For students in the City College Honors Program and the Macaulay Honors College.

WHUM 10312: Modern World Literature

Modern World Literature

WHUM 10321: Modern World Literature (Global English Literature, Honors)

An enhanced version of WHUM 10312 for students in the Honors Program. A study of modern world literature through the works of contemporary Anglophone writers from Asia, Africa, the Caribbean, and Australia. Topics include the condition of post-colonialism as well as the more recent globalization of English and thus the globalization of literature in English.

PHIL 11250: Scientia: the Unity of Knowledge

Is knowledge one type of thing, or a number of different things? Does it make sense to integrate scientific, mathematical, humanistic and artistic knowledge? If so, how do we do that while respecting the distinctive contributions of each field? We will explore what knowledge is and how we make sense of it.

PHIL 34905: Title: Biomedical Ethics

Biomedical Ethics is a philosophical overview of leading theories, principles, and problems in the field of bioethics. Ethical theories and principles are examined to provide a theoretical structure for analysis of concrete ethical problems. The course considers the ethics of the

doctor-patient relationship, including paternalism, informed consent, confidentiality, and truth telling, as well as larger systemic issues of social justice and access to health care. Topics in reproductive ethics, end-of-life ethics, and some of the newest developments in the field arising from genetics and neuroscience are also discussed. Extensive use is made of case studies.

MED 10000: Introduction to Drug Abuse

Description: In this freshman undergraduate core course on drug abuse and addiction, the emphasis is to be on a broad acquaintance with the principles and systems involved in drug addiction and the mechanisms by which these issues may be ameliorated. The subject matter is sufficiently broad to elicit interest in undergraduate students, yet provides enough information, regarding the various major categories of abused substances, that a student interested in further pursuit of studies in this field will have a solid base upon which to build. This course will be particularly useful for students interested in physiological or clinical psychology and those considering careers such as medicine, law, education, public policy, law enforcement, social work, as well as to those who seek to learn about the impact of drug addiction on the individual and society. The course will define addiction and other terms used to describe drug abuse. It will address why individuals abuse drugs, consider the interactions between drug taking behavior of individuals with social and legal values of the community and the consequences of chemical dependency and treatment options. It will also explore the neurobiological and pharmacological basis for the actions of major drugs of abuse, animal models useful in understanding the basis of action of these drugs, and will address future directions in the field. The classes will be team-taught by a sociologist, an anthropologist and neuropharmacologists.

EAS 10000: The Dynamic Earth

Basic concepts of geology. The materials, structures, and surface features of the earth, and the processes which have produced them. 3. hr./wk.; 3 cr.

Gateway Courses into Majors (Pathways)

Although complete major requirements vary in most cases from one CUNY college to another, faculty committees have designated a minimum of three "gateway" courses leading into several of CUNY's most popular majors. Students who anticipate pursuing one of these majors can take the designated courses and will be able to transfer them for major credit seamlessly between CUNY colleges that offer the major. The list of participating majors and gateway courses appears below. For more information on Pathways please go to <http://www.cuny.cuny.edu/gened/general-education.cfm>.

Biology

Pathways Gateway Course	Corresponding Course at College	
	Course Prefix /Number	Course Title
Introductory Majors Biology (Molecular and Cellular Biology)	BIO 10100	Biological Foundations I
Introductory Majors Biology (Organismic Biology)	BIO 10200	Biological Foundations II
General Chemistry I	CHEM 10301	General Chemistry I
General Chemistry II	CHEM 10401	General Chemistry II
Pre-calculus	MATH 19500	Pre-calculus

*CUNY colleges differ in the sequencing of their two Introductory Biology courses. A faculty committee outlined topics to be covered in each course. One course will cover Cellular and Molecular Biology, while the other course will cover Organismic Biology. The order in which the sequence is offered is to be left to the discretion of each college.

Economics

Pathways Gateway Course	Corresponding Course at College	
	Course Prefix /Number	Course Title
Introduction to Macroeconomics	ECO 10350	Principles of Macroeconomics
Introduction to Microeconomics	ECO 10250	Principles of Microeconomics
Introductory Statistics	ECO 20150	TBD

English

Pathways Gateway Course	Corresponding Course at College	
	Course Prefix /Number	Course Title

Pathways Gateway Course	Corresponding Course at College	
	Course Prefix /Number	Course Title
English Composition	FIQWS 10103, FIQWS 10105, FIQWS 10108, FIQWS 10111, FIQWS 10113, FIQWS 10115, FIQWS 10145	Freshman Inquiry Writing Seminars
	ENGL 11000	Freshman Composition
Introduction to Literature	WHUM 10100, WHUM 10101, WHUM 10300	World Humanities
Introduction to Literary Studies	ENGL 25000	Introduction to Literary Study

*"Introduction to Literature" includes three options, of which each college would adopt only one: "Introduction to World Literature," "Introduction to Writing about Literature," or "Introduction to English, American, or Anglophone Literature."

Psychology

Pathways Gateway Course	Corresponding Course at College	
	Course Prefix /Number	Course Title
Introduction to Psychology	PSY 10200, PSY 10299	Applications of Psychology in the Modern World
	PSY 10101	Psychology for Freshmen Honors Students
Abnormal Psychology	PSY 34800	Abnormal Psychology
Personality Psychology	PSY 24600	Introduction to Human Development: Infancy and Childhood
Lifespan Development	PSY 22600	Introduction to Life-Span Development

*The Psychology major committee recommended the following: "Introduction to Psychology;" either "Abnormal Psychology" or "Personality Psychology;" either "Child Development" or "Lifespan Development." The committee noted that some colleges offer both "Abnormal Psychology" and "Personality Psychology," and some colleges offer both "Child Development" and "Lifespan Development." In these cases a college may accept both courses toward the major.

Political Science

Pathways Gateway Course	Corresponding Course at College	
	Course Prefix /Number	Course Title

Pathways Gateway Course	Corresponding Course at College	
Introduction to American Government	PSC 10100	U.S. Politics and Government
Introduction to Political Science		N/A
Urban Politics	PSC 21000	Urban Politics
Global Issues/Issues in International Relations	PSC 25000	Contemporary International Relations

Pathways Gateway Course	Corresponding Course at College	
Psychological Foundations of Education	EDCE 20600	Observing Children and Their Development
Arts in Education	ART 15500	Art in Education

*Each college with a Political Science major will offer at least three of these courses and will accept any of these four courses for credit toward major requirements.

Sociology

Pathways Gateway Course	Corresponding Course at College	
	Course Prefix /Number	Course Title
Introduction to Sociology	SOC 10500 (SOC 10501)	Individual, Group and Society: An Introduction to Sociology (Introductory Sociology For Freshman Honors Student)
Social Institutions	SOC 23700	Foundations of Sociological Theory
Social Institutions	SOC 25400	Sociology Problems
Social Inequality		
Social Inequality		

*The Sociology major committee identified three areas: "Introduction to Sociology," "Social Institutions," and "Social Inequality." Each college with a Sociology major will offer either one course in each of the three areas, or will offer two courses in one area and one course in another area. No more than one course may be placed in the Introduction to Sociology area.

Teacher Education

Pathways Gateway Course	Corresponding Course at College	
	Course Prefix /Number	Course Title
Social Foundations of Education	EDUC 22100	Urban Schools in a Diverse American Society
	EDCE 22200	The school in American Society: Bilingual Education in the Urban School

Department of SEEK Counseling and Student Support Services/The Percy Ellis Sutton SEEK Program

Professor E. Maudette Brownlee, Chair/Director • Department Office: NA 5/226 • Tel: 212-650-5774

Programs and Objectives

The Department administers the Percy Ellis Sutton SEEK (Search for Education, Elevation, and Knowledge) Program. Funded by New York State and available at each of the CUNY senior colleges, SEEK is a higher education opportunity program that provides a comprehensive array of services to promote and support the successful academic achievement of qualifying students. The major SEEK services consist of counseling, supplemental academic support, and additional financial assistance.

Admissions

To qualify for admission to City College through SEEK, students must be New York State residents and meet specific income and academic criteria. The academic requirements vary among the college's different divisions and schools. Students are eligible for the SEEK Program only as first-time freshmen or as transfer students from another New York State higher educational opportunity program (i.e. CD, EOP, or HEOP).

Students who are interested in applying for the SEEK Program should complete the appropriate section of the CUNY Freshman application (or Transfer application). For further details regarding admission criteria and procedures, contact the City College Admissions Office.

Program Requirements

To help prepare new students for college, all incoming SEEK freshmen are required to attend the summer program which consists of academic workshops and a college orientation workshop. In their first semester, Program freshmen are enrolled in the department's mandatory New Student Seminar, a semester-long college development course. Once enrolled, SEEK students must meet the college's general education requirements and those of their specific majors to earn a degree.

Counseling

Extensive counseling is a major component of the Program's services and an important complement to instruction. Each student is assigned a counselor at the time of enrollment and continues to receive counseling support until graduation. Counselors work with students individually and in small groups. They address a broad range of issues that impact student success including personal and social concerns, academic planning, study strategies, career selection, and financial management. SEEK counselors also teach the department's New Student Seminar and conduct a variety of personal development workshops. They also consult with faculty and staff in other department to develop special initiatives designed to improve student success.

Tutoring and Supplemental Instruction

A range of tutorial and academic support services are offered to SEEK students through the program's Peer Academic Learning (PAL) Center. Specially-trained peer tutors and graduate students provide one-on-one tutoring in most subject areas and for a wide variety of specific courses. Tutor-facilitated study groups, skills workshops, supplemental instruction, and preview workshops are all offered to augment in-class instruction and enhance student learning. The SEEK Computer Lab, staffed by knowledgeable computer technicians and equipped with state of the art hardware and software, is also available to Program students.

Financial Aid

SEEK students are eligible for additional financial assistance in the form of a book stipend, college fees, and additional semesters of tuition support through TAP (Tuition Assistance Program.) The amount of assistance provided is based on need, as determined by financial aid income guidelines.

Departmental Activities

Each year, the SEEK department holds several student events. The major ones are the SEEK Awards Program and Salute to Graduating Seniors, the New Student Assembly, Transfer Students' workshops, Chi Alpha Epsilon National Honor Society induction, and the SEEK Scholars reception. In addition, the SEEK Club, which is open to all program students, sponsors a variety of activities throughout the academic year.

