

**QUANTITATIVE AND PSYCHOMETRIC METHODS
ADVANCED STRAND HANDBOOK**

MARCH 2017

Table of Contents

OVERVIEW4

GENERAL GUIDANCE4

 Training4

 Financial Support5

 Time Commitment6

 Major Advisor6

 Advisory Committee6

COURSE REQUIREMENTS6

 General Notes7

 Common Research Methods and Statistics Core7

 Interdisciplinary Core.....7

 Quantitative and Psychometric Methods (QPM) Core8

 Qualifying Examination and Dissertation Research9

 Internship.....9

PROGRAM MILESTONES9

 Qualifying Examination10

 Institutional Review Board (IRB)11

 Dissertation Proposal.....11

 Doctoral Dissertation12

PROGRESS MONITORING.....13

 Course Consulting13

 Problem Solving13

 Record Keeping14

 Committee Meeting14

 Annual Review14

PRACTICAL RESOURCES15

 Deadlines15

 Writing.....15

 University of Kentucky Office of Research Integrity15

College of Education Office of Information Systems	16
Other Resources	16

REQUIREMENTS FOR DOCTORAL STUDENTS IN THE QUANTITATIVE AND PSYCHOMETRIC METHODS PROGRAM

OVERVIEW

The Quantitative and Psychometric Methods (QPM) program is an advanced strand under the Interdisciplinary PhD in Education Sciences housed in the College of Education. The QPM program is jointly hosted by the Department of Educational Policy Studies and Evaluation (EPE) and the Department of Educational, School, and Counseling Psychology (EDP). Doctoral students are typically admitted to a specific department as their home department from which they receive program supports of all kinds. A common set of core requirements applies, regardless of departmental affiliation. Students must meet these core requirements for the completion of the QPM program in either department.

This handbook intends to provide essential information for doctoral students in the QPM program, including general guidance, course requirements, program milestones, progression monitoring, and practical resources. The development of such an integrated program is an evolving process, and this handbook is periodically reviewed and updated. The current handbook is applicable to all students who enter the QPM program as first-year students in the spring 2017 or subsequent years.

GENERAL GUIDANCE

Training

The primary objective of the QPM program is to promote the development of advanced quantitative and psychometric knowledge and skills that allow graduates to function as independent researchers or scientists who can lead research design and data analysis for all kinds of empirical purposes. To achieve this objective, the QPM program emphasizes the development of quantitative and psychometric expertise; research, consulting, and teaching capacity; and quantitative and psychometric communication skills. Faculty members and doctoral students in the QPM program are each associated with at least one of two specialty areas of quantitative methods and psychometric methods. QPM students are expected to become involved in research and development to build a strong foundation for continuing contributions to policies and practices in applied fields.

Faculty members strive to help doctoral students experience the demands and challenges in both post-doctoral and employment settings. Faculty members in the QPM program emphasize the so-called “apprenticeship model” to train doctoral students, a unique one-on-one strategy used to guide the students through academic challenges. This mentoring practice is embedded in all phases of students’ programs, from coursework to dissertations.

Commonly, a QPM doctoral student will work with one primary advisor, often referred to as the major advisor, throughout her or his program. However, academic supervision involving two advisors (i.e., co-advisors) is possible to emphasize the interdisciplinary nature of quantitative and psychometric methods; especially in cases where advanced quantitative or psychometric

methods are applied substantially to critical real-world issues. In addition, any student may change their major advisor as his or her research interests evolve. In such cases, it is expected that the student, current faculty mentor, and new faculty mentor are in communication regularly about this change.

It is expected that the majority of the graduates of the QPM graduates will pursue careers involving some degree of teaching. Faculty members strive to create paid and volunteering opportunities (i.e., teaching assistants) for doctoral students that involve teaching. It is also expected that the majority of the graduates will engage in careers that require some degree of quantitative and psychometric consulting. Faculty members also strive to create paid and volunteering opportunities (i.e., student consultants) for students to provide independent quantitative and psychometric consulting services to graduate students and faculty members, particularly in the College of Education.

Financial Support

Faculty members strive to provide financial support for all QPM doctoral students. Possibilities include fellowships and scholarships provided by the University of Kentucky and the College of Education, research assistantships on funded research projects, stipends made available by consulting services, and teaching assistantships. Most financial supports provide a monetary stipend in addition to tuition remission and health benefits, contingent on good academic standing and sound job performance.