Departmental Awards

Several awards are presented annually, including the top three departmental awards: Outstanding SEEK Graduate of the Year, Outstanding Scholastic Achievement, and the Exemplary Freshman of the Year. Students may be nominated for an award by any SEEK faculty or staff member, and selections are made by the SEEK Awards Committee.

Faculty/Staff

E. Maudette Brownlee, Associate Professor and Chair/Director
B.A., Albion College; Ph.D., Teacher's College (Columbia University)

Debra Kennedy, Lecturer
B.S., Hunter College; M.A., New York Univ.

Hawai Kwok, HE Associate
A.A., BMCC; B.A., New York University; M.A., The City College of New York

Marie C. Nazon, Lecturer
B.A., Fordham Univ.; M.S., Columbia Univ. School of Social Work; Ph.D. CUNY Graduate Center

Sherri L. Rings, Associate Professor
B.A., Michigan State Univ.; M.S., Purdue University, Ph.D.

Alice Shepard, Assistant Professor
B.A., Brown University; Ph.D., CUNY Graduate Center

Gregory Thompson, Assistant Professor
B. A. John Jay College, M.A., Ed.M, Teachers College, Columbia University; Ph. D. Fordham University

Mara Washburn, Associate Professor
B.A., Haverford College; Ed.M., Harvard Univ.; Ph.D. New York Univ.

Ana Zevallos, Associate Professor
B.A., SUNY (Stony Brook), M.S., Ph.D.

Professors Emeriti

Louis Beckenstein

Lillian Brown

Frances Geteles

Student Support Services Program

The Student Support Services Program offers academic, career, financial and personal counseling to non-SEEK low-income first generation students with a demonstrated need for academic services. The program offers supplemental, individual and group tutoring in all subject areas. Group workshops in career exploration, financial aid options, GRE preparation, computer instruction, stress management, test anxiety, time management and research techniques are offered during the academic year. Cultural activities, mentoring, community service opportunities, field trips, an honors society, and an awards ceremony are also part of the SSSP.

Freshmen and sophomores may be able to receive grant aid based on financial need. Upper division and outstanding lower division students may serve as paid tutors and interns within the program. Students with advanced academic standing may qualify for the Zitrin Peer/Tutor Scholarship Program (NA 6/148, 212-650-6829).

Academic Advisement

Academic Advising

All City College professional schools and academic divisions and special programs have a professional academic advising staff to assist their majors. Students are encouraged to see an academic adviser at least twice a semester.

Center for Worker Education

The Department of Interdisciplinary Arts & Science
25 Broadway, 7th Floor
212-925-6625 x236

Early Childhood Education

25 Broadway, 7th Floor
(212)-925-6625 x235

Grove School of Engineering

Location: ST 209/2M7
Phone: (212)-650-8020/40

Colin Powell School

Location: NAC 6/293
Phone: (212)-650-8551

Division of Science

Location: Marshak Plaza
Phone: (212)-650-6768 or 5780

Honors Center

Location: NAC 4/150
Phone: (212)-650-7980 or 8474

Humanities & Arts

Location: NAC 5/225
Phone: (212)-650-8166

School of Education

Location: NAC 3/223A
Phone: (212)-650-5316

SEEK

Location: NAC 5/226
Phone: (212)-650-6655

Spitzer School of Architecture

Location: Spitzer 132
Phone: (212)-650-7307

New Student Experience Center

The New Student Experience Center (NSEC) is the campus home for First Year students (freshmen) who have not decided on an academic major or who are completing requirements for entry into one of City College's professional schools. We provide our students with individualized academic advisement, career/major exploration events, college survival skills workshops and the support necessary to be successful. Each NSEC student is assigned an advisor that they will work with during their time with us. This allows the advisor and student to develop a relationship and allows the advisor to give each student the support they need.

The transition to a senior college can be stressful. There are new rules, new expectations, new responsibilities, and many new people. The NSEC helps to reduce this stress and provide students with resources, support, and a peer community to make this transition a smooth one. As we say, "We've got your back!"

The Gateway Academic Center

The mission of The Gateway Academic Center (GAC) is to meet the needs of undeclared transfer and continuing students. The GAC also provides a range of support services to students who have not yet completed all of the requirements to apply to a professional school. The GAC guides these students by addressing such issues as major choice, degree progress, research, career options and more. The GAC offers mentoring, tutoring, workshops and special events to help students navigate these critical years to completion of the degree.

Tutoring Services

Many programs and departments in the College offer tutoring services to students. Information on the major tutoring programs is provided below. Students should ask their instructors or academic advisors about other services.

Biology Resource Center

The Biology Resource Center, located in the Marshak Science building room 502, is a drop-in facility designed to allow students to supplement classroom and laboratory instruction individually or with study-groups. Computers offering access to the internet and software packages featuring practice problems, self-tests, models and slides are available for student use, as well as hardcopy textbooks.

Math Physics Tutoring Center

The Math Physics Tutoring Center, located in MR-418S, is staffed by tutors who are advanced undergraduate and recent graduate students. Drop-in tutoring services are available for Physics PHYS 20300, PHYS 20400, PHYS 20700 and PHYS 20800 and MATH 19000, MATH 19500, MATH 20100, MATH 20200, MATH 20300, MATH 20500, MATH 20900, and all 300 level courses.

City College Academy for Professional Preparation (CCAPP) Tutoring

CCAPP offers tutoring in the following courses: BIO 10100, BIO 10200, BIO 20600, BIO 20700, BIO 22900, CHEM 10301, CHEM 10401, CHEM 26100, and CHEM 26300. Workshops for additional courses are offered based on student demand. Tutoring takes place in the CCAPP Student Center, MR-1005.

Language Tutoring

The Department of Classical and Modern Languages (CMLL) and Literatures offers free tutoring to any student enrolled in courses who needs additional help. Tutors are advanced students who have been recommended by the faculty and who have been tested by our department. Tutoring takes place in our department on a regular basis. The schedule is posted outside the department office, NA 5/223. For information call Mrs. Nancy Gutierrez or Ms. Rosa Martínez 212.650.6731.

CMLL also houses the French and Spanish Writing Center, which is a free service intended to help all students taking any French or Spanish course with their writing in the target languages. For information, contact Prof. Regina Castro-McGowan 212.650.6731.

The Writing Center at The Samuel Rudin Academic Resource Center

The CCNY Writing Center offers one-on-one and online tutoring for all CCNY students who are working on papers for their classes or who need advice with letters or personal statements. Students may make an appointment in advance or drop by to meet with a tutor. Computers are also available for student use. There is a smart classroom where faculty may bring classes to receive an orientation to all the Writing Center has to offer.

Academic Requirements and Policies

Academic Appeals

The faculty of each of the Schools defines the degree requirements, academic standards, and rules, and in general has jurisdiction over all of the courses offered by that School. Each of the Schools has a Committee on Course and Standing charged with oversight and enforcement of these matters and dealing with special cases and appeals. Students have the right to appeal to the appropriate Committee on Course and Standing any decision made by individual faculty members or administrators about these academic matters. Students must consult with their academic advisor for the appropriate appeals procedure. The Committee on Course and Standing is the final authority on enforcement of curriculum, degree requirements, academic standards, grades and academic rules.

Grades

Students who wish to dispute their final grades in a course must first contact the instructor who will provide a breakdown of the calculation of the grade in writing. If the student is still not satisfied, he or she can appeal to the Chair of the department and must provide a copy of the instructor's response in their appeal. If the student is still not satisfied, they can then appeal to the Dean for their ruling. Finally, if the student is still not satisfied, then they can appeal to the appropriate Committee on Course and Standing. Copies of all of the previous rulings must be included in the appeal. Students should be aware that the Committee will not regrade their work, but at most will offer the student a W grade for the course if the appeal is approved. A student has one semester from the end of a course (not including summer term and prior to graduation) to dispute a grade given in a College of Liberal Arts and Sciences (CLAS) course.

Academic Standards

Students are expected to maintain minimum G.P.A. requirements both overall and in major courses; not to withdraw from twelve credits during any two consecutive academic years; and pass all required courses in sequence. All new students—whether or not they are Math-proficient—are required to take the CUNY Assessment Test in Mathematics (Math 3). Test results will be used to place student in the appropriate Mathematics course. ESL and SEEK students should consult with their advisors regarding compliance with these requirements.

Academic Warning, Probation and Dismissal

Students who fail to meet the College's academic standards listed below are placed on probation, a warning that unless academic performance improves the student will be subject to dismissal. A student is placed on academic probation when he or she fails to achieve the required standards whether or not notification has been received from the College. Students must make satisfactory progress toward the degree. They should be aware that poor academic performance threatens their financial aid and scholarship eligibility. During this probationary period, students who make satisfactory academic progress will continue to maintain their academic standing in the College but may lose their eligibility for financial aid.

Total Credits Attempted	Minimum Cumulative G.P.A.
0-12	1.5
13-24	1.75
25 and over	2.0

Academic standards are enforced by each School's Committee on Course and Standing, which acts through a dean or director. The

Committee may restrict the number of courses for which a student can register, require that a student take certain courses, or prohibit a student from taking certain courses.

Students who have been placed on probation will not be permitted to participate in intercollegiate athletics; serve as officers of student government; serve as editor of a student newspaper; serve as manager, producer or editor of a student radio or TV facility; or take part (in a principal role) in a College-sponsored theater, dance, music or film production unless doing so as part of a specific College course.

Students who fail to achieve the above academic averages while on probation will be dismissed from the College.

The professional schools may have additional or modified academic standards; students enrolled in the professional schools are advised to consult their advisors and appropriate sections of this *Bulletin*.

Appeals

Students may appeal an academic warning, probation or dismissal decisions by writing to the Committee on Course and Standing of the School in which they are enrolled.

ESL Dismissal

CUNY policy stipulates that all senior college students may not repeat an ESL course more than once after September 1996. ESL students have four (4) semesters to pass the CUNY reading and writing proficiency tests.

Application for Graduation

Degrees are conferred four times each year: January, February, May/June and September. Candidates for graduation must file an Application for Degree Form online by the specified deadline. Candidates who do not comply with deadlines will not graduate on time. Please consult the academic calendar published online for the application deadlines.

Auditing

Students wishing to audit a course must select audit status at the time of registration. Auditors must register in the normal manner and pay required tuition and fees. No credit or grade will be given for audited classes. Auditor status cannot be changed to credit status after the closing date for change of program. Likewise, credit status cannot be changed to auditor status after the change of program period. The form may be picked up in Registrar's Office, in the Wille Administration Building, Room 102.

College of Liberal Arts and Science 10-Year Forgiveness Policy

A CCNY undergraduate student who applies for re-entry to the college after an absence of at least 10 years is eligible to make use of the CCNY Forgiveness Policy. The student may apply to the CLAS Committee on Course and Standards for re-entry with forgiveness of prior grades, and if approved, will be granted re-entry and placed on probation until they have completed 12-24 consecutive credits with a cumulative G.P.A. of 2.0 or better. Once this condition is met, the Committee on Course and Standing will review their record and convert just enough of the old failing and D grades to W in order to raise the overall GPA and the GPA in their major to 2.0. In removing grades preference will be given to grades no longer in use at the College, e.g. FAB and WF and administrative failing grades, e.g. WU and FIN. The student must maintain a 2.0 in both their major and overall in order to be eligible for graduation. If the student fails to meet the conditions of probation, the

student will be subject to final academic dismissal. A student whose transcript has been treated in this manner will not be eligible for Latin Honors.

College of Liberal Arts and Science - First and Second Semester Grading

All grades of F submitted by an instructor for first- and second-semester freshmen in selected College of Liberal Arts and Science (CLAS) courses determined by each department will be converted to NC by the Registrar. An NC will count towards determining the number of limited repeats students are allowed for each course. The grade of WU will remain on the student's record. If a grade of INC is not resolved, it will convert to FIN, and remain on the student's record. Note that English 11000 and the Pathways English Composition portion of FIQWS are not eligible for this policy.

For the purpose of the conversion of an earned F to the NC grade, a first-semester freshman is defined as a student who is: A. A full-time student in his or her first semester at City College with fewer than 12 credits from any institution of higher learning; AP and College Now credits do not count in this tally. For first-time fall semester entrants who attended the Summer Session immediately preceding their entry, an NC will cover all F grades submitted by an instructor both for that Summer Session and the immediately following Fall semester. Early College students with 12 or less credits will also be considered first-semester freshmen; or

B. A part-time student in which his or her first 12 credits are attempted at City College, and who has fewer than 12 credits from any institution of higher learning; AP and College Now credits do not count in this tally. A second semester freshmen for this policy is defined as:

A full-time or part-time student who has completed at least 12 credits of courses at City College, but has less than 24 completed credits at City College.

Students should be aware that a freshman must earn at least 6 credits in the first semester with an overall GPA of 1.5 and at least 15 credits by the end of the second semester with an overall GPA of 1.8 or their financial aid may be affected.

First and Second Semester Grading List

Courses

ANTH 10100	General Anthropology	3	BIO 22800	Ecology and Evolution	4
ANTH 10104	General Anthropology	4	BIO 22900	Cell and Molecular Biology	4
ARAB 12300	Introductory Arabic I	3	BIO 24700	Human Anatomy and Physiology II	4
ART 10000	Introduction to the Visual Arts of the World	3	BIO 24800	Human Anatomy and Physiology II	4
ART 10004			CHEM 10300	General Chemistry I	
ART 10100	2-Dimensional Design	3	CHEM 10400	General Chemistry II	
ASIA 10100	Asian Cultures and Peoples	3	CHIN 12300	Introductory Chinese (Mandarin) I	3
ASIA 10200	Asian Literature in English Translation	3	CLSS 12100	Greek and Latin Roots in the English Language	3
ASIA 20100	Asians in America	3	EAS 10000	The Dynamic Earth	3
ASIA 20200	Contemporary Asia	3	EAS 10100	The Atmosphere	3
BENG 19300	Bengali for Heritage Speakers and Listeners I	3	EAS 10300	Environmental Geology	3
BIO 10000	Biology: The Strategy of Life	3	EAS 10400	Perspectives of Global Warming	3
BIO 10100	Biological Foundations I	4	EAS 10600	Earth Systems Science	4
BIO 10200	Biological Foundations II	4	ECO 10150	Principles of Management	3
BIO 10004	Human Biology	3	ECO 10250	Principles of Microeconomics	3
BIO 10050-10099	Special Topics in Biology for Freshman & Non-Science Majors	3-4	ECO 10350	Principles of Macroeconomics	3
BIO 20600	Introduction to Genetics	4	ECO 10400	Introduction to Quantitative Economics	3
BIO 20700	Organismic Biology	4	ECO 19150	Honors Principles	3
			ENGL 15500	American Literature	3
			ENGL 21000	Introduction to Academic Writing	3
			ENGL 22000	Introductory Workshop in Creative Writing	3
			ENGL 23000	Writing Workshop in Prose	3
			ENGL 25000	Introduction to Literary Study	3
			ENGL 25100-25400	Historical Survey of British Literature	3
			ENGL 26000-26900	Studies in Genre	3
			ENGL 27000-27010	Literatures of Diversity	3
			ENGL 28000	Introduction to Comparative Literature	3
			FREN 12300	Introductory French I	3
			GERM 12300	Introductory German I	3
			GRK 12100	Elementary Greek	3
			CLSS 12100	Greek and Latin Roots in the English Language	3
			HEB 12300	Introductory Hebrew I	3
			HNDI 12300	Introductory Hindi I	3
			HIST 20100	The Ancient World: The Near East and Greece	3
			HIST 20200	The Ancient World: Rome	3
			HIST 20400	Early-Modern Europe	3
			HIST 20600	Modern Europe	3
			HIST 21300	The Historian's Craft	3
			HIST 24000	The United States: From Its Origins to 1877	3
			HIST 24100	The United States: Since 1865	3
			HIST 25100	Traditional China	3
			HIST 25300	Modern China	3
			HIST 25400	Traditional Japan	3
			HIST 25500	Modern Japan	3
			HIST 26200	The Middle East Under Islam	3
			HIST 26300	Traditional Civilization of India	3
			HIST 26400	Modern India	3
			HIST 27600	Africa and the Modern World	3
			HIST 27700	Africa Since Independence	3
			HIST 28000	Latin America in World History	3
			HIST 28100	Colonial Latin America	3
			HIST 28200	Modern and Contemporary Latin America	3

IAS 10000	Writing for Interdisciplinary Studies I	4
IAS 10100	Writing for Interdisciplinary Studies II	4
IAS 10300	Interdisciplinary Global Studies	4
IAS 10400	Nature & Human Beings I	4
IAS 10500	Nature and Human Beings II	4
INTL 20100	International Studies: A Global Perspective	3
INTL 12300		
ITAL 12300	Introductory Italian I	3
JAP 12300	Introductory Japanese I	3
LAT 12100		
MATH 15000	Mathematics for the Contemporary World	3
MATH 17300	Introduction to Probability and Statistics	4
MATH 18000	Quantitative Reasoning	3
MATH 18504	Basic Ideas in Mathematics	4
MATH 19000	College Algebra and Trigonometry	3
MATH 19500	Precalculus	3
MATH 20100	Calculus I	3
MATH 20500	Elements of Calculus	4
MCA 10100	Introduction to Media Studies	3
MCA 10500	Introduction to Media Production	3
MCA 12100	Introduction to Film Studies	3
MUS 10100	Introduction to Music	3
MUS 10200	Introduction to World Music	3
MUS 14500	Introduction to Jazz	3
PHIL 10200	Introduction to Philosophy	3
PHIL 20100	Logical Reasoning	3
PHIL 20200	Introduction to Logic	3
PHYS 20300	General Physics I	4
PHYS 20400	General Physics II	4
PHYS 20700	University Physics I	4
PHYS 20800	University Physics II	4
PORT 12300	Introductory Portuguese I	3
PSC 12504	Introduction to Public Policy	4
PSY 10101	Psychology for Freshman Honors Students	3
PSY 10200	Applications of Psychology in the Modern World	3
PSY 21500	Applied Statistics	4
PSY 22600	Introduction to Life-Span Development	3
PSY 24600	Introduction to Human Development: Infancy and Childhood	3
PSY 24700	Social Psychology	3
PSY 24900	Psychology of Personality	3
PSY 25300	Cognitive Psychology: Thinking, Knowing and Remembering	3
PSY 25400	Brain, Mind and Experience	3
SOC 10500	Individual, Group and Society: An Introduction to Sociology	3
SPAN 12104	Intro Spanish I	4
SPAN 12204	Intro Spanish II	4
SPAN 12300	Introductory Spanish I	3
SPAN 19300	Spanish for Heritage Speakers and Listeners I	3
SPCH 11104	Speech Foundations	4
USSO 10100	Development of the U.S. and its People	3

WCIV 10100	Prehistory to 1500 A.D.	3
WCIV 10200	1500 A.D. to the Present	3
WHUM 10100	World Humanities I	3
WHUM 10200	World Humanities II	3
WHUM 10312	Modern World Literature	3
WS 10000	Women's/Gender Roles in Contemporary Society	3
WS 10004	Introduction to Women's and Gender Studies	4
YID 12300	Introductory Yiddish I	3
USSO 10100	USSO US Society	3

ANTH 10100: name changed at CPS FC to Introduction to Anthropology

HIST 20601: Honors

Course Loads for Full-Time Students

An average student program consists of twelve to fifteen credits. Students who are not on academic probation may take as many as eighteen credits. Students who wish to take more than eighteen credits must request permission from the dean of the school or division. Permission is granted only to students with outstanding records who have compelling reasons for making the request.

Students on probation must limit their programs to twelve credits or less if required by their program. Many forms of financial aid are contingent on full-time student attendance. Ordinarily, a student must register for at least twelve credits to be full-time. Students receiving financial aid should verify their full-time status with the Financial Aid Office, particularly when changing majors.

Course Numbering

As a general rule, course numbers reflect the level of difficulty of the course content. For a variety of reasons, some course numbers may not adhere to the description below. If in doubt about the level of a particular course, consult a departmental advisor.