Another resource of financial support, particularly for senior doctoral students, comes from the students themselves who are generally encouraged during their senior years to write and submit a grant or contract proposal to help support their dissertation research. The University of Kentucky and the College of Education provide some small grants to support research by graduate students. Public (state and federal) institutions and private foundations are external resources. The students are encouraged to work with their advisory committees to identify appropriate funding resources and develop and submit applications. The University of Kentucky and the College of Education have offices that provide assistance for the preparation of grant applications. Support information can be obtained from the students' advisory committees.

In addition, full or partial funds to facilitate conference travel for the presentation of doctoral students' research are available from the home department, the College of Education, and the Graduate School. The home department typically covers the cost of producing conference materials for demonstration and distribution (e.g., posters). Staff members in the home department typically provide assistance for travel reimbursement when applicable.

Time Commitment

QPM doctoral students are generally expected to complete a minimum of 36 hours of coursework to advance to qualifying examinations and doctoral candidacy. To maintain a full-time graduate student status, the University of Kentucky requires doctoral students to take a minimum of nine hours each academic semester. Therefore, most students in the QPM program take at least two years to complete required coursework. After the successful completion of coursework, students move on to qualifying examinations, dissertation proposal defense, and oral dissertation defense, which is expected to take at least one year to complete. In general, it is expected that each QPM student will need about three years of graduate study to obtain a PhD degree, but this timeframe could be shortened or extended depending on the student.

Major Advisor

A major advisor is selected for each doctoral student at the time of admission into the QPM program, unless the student has indicated in their application materials their preferred advisor. The advisor has the main responsibility of supervising the student from coursework to dissertation. Although the majority of QPM students work with the same major advisor throughout their programs, a change of major advisor and/or co-advisor is possible under special circumstances. However, each student should make every effort to avoid a change of major advisor once they reach their doctoral candidacy. A change at such a late stage may need the approval of the Director of Graduate Studies, the restructuring of the advisory committee, and possibly the retaking of the qualifying examination, if research orientations have changed substantially.

Advisory Committee

An advisory committee is typically formed during the first year of study of a QPM doctoral student's program and consists of the major advisor with three additional faculty members (i.e., committee members). At least one of these additional faculty members must come from the QPM program. In pursuit of interdisciplinary collaboration related to QPM, one member may come from highly-related academic areas such as mathematics, statistics, and economics. A QPM doctoral student is expected to consult with his or her major advisor to establish the advisory committee during the first year of the program. Committee members are changeable during the course of the program, if both the student and major advisor agree on sufficient reasons to do so.

COURSE REQUIREMENTS

The Graduate School publishes a complete list of graduate courses annually. Specific courses to be offered in a given academic year are made available online prior to each semester. At the present time, courses offered in the Department of Educational Policy Studies and Evaluation and the Department of Educational, School, and Counseling Psychology are both relevant to the QPM program. When a specific course is offered, it contains both the course number and the department in which it is to be taught (EPE = Educational Policy Studies and Evaluation; EDP = Educational, School, and Counseling Psychology). Many QPM courses are cross-listed between

these two departments (EPE/EDP or EDP/EPE). QPM doctoral students can enroll in either EPE or EDP sections.

The University of Kentucky uses a letter grade system for evaluation of course performance. A QPM doctoral student must attain a grade of B or higher to receive credit for the completion of QPM course requirements.

Coursework requirements applicable to all QPM doctoral students are as follows.

General Notes

- A course may only count towards one core, double counting is generally not allowable.
- A course may be replaced or substituted upon the approval of the advisory committee.
- A grade of B or higher must be earned in all courses, with a maximum of three B's in courses counted toward the QPM degree.
- A maximum of 6 hours at the 500 level can be counted towards the PhD degree.

Common Research Methods and Statistics Core (12 hours)

Group A: Quantitative Courses (3-6 hours)	
EDP 656	Methodology of Educational Research
EDP/EPE 660	Research Design and Analysis in Education
EDP/EPE 707	Multivariate Analysis in Educational Research
EPE 619	Survey Research
ANT/EDP/EPE 620 or SOC 622	Introduction to Evaluation
ANT/EDP/EPE 621	Advanced Methods in Evaluation
EDP/EPE 679	Introduction to Measurement Theory & Techniques
Group B: Qualitative Courses (3-6 hours)	
EPE 663	Field Studies in Educational Settings
EPE 763	Advanced Topics and Methods of Evaluation
EPE 669	Oral History
Group C: Advanced Course (3 hours) determined by the advisory committee (course needs to be either quantitative or psychometric as approved by the student's advisory committee)	

Note. Groups A + B must be taken for a combined total of 9 hours with a minimum of 3 hours in each group.