10000-	introductory courses for lower division students
19900:	
20000-	beginning major courses intended for sophomores and juniors
29900:	
30000-	first level upper division courses; intermediate major courses
39900:	
40000-	advanced undergraduate courses intended for juniors and seniors
49900:	
50000-	advanced undergraduate courses
59900:	

Graduate Course Numbering

All graduate courses will contain a letter either before or after the course number.

Exception: Spitzer School of Architecture – Graduate courses are numbered 60000 and above.

Cross-listing of Undergraduate Courses Among Departments and Programs

Courses may be assigned two numbers in two different departments or programs in order to foster interdisciplinary study only upon approval of the Chairs and/or relevant Curriculum Committees of the program. Cross-listed courses must be at the same course level (unless approved by the Dean). No special topics courses may be cross-listed unless a course description has been filed with the Office of Scheduling and Workload.

Dean's List

Students are eligible for the Dean's List four times during their career at City College: the semester in which they become sophomores, the semester in which they become juniors, the semester in which they become seniors, and the semester in which they have completed twenty-four or more credits as seniors. Students are placed on the Dean's List for a particular year if they meet the following criteria:

1. A 3.2 grade point average.
2. Completed at least 24 credits at City College.
3. No grades other than A, B, C, D, W or P.

Degree Progress-Online Advisement

DegreeWorks is an easy-to-use software application that gives students access to their degree progress via the web on the CUNY Portal. It allows a student to view the courses required to complete the general education requirements, major and degree. Courses required for minors and concentrations also appear in DegreeWorks. A student can also conduct "What-If" audits to see the courses required to change the major.

Drop/Withdrawal from Courses

During the Change of Program period, students may make program changes during the first week of classes. If the student drops the course by the end of the third week of classes, it will not appear on the transcript. The student can drop the course(s) online until the end of the third week of classes. There will be a transaction fee applied if a student adds or drops a course once the semester begins; please refer to www.cuny.cuny.edu/bursar for fee information. Refer to the academic calendar posted on the College's website (www.cuny.cuny.edu) for pertinent dates. The Add/Drop is only required when special permission is required. The form must be signed by an academic advisor and returned to the Registrar's Office.

After the Change of Program period, and prior to the tenth week of classes, students may officially drop courses using CUNY First. Some divisions require that students obtain advisement before dropping a course. A grade of "WN" is assigned by the Instructor to students who never attended and did not officially withdraw. Students should be aware that dropping a course may affect their financial aid. All students receiving aid should consult with the Financial Aid office before dropping. The grade of "W" is assigned only when the student has officially withdrawn from the course.

Note: A student who withdraws from 12 credits or more within two academic years may be placed on academic warning; a student who drops 18 or more credits will be subject to dismissal. Dropping courses may cause a student to become ineligible for financial aid.

"F" Repeat Policy

The "F" repeat policy only applies to courses taken after 1990. The number of failing credits that can be deleted from the G.P.A. shall be limited to sixteen for the duration of the student's undergraduate enrollment in institutions of the University. If the second grade is C or higher (C- does not qualify) the original grade of "F" will not be used in the calculation of the G.P.A. (although the course and grade remain on the record). The revised G.P.A. will be used for academic progress and graduation minimum standards. The F grades will, however, apply to graduation honors and can affect other requirements for progress in the major. The implementation of the F policy varies in some of the Professional Schools.

Grade Point Average (G.P.A.)

A student's overall academic performance is measured by calculating the grade point average (G.P.A.). This average is found by using grades from each course on the student's record except those that have one of the following grades assigned: P, INC, W, WA, WN, PEN, AUD, NC.

Each grade received is assigned a numerical value called Quality Points, as described in the Grading System chart. The number of Quality Points multiplied by the number of credits the course carries is the total for the course. The G.P.A. is found by adding these totals and dividing this amount by the total number of credits attempted.

Grading System and Glossary

Grade	Explanation	Quality Points
A+	Exceptional	4.00
A	Excellent	4.00
A-		3.70
B+		3.30
B	Good	3.00
B-		2.70
C+		2.30
C	Satisfactory	2.00
C-		1.70
D	Passing	1.00
F	Failure/Unsuccessful completion	0.00
P	Pass	--
W	Withdrew	--
WA	Administrative withdrawal-applied to registered students lacking proof of immunization	--
WN	Never attended	--
WU	Withdrew unofficially (student attended at least one class)	0.00

Grade	Explanation	Quality Points
INC	Incomplete	--
FIN	F due to incomplete	0.00
Z	No grade submitted by instructor	--
PEN	Grade pending-usually used for issues of academic integrity	--
Y	Year or longer course of study	--
AUD	Auditor	--
NC	No Credit	--

Incomplete (INC) Grades

The grade of INC is given by the instructor in consultation with the student, with the following guidelines:

1. when the student has been doing passing work and the instructor believes the student can successfully complete the requirements of the course no later than the last day of the eighth week of the following semester, or its equivalent in calendar time, exclusive of Summer Session. The student must provide an acceptable and documented reason for not completing the course on time.
2. when a student has been absent from the final exam and a make-up exam is scheduled no later than the last day of the eighth week of the following semester, or its equivalent in calendar time, exclusive of Summer Session. Students must pay the make-up exam fee to the Bursar before taking the make-up exam. Extensions may be granted only by the Committee on Course and Standing of the School offering the course.
3. temporary grade awarded when the disposition of the final grade requires further evaluation for reasons other than the Procedures for Imposition of Sanctions related to the Board's Academic Integrity Policy.

When applying for an INC grade, an Incomplete Agreement Form may be required by the instructor and/or the department. The instructor may insist that the student obtain the permission of the Committee on Course and Standing (of the School offering the course) to complete the course.

The Registrar's Office will change the temporary grade of INC to failure (FIN) by the tenth week of the following semester unless the instructor has submitted a passing grade.

Majors, Minors, Concentrations and Dual Degrees

To declare or change an academic plan or sub-plan, students must bring a completed Declaration of Plan, Sub-Plan and Minor form to the Office of the Registrar in Room 102 of the Wille Administration Building. As this form requires faculty and/or advisor signatures and processing time, it is highly recommended that students submit the form 3 business days prior to the deadline published on the Academic Calendar. Plan declarations and changes processed after his date will be effective for the following semester.

The Academic Plan (Major)

All students must complete the requirements of their approved major in order to obtain a degree. Each department or program sets specific course requirements for its academic plans. These requirements are outlined in the departmental listings in this Bulletin; students should

consult with an appropriate advisor before declaring a major. Students must declare an academic plan, including a subplan (concentration), if needed, upon completion of 60 credits or risk losing eligibility for NYS financial aid.

Dual Academic Plans (Majors)

Students who wish to major in two fields should file a Declaration of Plan, Subplan and Concentration form, which must be signed by the appropriate department advisors and by the divisional dean(s). The requirements of both declared academic plans must be completed. Students wishing to complete two academic plans should discuss it at an early stage of their college career with an advisor in each of the two departments. No more than three courses may be credited to both academic plans

Dual Degrees

If a student wishes to obtain two separate degrees across different degree types such as a BS or BA, the student should declare the first major and complete those requirements. The student should then apply for admission as a second degree student. Ninety credits from the first degree will be counted toward the second degree. To obtain the second degree, an additional 30 credits and the requirements for the second major **must** be completed.

Minors

A number of departments offer a minor, which is a program of study of approximately 15 credits which can be taken in conjunction with the major. It should be noted that all degree candidates must have a major. The minor however is optional. Students declaring a minor in College of Liberal Arts and Sciences can have only one course overlap between the CLAS major and minor courses unless otherwise specified by the department or program of the minor.

Subplan (Concentrations)

Some academic plans require students to choose among subplans (concentrations) offered for the degree. Students should follow the courses recommended by their advisor to ensure that they complete the appropriate subplan. Students should include the subplan on the Declaration of Plan and Subplan Form when they file for a plan (major).

Pass/No Credit Option

Students in the professional schools, except for the School of Education, may not take courses on a pass/no credit basis, even if the courses are being taken as free electives. Students in the College of Liberal Arts and Science and in the School of Education may take certain courses on a pass/no credit basis, subject to the following restrictions:

1. The student may only elect up to twelve (12) credits of Pass/NC Courses (in addition to courses graded only Pass/NC).
2. The student must have completed at least 28 credits.
3. A student may take only one course per semester on a pass/no credit basis.
4. Required courses in the academic plan (major) and minor may not be taken for Pass/No Credit. Courses in the Pathways English composition I and II can not be taken for Pass/No Credit.
5. The deadline for students choosing the Pass/No Credit option is listed in the Academic Calendar and is usually the tenth week of the semester.
6. Students should be aware that courses taken on a Pass/No Credit basis may not be transferable to other institutions.

*Eligibility for some financial aid grants may be affected by use of P/NC grades. Students are responsible for checking if this applies to them before the P/NC option is taken.

Policy on Lateness and Absence

Students are expected to attend every class session of each course in which they are enrolled and to be on time. A WU grade will be assigned to a student by the instructor for excessive absence. Students are advised to determine the instructor's policy at the first class session. They should note that an instructor may treat lateness as equivalent to absence. No distinction is made between excused and unexcused absences. Each instructor retains the right to establish his or her own policy, but students should be guided by the following general College policy:

In courses designated as clinical, performance, laboratory or field work courses, the limit on absences is established by the individual instructor. For all other courses, the number of hours absent may not exceed twice the number of contact hours the course meets per week.

Repeating Courses

Students may not repeat a course they have already passed unless that course has been designated as repeatable in this Bulletin. In instances in which a course is repeated, the repeated course does not confer additional credit, and the average of the two passing grades is included in the GPA calculation. This limitation applies to courses taken at City College, courses taken at other colleges for credits that are transferred into CCNY, and to courses for which credit is granted by exemption examination or advanced placement examination. Courses designated as repeatable may confer additional credit, up to the maximum number of allowable credits, as stated in this Bulletin. Students are ultimately responsible for determining if the coursework they select is a repeat of prior coursework.

Students who do not successfully complete a course (grades of W, WU, F, FIN) may re-enroll for the course only ONCE without seeking advice from an Advisor. The absolute maximum number of times that a student may enroll in the same course is three. If the course is required for their major and if they do not pass after three tries, they must change majors or leave the College. The Committees of Course and Standing will rule on appeals to this policy.

Requirements for Graduation

Students who entered City College as first-time freshmen before September 1996 may be required to complete 128 credits.

Students who enrolled thereafter will be required to complete a total of 120 credits, to include major and general education/core requirements. Exceptions are the degree programs in Architecture, Engineering and the Sophie Davis School of Biomedical Education, which require more than 120 credits.

Students are expected to be familiar with the requirements of their degree programs. All requirements for the degree must be met before the date of graduation. The temporary grade of INC (including those assigned in the final semester of attendance) must be resolved prior to the date of graduation.

In addition, all "stops" must be cleared by the date of graduation. Failure to clear "stops" will result in the delay of the distribution of diplomas and the processing of requests for transcripts.

Upper-division students should have a preliminary graduation check conducted two semesters before the anticipated date of graduation by an advisor in their department or division. The final graduation check and certification is conducted in the appropriate Dean's Office.

Residency Requirement

To be eligible for a degree, a student must complete a minimum of 80 credits at the City College of New York, or they must completed the last 30 credits of their degree at City College. In addition, at least 60% of the major must be completed in residency at City College. All transfer students and second degree students (including those who are graduates of City College) are subject to the residency requirement. Graduates of City College who return for a second degree may not use coursework completed under the first degree to meet the residency requirement for a second degree from City College.

Student Complaints

Discrimination

The City College and The City University of New York are committed to addressing discrimination complaints promptly, consistently and fairly. Any City College employee, student, applicant for admission or employment or other participant in the College's programs or activities who believes he or she has been unlawfully discriminated against on the basis of age, color, disability, national or ethnic origin, race, religion, sex, sexual orientation, or veteran status may file a complaint in writing with the Office of Diversity and Compliance using the Discrimination Complaint Form by e-mail to the Interim Title XIX Coordinator, Ms. Jennifer Light, at jligh@ccny.cuny.edu, or by stopping in the EEO Compliance office in Shepard Hall, Room 109 A-D.

Sexual Assault

Please consult the Office of Affirmative Action, Compliance and Diversity Title IX Sexual Assault Policy web page.

Grades

See Academic Appeals (p. 298).

Other Complaints

Students with grievances concerning matters other than grades should first attempt to resolve the grievance at the department level through discussion with the faculty member(s) or department chair. If the matter is not resolved, the student or department may refer the problem to the appropriate academic dean, the Ombudsman, or the Vice President for Student Affairs, via the Student Complaint Procedure Form, who shall, if necessary, refer it to the Office of the Provost for further consideration and possible action. See also Procedures For Handling Student Complaints About Faculty Conduct In Academic Settings.

Undergraduate Graduation Honors (Latin Honors)

For students admitted to the College prior to Fall 2014 the graduation honors policy is as follows:

At graduation, there are three categories of honors for baccalaureate candidates.

- A degree summa cum laude is granted to students whose average in all subjects is at least 3.8.
- A degree magna cum laude is granted to students whose average in all subjects is at least 3.5.
- A degree cum laude is granted to students whose average in all subjects is at least 3.2.

Students who entered in August, 2014, or later, must have completed at least 50 credits in residence at City College and the GPA calculations for Latin Honors will be based solely on coursework taken at CCNY. For students who entered prior to August 2014, the GPA computation of graduation honors, will be based on all college work taken by students at institutions other than the City College is taken into account even if some of the work is not transferred.

A student may not obtain a higher honor (i.e. magna cum laude instead of cum laude) than their City College index indicates. Thus, if a student achieves a 3.3 index at the City College and has a combined index of 3.5, the honor of cum laude is awarded.

A student may not obtain a higher honor (i.e. magna cum laude instead of cum laude) than their City College index indicates. Thus, if a student achieves a 3.3 index at the City College and has a combined index of 3.5, the honor of cum laude is awarded.

Second degree Students are not eligible for graduation honors.

For students admitted to the College in Fall 2014 and after the graduation honors policy is as follows:

At graduation, there are three categories of honors for baccalaureate candidates.

- A degree summa cum laude is granted to students whose average in all subjects is at least 3.8.
- A degree magna cum laude is granted to students whose average in all subjects is at least 3.5.
- A degree cum laude is granted to students whose average in all subjects is at least 3.2.

Students must complete a minimum of 50 credits at City College to be eligible for Latin honors.

Only coursework completed at City College is taken into account in the computation of graduation honors.

Second degree students are not eligible for graduation honors.

Appendices

Appendix A

Governance

The Governance of The City College is the concern of all its members. All its constituencies—students, faculty, and administration—contribute to the maintenance and development of the College; each of the constituencies has its particular area of concern.

Because each constituency has the right to govern itself in areas that are its exclusive concern and responsibility, the Governance Charter sets forth the powers and organization of the various bodies within the College, and guarantees their autonomy on matters exclusively within their jurisdiction. But because the constituencies are interrelated, and because all must participate in the well being of the College as a whole, the Governance Charter also provides for communication between constituencies and advisory roles and joint participation on matters of mutual or general concern.

The following governance bodies carry out these duties.

The Undergraduate Student Senate and the Graduate Student Council, elected annually from and by their appropriate constituencies, represent the interests of the students. It is from among these bodies that student representation on college-wide bodies is drawn for consultative purposes.

The Faculty of each school (organized into a representative, elected council when there are more than 150 faculty members) approve courses, curricula, degree requirements, and criteria for student progress and retention. The College of Liberal Arts and Science has a general Faculty Council, plus one each for its divisions — Humanities and the Arts: Science and The Colin L. Powell School for Civic and Global Leadership (formerly Social Science); and the Division of Interdisciplinary Arts and Sciences. In each of the College's professional schools—the Sophie Davis School of Biomedical Education; the Grove School of Engineering; the Anne and Bernard Spitzer School of Architecture; and the School of Education — each school's entire faculty serves as its faculty council.

The Faculty Senate draws its elected representatives from the constituent academic units of the College and deals with such college-wide matters as inter-divisional programs, academic freedom, educational policy, and the allocation of the College's resources. Senators are elected by the faculty for three-year terms. In addition to the faculty, the following are members ex officio, without vote: the President, the Provost, all deans and vice presidents, and representatives of the student senates.

The Policy Advisory Council serves as a consultative body to the President on all major policy matters affecting the College and its members. It draws its members from all groups at the College, including the part-time instructional staff and the non-teaching staff.

Alumni Association Of The College

The first graduating class of 1853 of the New York Free Academy (as The City College of New York was originally known) organized the Alumni Association to form a community of friends with a shared experience and common goals. In 1913, the Association was incorporated, and is governed by a Board of Directors. At the Annual Meeting held in the Spring, dues paying members elect the officers of the corporation who guide its affairs. Officers who are elected annually include the President, three Vice Presidents, Secretary, Treasurer and Historian. In addition, thirty-six Directors from the membership-at-large are selected for staggered three-year terms. Two to three Directors from each of the special interest groups (affiliate groups and constituent societies), including their respective Presidents, are elected annually for one-year terms. Completing the Board of Directors are Honorary Directors selected by the President of the Corporation, and Life Directors, who are

former Presidents. The Board of Directors meets a minimum of four times a year.

The purpose and objectives of the Alumni Association are to advance the interests and welfare of the College, foster a spirit of fraternity/sorority and goodwill among graduate, service alumni and to offer financial, technical and networking support for today's students.

Representing special concerns, interests and educational specialties, the Association serves as the umbrella or parent to fourteen affiliate groups and two constituent societies including Alumni Varsity, Architecture Alumni, Art Alumni, Asian Alumni, Black Alumni, Center for Worker Education Alumni, Communications Alumni, Education Alumni, Latino Alumni, Political Science Alumni, ROTC Alumni, Science Alumni, Young Alumni, Psychology Alumni and the Business/Economics Alumni Society and Engineering School Alumni. The groups are each governed by a voluntary Board of Directors with officers and conduct activities to benefit alumni and today's students.

In recognition of the growing geographical diversity of alumni, the chartering of Alumni Chapters began after World War II. Fifty dues paying members living in a city outside the New York metropolitan area can secure a charter from the Alumni Association as an official Chapter. There are currently twelve active Chapters across the country including Washington D.C.; Palm Beach; South Florida; Northern California; Southern California; Orange County/ San Diego, California; Northern Nevada; Houston, Texas; Northern New Jersey; New England; Greater Chicago and most recently, Connecticut.

Rules and Regulations for the Maintenance of Public Order Pursuant to Article 129-a of the Education Law

<https://www.cuny.cuny.edu/sites/default/files/counseling/upl oad/Henderson-20Rules-14-moved.pdf>

Students Rights and Responsibilities

http://policy.cuny.edu/bylaws/article_xv/text/#Navigation_Location

CUNY Policy on Academic Integrity

City College's policy is the CUNY Policy on Academic Integrity:

http://www.cuny.edu/about/administration/offices/la/Academic_Integrity_Policy.pdf

In the City College, academic integrity issues are handled by the Academic Integrity Committee. This body handles complaints for all students, including undergraduates and graduates, those affiliated with Professional Schools and CLAS. Additional information may be found on the City College Academic Affairs web site.

<http://www.cuny.cuny.edu/academicaffairs/integrity-policies.cfm>

The City University of New York Policy on Acceptable Use of Computer Resources

http://policy.cuny.edu/manual_of_general_policy/article_iv/p olicy_4.01/text/#Navigation_Location

Domestic Violence and the Workplace

http://policy.cuny.edu/manual_of_general_policy/article_v/po licy_5.061/text/#Navigation_Location

Notice of Access to Campus Crime Statistics, the Campus Security Report, and Information on Registered Sex Offenders

The College Advisory Committee on Campus Safety will provide upon request all campus crime statistics as reported to the U.S. Department of Education, as well as the annual campus

security report. The campus security can be found at <https://www.cuny.cuny.edu/safety/report>

Public Safety On-campus resources:

1. Public Safety: Room NAC 4/201, (212) 650-7777
2. Counseling Center: MR J-15, 212-650-8222
3. Student Health Services: MR J-15 212-650-8222

Student Activity Fees and Auxiliary Enterprises

http://policy.cuny.edu/bylaws/article_xvi/text/#Navigation_Location

New York State Education Law, Article 5: S 224-a. Students unable because of religious beliefs to Register or attend classes on certain days.