Interdisciplinary Core (6 hours)

EDP 548	Educational Psychology
EDP 600	Human Lifespan Development
EDP 603	Human Cognitive Development
EDP 610	Theories of Learning in Education
EDP 614	Motivation and Learning
EDP 616	Multicultural Psychology
EPE 555	Comparative Education

EPE 602	Social Policy Issues in Education
EPE 670	Policy Issues in Higher Education
EPE 678	Economics of Higher Education
EPE 797	Historical Research on Education
EPE 798	Diversity in Higher Education

Quantitative and Psychometric Methods (QPM) Core

- 18 additional hours of QPM courses are required beyond the Common Research Methods and Statistics Core.
- Students need to specify primary emphasis as either quantitative methods or psychometric methods.
- Courses may be substituted based on the approval of the advisory committee.

Primary Emphasis	
Group A: Quantitative Methods (at least 12 hours for primary emphasis)	
EDP/EPE 660	Research Design and Analysis in Education
EDP/EPE 707	Multivariate Analysis in Educational Research
EDP/EPE 711	Advanced Quantitative Methods (can be repeated up to 12 hours with a minimum 6 hours)
EDP 778 or EPE 773	Seminar (appropriate to Quantitative Methods) (can be repeated up to a maximum of 6 hours)
EDP 782 or EPE 785	Independent Study (can be repeated up to a maximum of 6 hours)
EDP 708 or EPE 790	Internship
Group B: Psychometric Methods (at least 12 hours for primary emphasis)	
EDP/EPE/EDC 522	Psychological & Educational Tests & Measurement
EDP/EPE 679	Introduction to Measurement Theory & Techniques
EDP/EPE 712	Advanced Psychometric Methods (can be repeated up to 12 hours with a minimum 6 hours)
EPE 773/EDP 778	Seminar (appropriate to Psychometric Methods) (can be repeated up to a maximum of 6 hours)
EDP 782/EPE 785	Independent Study (can be repeated up to a maximum of 6 hours)
EDP 708/EPE 790	Internship

Qualifying Examination and Dissertation Research

Note: Two hours per academic semester, repeat as needed

QPM doctoral students with prior graduate experience from other institutions may transfer up to nine hours of graduate course credits according to University of Kentucky Graduate School regulations. Courses taken five years or more earlier cannot be transferred. Course transfers require approval by the advisory committee and the Director of Graduate Studies, who oversees the QPM program. Students should prepare documentation in as much detail as possible about the courses to be transferred (e.g., course syllabi, assignments, and examinations).

Internship

All QPM doctoral students are encouraged, but not required, to complete an internship involving quantitative and/or psychometric practices. Specifically, the students are expected to complete the following:

- find an internship opportunity in any institution either on or off campus where quantitative and/or psychometric analysis is a routine practice (e.g., a school district, a testing company, a state organization).
- seek approval for the potential internship by QPM faculty prior to registering for the internship.
- register the internship (EDP 708/EPE 790) as part of the QPM coursework.
- ensure the time commitment is equivalent to three hours of coursework and document quantitative and/or psychometric tasks undertaken.
- obtain a letter from the internship institution that verifies the hours and tasks of the implemented internship.

Internships normally should be considered near the completion of required coursework, when QPM doctoral students have acquired sufficient quantitative and psychometric knowledge and skills. Internships can occur during an academic or summer months and can go beyond one semester; however, when internships extend beyond one semester, they can still only be taken for up to three credit hours.

PROGRAM MILESTONES

There are several program milestones that serve to promote and ensure QPM doctoral students' completion of the program. Specific milestones for the QPM program include the following:

1. Formation of an advisory committee
2. Completion of coursework requirement
3. Passing of a qualifying examination, to advance to doctoral candidacy
4. Approval of IRB (Institutional Review Board) for research with human subjects, if applicable
5. Successful defense of a doctoral dissertation proposal, to advance to dissertation

research

6. Successful passing of an oral dissertation defense, to receive the PhD degree

These milestones are often accompanied by meetings of oral defense in nature. QPM doctoral students should make their best effort to avoid scheduling these meetings during summer months.

QPM doctoral students in their third year and beyond, who have not passed their qualifying examinations, must present plans to pass their qualifying examinations, along with reasonable excuses, to their advisory committees. If students have completed their required courses, but have not completed their qualifying examination, they cannot register from EDP/EPE 767 (Dissertation Residency Credit). Registration in EDP/EPE 767 without completing a qualifying examination is a violation of the Graduate School regulations.

Qualifying Examination

After successful completion of required coursework, a QPM doctoral student proceeds to the qualifying examination. The purpose of the exam is to evaluate the student's knowledge and skills in QPM, to assess familiarity with published literature on the student's topic of interest, and to determine whether the student is prepared to advance to doctoral candidacy. Typically, the qualifying examination is taken at the beginning of the third year.