1. No person shall be expelled from or be refused admission as a student to an institution of higher education for the reason that he or she is unable, because of his or her religious beliefs, to register or attend classes or to participate in any examination, study or work requirements on a particular day or days.
2. Any student in an institution of higher education who is unable, because of his or her religious beliefs, to attend classes on a particular day or days shall, because of such absence on the particular day or days, be excused from any examination or any study or work requirements.
3. It shall be the responsibility of the faculty and of the administrative officials of each institution of higher education to make available to each student who is absent from school, because of his or her religious beliefs, an equivalent opportunity to register for classes or make up any examination, study or work requirements which he or she may have missed because of such absence on any particular day or days. No fees of any kind shall be charged by the institution for making available to the said student such equivalent opportunity.
4. If registration, classes, examinations, study or work requirements are held on Friday after four o'clock post meridian or on Saturday, similar or makeup classes, examinations, study or work requirements or opportunity to register shall be made available on other days, where it is possible and practicable to do so. No special fees shall be charged to the student for these classes, examinations, study or work requirements or registration held on other days.
5. In effectuating the provisions of this section, it shall be the duty of the faculty and of the administrative officials of each institution of higher education to exercise the fullest measure of good faith. No adverse or prejudicial effects shall result to any student because of his or her availing himself or herself of the provisions of this section.
6. Any student, who is aggrieved by the alleged failure of any faculty or administrative officials to comply in good faith with the provisions of this section, shall be entitled to maintain an action or proceeding in the supreme court of the county in which such institution of higher education is located for the enforcement of his or her rights under this section.
 - 6-a. It shall be the responsibility of the administrative officials of each institution of higher education to give written notice to students of their rights under this section, informing them that each student who is absent from school, because of his or her religious beliefs, must be given an equivalent opportunity to register for classes or make up any examination, study or work requirements which he or she may have missed because of such absence on any particular day or days. No fees of any kind shall be charged by the institution for making available to such student such equivalent opportunity.
7. As used in this section, the term "institution of higher education" shall mean any institution of higher education, recognized and approved by the regents of the University of the State of New York, which provides a course of study leading to the granting of a post-secondary degree or diploma. Such term shall not include any institution which is operated, supervised or controlled by a church or by a religious or denominational organization whose educational programs are principally designed for

the purpose of training ministers or other religious functionaries or for the purpose of propagating religious doctrines. As used in this section, the term "religious belief" shall mean beliefs associated with any corporation organized and operated exclusively for religious purposes, which is not disqualified for tax exemption under section 501 of the United States Code.

Notification Under the Family Educational Rights and Privacy Act of Student Rights Concerning Education Records and Directory Information

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. They can be found at

<https://www.cuny.cuny.edu/registrar/ferpa>

Amendment To The Policy On Withholding Student Records

RESOLVED, That the existing Board of Trustees policy with respect to the withholding of student records as last amended on February 22, 1993, Cal. No. 7.c., be amended as follows:

Students who are delinquent and/or in default in any of their financial accounts with the college, the university or an appropriate state or federal agency for which the university acts as either a disbursing or certifying agent, and students who have not completed exit interviews as required by the Federal Perkins Loan Program, the federal Family Education Loan Programs, the William D. Ford Federal Direct Loan Program, and the Nursing Student Loan Program, are not to be permitted to complete registration, or issued a copy of their grades, a transcript of academic record, certificate, or degree, nor are they to receive funds under the federal campus-based student assistance programs or the federal Pell Grant Program unless the designated officer, in exceptional hardship cases and consistent with federal and state regulations, waives in writing the application of this regulation.

Freedom of Information Law Notice

Requests to inspect public records at the college under the Freedom of Information Law Notice, should be forwarded in writing to the Office of the Executive Counsel to the President at; The City College of New York, 160 Convent Avenue, Administration Building, Room 200, New York, NY 10031. Public records are available for inspection by appointment only at a location to be designated. You have the right to appeal any alleged denial of a request for access to records to: The City University of New York, Office of the General Counsel and Senior Vice Chancellor for Legal Affairs, 205 East 42nd Street, New York, NY, 10017. Copies of the CUNY procedures for access to public records and the appeal form are available at the reference desk of the library and the university website. <http://www.cuny.edu/about/administration/offices/la.html>

Special Provisions for Students in the Military

The following policies apply to students who leave CUNY to fulfill military obligations.

I. Students called up to the reserves or drafted before the end of the semester.

Grades. In order to obtain a grade, a student must attend 13 weeks (five weeks for summer session).

Refunds. A student called up to the reserves or drafted who does not attend for sufficient time to qualify for a grade is entitled to a 100% refund of tuition and all other fees except application fees.

II. Students who volunteer (enlist) for the military.

Grades. Same provision as for students called up to the reserves. In order to obtain a grade, a student must attend 13 weeks (five weeks for summer session).

Refunds. Students called to active duty who do not meet attendance requirements sufficient to earn a grade are entitled to a 100% refund of tuition and fees, except application fees. For students who enlist in the military, the amount of the refund depends upon whether the withdrawal is before the 5th week of classes. Students withdrawing prior to the beginning of the 5th week (3rd week in the Summer Session/Winter Session) are entitled to 100% refund of tuition and all fees except application fees. Students withdrawing after the 5th week (or the 3rd week for Summer Session/Winter Session) are entitled to a 50% refund of tuition and fees.

III. Other Provisions for Military Service:

Resident Tuition Rates. These lower rates are applicable to all members of the armed services, their spouses and their dependent children, on full-time active duty and stationed in the State of New York.

Re-enrollment of Veterans. Veterans who are returning students are given preferred treatment in the following ways:

Veterans who were former students with unsatisfactory scholastic records, may be readmitted with a probation program.

Veterans, upon their return, may register even after normal registration periods, without late fees.

Granting of college credit for military service and armed forces instructional courses.

Veterans returning too late to register may audit classes without charge.

Late Admissions. Veterans with no previous college experience are permitted to file applications up to the date of registration, and are allowed to begin classes pending completion of their application and provision of supporting documents.

Readmission Fee. Upon return from military service, a student will not be charged a Readmission Fee to register at the same college.

Veterans Tuition Deferrals. Veterans are entitled to defer the payment of tuition pending receipt of veterans' benefits.

New York National Guard Tuition Waivers. Active members of the New York National Guard, who are legal residents of New York State and who do not have a baccalaureate degree, are eligible for a tuition waiver for undergraduate study.

Immunization Requirements

New York State Public Health Law (PHL) 2165 requires that post-secondary students provide proof of immunity to measles, mumps and rubella (MMR) as a condition for attendance. The College reserves the right to prevent the registration of any applicant who fails to provide a record of immunization or who otherwise provides a health risk to the College community. It is University policy that all full-time and part-time students born on or after January 1, 1957, registered for six or more credits/ equivalent credits per semester must submit proof of MMR immunization. Students may be exempt from MMR immunization requirements for medical or religious reasons. Students must contact Student Health Services (SHS) to determine if they qualify for an exemption.

Public Health Law 2167 requires that post-secondary institutions provide written information about meningococcal meningitis to its students and that students complete, sign, and return a meningococcal meningitis response form regardless of how many credits they take in college. Public Health Law 2167 does not require that students be immunized against meningitis.

Students who do not submit proof of measles, mumps and rubella (MMR) immunization or who fail to return the meningococcal meningitis

response form within a statutory grace period shall be prohibited from attending the institution.

For additional information, you should contact Student Health Services located in Marshak Science Building (MR), Room J-15, at the following number (212) 650-8222.

Students may download immunization forms from the Student Health Services website:

Policy for web publication to the City College Main Website
The City College main website, managed by the Office of Communications and Marketing, is a forward facing information and marketing vehicle. Information published on the main college website is meant for the general public. Internal, administrative office information/applications or academic support content should be hosted on other college servers.

The City College main website is accessed via a content management system. Departments and offices manage the content of their respective office websites. Department heads/chairs appoint content editors to update content. While the Office of Communications and Marketing reviews the site frequently to ensure proper accessibility, all content posted by content editors or other individuals is the responsibility of those departments and those individuals given editing rights.

Though departments maintain their own content, the Office of Communications and Marketing reserves the right to delete/modify content where necessary. This is not the case with web sites or content on other web servers on campus.

Regarding websites for faculty, staff and students and their organizations – these may reside on campus servers external to the main website CMS if approved by the CCNY IT Department. In that case, the IT department and the particular party will be responsible for the content and maintenance of those sites. Other web servers managed by different groups around campus may have their own policies but the www.ccnycuny.edu URL cannot be used outside of the CMS of City College and the main site.

Any user or editor of the College CMS system or of other web servers on campus not abiding by the rules and regulations may be subject to limitations or eliminations of web privileges as well as other disciplinary actions.

Terms and Conditions of Use

Any person who uses the WWW facilities at City College consents to all of the provisions of this policy and agrees to comply with all of its terms and conditions and with all applicable local, state, and federal laws and regulations.

Any user of the WWW whose actions involving the WWW violate this, or any other College policy or regulation, may be subject to limitations or eliminations of WWW privileges as well as other disciplinary actions.

Policy Against Sexual Harassment

It is the policy of The City University of New York to promote a cooperative work and academic environment in which there exists mutual respect for all University students, faculty, and staff. Harassment of employees or students based upon sex is inconsistent with this objective and contrary to the University policy of equal employment and academic opportunity without regard to age, sex, sexual orientation, alienage or citizenship, religion, race, color, national or ethnic origin, handicap, and veteran or marital status. Sexual harassment is illegal under State, and City laws, and will not be tolerated within the University. For more information go to:

<https://www.ccnycuny.edu/safety/title-ix-sexual-assault-policy>

Procedures For Handling Student Complaints About Faculty Conduct In Academic Settings

I. Introduction. The University and its Colleges have a variety of procedures for dealing with student-related issues, including grade appeals, academic integrity violations, student discipline, disclosure of student records, student elections, sexual harassment complaints, disability accommodations, and discrimination. One area not generally covered by other procedures concerns student complaints about faculty conduct in the classroom or other formal academic settings. The University respects the academic freedom of the faculty and will not interfere with it as it relates to the content or style of teaching activities. Indeed, academic freedom is and should be of paramount importance. At the same time the University recognizes its responsibility to provide students with a procedure for addressing complaints about faculty treatment of students that are not protected by academic freedom and are not covered by other procedures. Examples might include incompetent or inefficient service, neglect of duty, physical or mental incapacity and conduct unbecoming a member of the staff.

II. Determination of Appropriate Procedure. If students have any question about the applicable procedure to follow for a particular complaint, they should consult with the chief student affairs officer. In particular, the chief student affairs officer should advise a student if some other procedure is applicable to the type of complaint the student has.

III. Informal Resolution. Students are encouraged to attempt to resolve complaints informally with the faculty member or to seek the assistance of the department chairperson or campus ombudsman to facilitate informal resolution.

IV. Formal Complaint. If the student does not pursue informal resolution, or if informal resolution is unsuccessful, the student may file a written complaint with the department chairperson or, if the chairperson is the subject of the complaint, with the academic dean or a senior faculty member designated by the college president. (This person will be referred to below as the Fact Finder.) Only students in a faculty member's class or present in another academic setting where the alleged conduct occurred may file complaints against that faculty member.

A. The complaint shall be filed within 30 calendar days of the alleged conduct unless there is good cause shown for delay, including but not limited to delay caused by an attempt at informal resolution. The complaint shall be as specific as possible in describing the conduct complained of.

B. The Fact Finder shall promptly send a copy to the faculty member about whom the complaint is made, along with a letter stating that the filing of the complaint does not imply that any wrongdoing has occurred and that a faculty member must not retaliate in any way against a student for having made a complaint. If either the student or the faculty member has reason to believe that the department chairperson may be biased or otherwise unable to deal with the complaint in a fair and objective manner, he or she may submit to the academic dean or the senior faculty member designated by the college president a written request stating the reasons for that belief; if the request appears to have merit, that person may, in his or her sole discretion, replace the department chairperson as the Fact Finder. The chairperson may also submit a written request for recusal for good cause to the academic dean or senior faculty member designated by the college president to review such requests. If a recusal request is granted, a different department chairperson shall conduct the investigation, or, if no other chairperson is available, an administrator designated by the college president shall serve in the chairperson's stead. Further, the college president may re-assign investigations as necessary, including but not limited to situations in which a Fact Finder has not completed an

investigation in a timely manner. In addition, during any time that no department chairperson is available to investigate a complaint, the college president may assign an administrator to investigate.

C. The Fact Finder shall meet with the complaining student and faculty member, either separately or together, to discuss the complaint and to try to resolve it. The Fact Finder may seek the assistance of the campus ombudsman or other appropriate person to facilitate informal resolution.

D. If resolution is not possible, and the Fact Finder concludes that the facts alleged by the student, taken as true and viewed in the light most favorable to the student, establish that the conduct complained of is clearly protected by academic freedom, he or she shall issue a written report dismissing the complaint and setting forth the reasons for dismissal and send a copy to the complaining student, the faculty member, the chief academic officer and the chief student affairs officer. Otherwise, the Fact Finder shall conduct an investigation. The Fact Finder shall separately interview the complaining student, the faculty member and other persons with relevant knowledge and information and shall also consult with the chief student affairs officer and, if appropriate, the college ombudsman. The Fact Finder shall not reveal the identity of the complaining student and the faculty member to others except to the extent necessary to conduct the investigation. If the Fact Finder believes it would be helpful, he or she may meet again with the student and faculty member after completing the investigation in an effort to resolve the matter. The complaining student and the faculty member shall have the right to have a representative (including a union representative, student government representative or attorney) present during the initial meeting, the interview and any post-investigation meeting.

E. In cases where there is strong preliminary evidence that a student's complaint is meritorious and that the student may suffer immediate and irreparable harm, the Fact Finder may provide appropriate interim relief to the complaining student pending the completion of the investigation. The affected faculty member may appeal such interim relief to the chief academic officer.

F. At the end of the investigation, the Fact Finder shall issue a written report setting forth his or her findings and recommendations, with particular focus on whether the conduct in question is protected by academic freedom, and send a copy to the complaining student, the faculty member, the chief academic officer and the chief student affairs officer. In ordinary cases, it is expected that the investigation and written report should be completed within 30 calendar days of the date the complaint was filed.

G. Appeals Procedure. If either the student or the faculty member is not satisfied with the report of the Fact Finder, the student or faculty member may file a written appeal to the chief academic officer within 10 calendar days of receiving the report, which time period may be extended for good cause shown. The chief academic officer shall convene and serve as the chairperson of an Appeals Committee, which shall also include the chief student affairs officer, two faculty members elected annually by the faculty council or senate and one student elected annually by the student senate. The Appeals Committee shall review the findings and recommendations of the report, with particular focus on whether the conduct in question is protected by academic freedom. The Appeals Committee shall not conduct a new factual investigation or overturn any factual findings contained in the report unless they are clearly erroneous. If the Appeals Committee decides to reverse the Fact Finder in a case where there has not been an investigation because the Fact Finder erroneously found that the alleged conduct was protected by academic freedom, it may remand to the Fact Finder for further proceedings. The committee shall issue a written decision within 20 calendar days of receiving the appeal. A copy of the decision shall be sent to the student, the faculty member, the department chairperson and the president.

H. Subsequent Action. Following the completion of these procedures, the appropriate college official shall decide the appropriate action, if any, to take. For example, the department chairperson may decide to

place a report in the faculty member's personnel file or the president may bring disciplinary charges against the faculty member. Disciplinary charges may also be brought in extremely serious cases even though the college has not completed the entire investigative process described above; in that case, the bringing of disciplinary charges shall automatically suspend that process. Any action taken by a college, whether interim or final, must comply with the bylaws of the University and the collective bargaining agreement between the University and the Professional Staff Congress.

I. Campus Implementation. Each campus shall implement these procedures and shall distribute them widely to administrators, faculty members and students and post them on the college website.

Approved by the Board of Trustees on April 26, 2010, effective May 1, 2010.

Policy 7.041 Drugs and Alcohol

The City University of New York ("CUNY") is an institution committed to promoting the physical, intellectual, and social development of all individuals. As such, CUNY seeks to prevent the abuse of drugs and alcohol, which can adversely impact performance and threaten the health and safety of students, employees, their families, and the general public. CUNY complies with all federal, state, and local laws concerning the unlawful possession, use, and distribution of drugs and alcohol.

Federal law requires that CUNY adopt and implement a program to prevent the use of illicit drugs and abuse of alcohol by students and employees. As part of its program, CUNY has adopted this policy, which sets forth (1) the standards of conduct that students and employees are expected to follow; (2) CUNY sanctions for the violation of this policy; and (3) responsibilities of the CUNY colleges/units in enforcing this policy. CUNY's policy also (1) sets forth the procedures for disseminating the policy, as well as information about the health risks of illegal drug and alcohol use, criminal sanctions for such use, and available counseling, treatment, or rehabilitation programs, to students and employees; and (2) requires each college to conduct a biennial review of drug and alcohol use and prevention on its campus.

This policy applies to all CUNY students, employees and visitors when they are on CUNY property, including CUNY residence halls, as well as when they are engaged in any CUNY-sponsored activities off campus.

1 Standards of Conduct

The unlawful manufacture, distribution, dispensation, possession, or use of drugs or alcohol by anyone, on CUNY property (including CUNY residence halls), in CUNY buses or vans, or at CUNY-sponsored activities, is prohibited. In addition, CUNY employees are prohibited from illegally providing drugs or alcohol to CUNY students. Finally, no student may possess or consume alcoholic beverages in any CUNY residence hall, regardless of whether the student is of lawful age, except for students living in the Graduate School and University Center's graduate housing facilities who may lawfully possess and consume alcoholic beverages. For purposes of this policy, a CUNY residence hall means a residence hall owned and/or operated by CUNY, or operated by a private management company on CUNY's behalf.

In order to make informed choices about the use of drugs and alcohol, CUNY students and employees are expected to familiarize themselves with the information provided by CUNY about the physiological, psychological, and social consequences of substance abuse.

2 Sanctions

Employees and students who violate this policy are subject to sanctions under University policies, procedures and collective bargaining agreements, as described below. Employees and

students should be aware that, in addition to these CUNY sanctions, the University will contact appropriate law enforcement agencies if they believe that a violation of the policy should also be treated as a criminal matter.

3 Students

Students are expected to comply with the CUNY and college policies with respect to drugs and alcohol. Any student found in violation may be subject to disciplinary action under Article 15 of the Bylaws of the Board of Trustees, which may result in sanctions up to and including expulsion from the University.

In addition, any student who resides in a CUNY residence hall and who is found to have violated any CUNY or college policy with respect to drugs and alcohol may be subject to sanctions under the CUNY Residence Hall Disciplinary Procedures, up to and including expulsion from the residence hall.

In lieu of formal disciplinary action, CUNY may, in appropriate cases, seek to resolve the matter through an agreement pursuant to which the student must see a counselor or successfully participate in a drug and alcohol treatment program.

In accordance with the Federal Educational Rights and Privacy Act ("FERPA"), CUNY may also choose—when appropriate—to contact parents or legal guardians of students who have violated the CUNY policy on drugs and alcohol.

4 Employees

Any employee found to have violated this CUNY policy may be subject to disciplinary action, in accordance with the procedures set forth in applicable CUNY policies, rules, regulations, and collective bargaining agreements. Sanctions may include a reprimand, suspension without pay, or termination of employment. In lieu of formal disciplinary action, CUNY may, in appropriate cases, seek to resolve the matter through an agreement pursuant to which the employee must successfully participate in a drug or alcohol treatment program.

5 Responsibilities of Colleges/Units

Each college or unit of the University should make its best efforts to educate employees and students about this policy and the risks associated with the unlawful possession, use, or distribution of illegal drugs and alcohol. The President of each college or unit may choose to ban alcohol at on-campus functions or at any particular function. This policy, together with information about the health risks of illegal drug and alcohol use, criminal sanctions for such use, and counseling, treatment, or rehabilitation programs available to employees or students, must be distributed annually to all employees and students. The Chief Student Affairs Officer shall be responsible for the distribution of this material to students, and the Director of Human Resources shall be responsible for the distribution of the material to employees.

The Vice President for Administration, or person performing the equivalent function at each college or unit of CUNY, shall be responsible for conducting a biennial review to determine the effectiveness of CUNY's drug and alcohol program at its college or unit, and to ensure that sanctions for drug and alcohol violations are consistently enforced. Upon completion, the biennial review must be sent to the University's Executive Vice Chancellor and Chief Operating Officer. This biennial review must include the number of drug and alcohol-related violations and fatalities that occur on the college's campus or as part of the college's activities, as well as the number and type of sanctions imposed as a result of drug and alcohol-related violations and fatalities that occur at the college as part of its activities.

(Board of Trustees Minutes, 2009,06-22,7,A. Amended: Board of Trustees Minutes, 2011,05-02,5,A)

If you are experiencing difficulty with alcohol or chemical dependency City College can help you find counseling services or rehabilitation programs that will help you with your problem.

Counseling Services available at City College can be had by contacting the Counseling Center: MR J-15 212-650-8222, <http://www.cuny.cuny.edu/counseling/community-resources.cfm>

Appendix B

The City University of New York Board Of Trustees

William C. Thompson, Jr.
Chairman of the Board

Members Of The Board

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Una S. T-Clarke
Lorraine Cortés-Vázquez
Rita Dimartino
Fernando Ferrer
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Robert F. Mujica
Brian D. Obergfell
Jill O'donnell-Tormey
Charles A. Shorter
Ken Sunshine
Sandra Wilkin
Chika Onyejiukwa
Katherine M. Conway

<http://www.cuny.edu/about/trustees/board.html>

Appendix C

Officers of the Administration

Vincent Boudreau

Interim
B.A., M.A., Ph.D.

Maurizio Trevisan

Anna & Irving Brodsky Medical Professor
Dean of The CUNY Medical School
M.S., M.D.

Michele Baptiste

Dean, Diversity and Compliance
J.D.

Gilda Barabino

Dean, Grove School of Engineering
B.S., Ph.D.

E. Maudette Brownlee

Director, Special Programs/SEEK
B.A., Ph.D.

Doris Cintrón

Senior Associate Provost for Academic Affairs, Assessment, and Accreditation
Ed.D.

Mary Driscoll

Interim Senior VP & Provost
B.A., M.A., Ed.D.

Gretchen Johnson

Interim Dean of Education
B.S., M.S., Ph.D.

Erica Friedman

Deputy Dean of Sophie Davis
B.S., M.D.

Deidra Hill

Vice President for Communications
B.A.

Theresa Horvath

Assistant Dean of PA Program – Sophie Davis
B.S., M.D.

Eric Koch

Dean of Humanities & Arts
B.A., M.Phil., Ph.D.

Felix Lam

Vice President of Finance and C.F.O.
B.A., M.P.A.

Tony Liss

Dean, Division of Science
B.A., M.S., Ph.D.

Celia P. Lloyd

Assistant VP for CUNYfirst Integration
B.S., M.B.A.

Jeffrey Machi

Vice President for Development and Institutional Advancement
B.A.

Karen Mackey-Witherspoon

Vice President for Government, Community, and Cultural Affairs
B.A.

Laurent Mars

Associate Dean of Science
M.S., Ph.D.

Dani McBeth

Associate Dean for Student Affairs, Sophie Davis School of Biomedical Education
Ph.D.

Juan Carlos Mercado

Dean, Division of Interdisciplinary Arts and Sciences/Center for Worker Education
B.A., M.A., Ph.D.

Paul Occhiogrosso

Executive Counsel to the President
J.D.

Leonardo Leon

Deputy Chief Information Officer
B.S. and M.S.

Gordon Gebert

Acting Dean, School of Architecture
B. Architecture, M. Architecture, R.A.

Kevin R. Foster

Interim Dean, Division of The Colin Powell School for Civic and Global Leadership
B.A., M.A., Ph.D.

David Robinson

Assistant Vice President for Campus Planning and Facilities Management
B.S.

John Siderakis

Assistant Vice President for Human Resources
B.S., M.B.A.

Charles Stewart

Associate Dean and Chief Librarian
B.A., M.A., M.L.S.

Mary Ruth Strzeszewski

Associate Provost for Academic Services
Ph.D.

Wendy Thornton

Assistant Dean for Student Affairs
M.A.

Ashiwel Undieh

Associate Provost for Research
Ph.D.

Ardie D. Walser

Associate Dean of Academic Affairs for Graduate & Undergraduate
Studies,
Executive Officer, Graduate Center of CUNY
B.E., M.E., Ph.D.

Institutional Policies

Academic Integrity

(CCNY Policies)

Campus and Workplace Violence Policy

Computer Use

CUNY Board of Trustees By-Laws

CUNY Policy on Admission of Students Who May Pose a Risk to the College

(p. 146)

CUNY Policy on Sexual Misconduct

Drug/Alcohol Use - Amnesty Policy

Equal Opportunity and Non-Discrimination

FERPA

Freedom of Information Law (FOIL)

Health Statement and Immunization Requirements (p. 146)

Immunization Requirements

Information Security

Policy Against Drugs and Alcohol

Reasonable Accommodations and Academic Adjustments

Returning from/Leaving for Active Duty

Rules and Regulations for the Maintenance of Public Order Pursuant to Article 129-A of the Education Law (Henderson Rules)

Student Complaints about Faculty Conduct in Academic Settings

Students' Bill of Rights

(p. 313)

(p. 313)

Undergraduate Degree Programs (p. 313)

Undergraduate Degree Programs

Approved Undergraduate Degree Programs			<i>The College of Liberal Arts and Science</i>		Hegis Code
<i>The College of Liberal Arts and Science</i>					
		Hegis Code			
American Studies	B.A.	0313.00	Psychology	B.A.,B.S.,B.A./M.A.	2001.00
Anthropology	B.A.	2202.00	Publishing	Certificate	5008.00
Area Studies—Asian-Latin American & Latino-Russian	B.A.	0399.00	Romance Languages-French, Italian, Spanish	B.A.	1101.00
Area Studies—Black-Puerto Rican-Jewish	B.A.	0399.00	Sociology	B.A.,B.A./M.A	2208.00
Art	B.A.	1002.00	Theatre	B.A.	1007.00
Biochemistry	B.S.	1905.00	Urban Legal Studies	B.A.	2299.00
Biology	B.S., B.S./M.S.	0401.00	<i>The School of Architecture</i>		
Biology/Optometry	B.S./O.D.	0401.00/1209.00	Architecture	B. Arch., B.S.	0202.00
Biotechnology	B.S.	0499.00	<i>The School of Education</i>		
Chemistry	B.S., B.S./M.S.	1905.00	Art Education "K-12"	B.A.	0831.00
Communications	B.A.	0601.00	Bilingual Childhood Education	B.S. Ed	0899.00
Comparative Literature	B.A.	1503.00	Childhood Education	B.S. Ed	0802.00
Economics	B.A.B.A/M.A	2204.00	Early Childhood Education	B.S.	0823.00
English	B.A.	1501.00	Music Education "K-12"	B.F.A.	0832.00
Environmental Earth System Science	B.S.	1917.00	<i>The Grove School of Engineering</i>		
Electronic Design and Multimedia	B.F.A.	0605.00	Biomedical Engineering	B.E.	0905.00
Film	B.F.A.	1010.00	Chemical Engineering	B.E.	0906.00
Geology	B.A., B.S.	1914.00	Civil Engineering	B.E.	0908.00
History	B.A.,B.A./M.A	2205.00	Computer Engineering	B.E.	0999.00
Interdisciplinary Liberal Arts and Science	B.A., B.S.	4901.00	Computer Science	B.S.	0701.00
International Studies	B.A.	2210.00	Electrical Engineering	B.E	0909.00
Management and Administration	B.A.	0506.00	Earth System Science and Environmental Engineering	B.E.	0922.00
Mathematics	B.A.,B.S,B.A./M.A.	1701.00	Mechanical Engineering	B.E.	0910.00
Math in Scientific And Industrial Application	B.S.	1703.00	<i>The School of Biomedical Education</i>		
Music	B.A., B.F.A.	1005.00,1004.00	Biomedical Science	B.S.	0499.00
Philosophy	B.A.	1509.00	Physician's Assistant Program	B.S.	1299.10
Physics	B.A., B.S.	1902.00			
Political Science	B.A.	2207.00			
Pre-Law	B.A.	4903.00			

Directions to the City College Campus

<http://www.ccny.cuny.edu/about/directions.cfm>

By Train

Take the **IRT #1** local to 137th Street and Broadway. Walk up 138th Street three blocks to Convent Avenue.

Take the **IND "A" or "D" express or "B" or "C"** local to 145th Street and St. Nicholas Avenue, walk west one block to 145th Street and Convent Avenue, then south to 138th Street. The CCNY shuttle bus makes regular stops to this subway during the day.

Take the **IRT #4 or #5 express or #6 local** to 125th Street and Lexington Avenue. Change there for the M-100 or M-101 bus to Amsterdam Avenue and 138th Street. Walk east one block to Convent Avenue.

Take the Metro North to 125th Street and Park Avenue. Change there for the M-100 or M-101 bus to Amsterdam Avenue and 138th Street, walk east one block to Convent Avenue.

By Bus

Take the **M-4 or M-5** to Broadway and 137th Street. Walk up 138th Street three blocks to Convent Avenue.

Take the **M-100 or M-101** to Amsterdam Avenue and 138th Street, walk east one block to Convent Avenue.

Take the **M-101** to 135th Street and Amsterdam Avenue and walk north to 138th Street, then east one block to Convent Avenue.

Take the **BX-19** to 145th Street and Convent Avenue, walk south on Convent Avenue to 138th Street.

By Car

From the West Side Highway: Exit at 125th Street. Cross Broadway and turn left onto Amsterdam Avenue. The College is at 138th Street and Amsterdam Avenue.

From the East Side: Take the FDR or the RFK (Triborough) Bridge to Harlem River Drive. Exit at 135th Street. Continue to St. Nicholas Avenue and turn right, then left onto 141st Street. Turn left onto Convent Avenue. The campus begins at 140th Street and Convent Avenue.

Please note that visitor parking on campus is extremely limited and must be arranged in advance through the Office of Public Safety, (212-650-6911) or the City College Office organizing the public event. Parking is available in the neighborhood.

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