The advisory committee is responsible for conducting the qualifying examination. Typically, a doctoral student will work with the major advisor to produce a "mini" proposal outlining the research purpose and method. Committee members then construct questions according to the purpose and method. The major advisor is responsible for ensuring that the questions cover the breadth and depth of the topic. The student is *typically* given 6 weeks to respond to the questions during which period the student can only ask for clarifications of specific issues related to the questions. The student provides the written qualifying examination to the members of the advisory committee for evaluation; meanwhile, a meeting for an oral examination with the advisory committee is scheduled. This oral examination focuses on the written responses, with members asking for clarifications, reflections, and extensions. The student should expect approximately two hours for this oral examination. At the end of the oral examination, the committee votes on the qualification and performance of the student. The possible options for the committee votes include the following:

- Pass (the student advances to doctoral candidacy and begins to prepare a dissertation proposal)
- Fail (the student retakes the qualifying examination one more time only or prepares to withdraw from the program)

Institutional Review Board (IRB)

QPM doctoral students whose dissertation research involves direct interactions with human subjects must obtain approval from the Institutional Review Board (IRB) at the University of

Kentucky. The students may also need to obtain approval from relevant institutions where experiments and data collections are to be carried out.

QPM doctoral students who intend to pursue secondary data analysis, which does not involve direct interactions with human subjects, must obtain an exemption certificate from the IRB through an expedited process.

QPM doctoral students who plan to conduct a simulation study in their dissertation research do not need to pursue any IRB approval.

It often takes considerable time to obtain an IRB approval, especially when revisions are required. QPM doctoral students are encouraged to apply for IRB approval as early as possible, once approved by the student's major advisor. Students also need to pay close attention to any conditions on their IRB approval letters. Some IRB protocols need to be renewed yearly. It is the students' responsibility to ensure that their IRB protocol is up to date during the course of their dissertation research.

University of Kentucky Office of Research Integrity

QPM doctoral students are required to take a short online training course on the ethical treatment of human subjects through the Office of Research Integrity (<http://www.research.uky.edu/ori/>), even though not all students need a full IRB review. Students are expected to check with the Office of Research Integrity for an official answer on whether and what IRB approval is needed for their particular research.

Dissertation Proposal

A QPM doctoral student first should work with his or her major advisor to determine the format of the dissertation. In general, there are two ways to write a dissertation.

- A traditional dissertation usually contains five chapters of introduction, literature review, method, results, and discussion.
- A multiple-manuscript dissertation often contains multiple individual papers carefully arranged around a common theme. In this case, the dissertation often includes a chapter of introduction, several chapters of individual studies (following academic article format), and a final chapter of discussion. It is expected that each paper is independent of one another so that results from one paper do not hinder the start of the other paper.

The way a dissertation proposal is constructed depends on the format of the final dissertation.

Once a QPM doctoral student and his or her major advisor reach an agreement on the dissertation format, the student starts to write the dissertation proposal. Students who pursue a traditional dissertation need to present the first three (full) chapters as their proposal. Those who work with a multiple-manuscript dissertation need to plan on the specific content of their proposal with their major advisor. In either case, the process of writing a proposal may take several months, and the student should expect multiple revisions before approval by their major advisor for

submission to the advisory committee. Typically, a proposal needs to be prepared in such a way that it requires only minor revisions from other members of the advisory committee.

Once a dissertation proposal is submitted to the advisory committee, a doctoral student needs to arrange a meeting (i.e., proposal defense) of the advisory committee to examine and approve the proposal. Student should avoid scheduling the meeting during summer months. Typically, the student should allow at least two weeks for each committee member to examine the proposal before the meeting takes place. The student also should expect approximately two hours for the proposal defense. During the meeting, the student makes a brief presentation, and the members ask questions and suggest improvements. At the end of the meeting, the committee determines whether the student can carry out the planned dissertation research. The student needs to address any substantial issues raised by any member by revising relevant parts of the proposal. Typically, the resulting proposal carries over to the final dissertation as (approved) chapters.

A dissertation proposal meeting (defense) is open to the public. However, only members of an advisory committee are present during the deliberation concerning a doctoral student's proposal.

Doctoral Dissertation

Working with the major advisor, a doctoral student carries out dissertation research and writes the remaining chapters of a dissertation. There may be times when significant changes to the proposed research must be made (e.g., cancellation of experiment or data collection under new leadership in a certain institution, initial studies are not fruitful as predicted). The student should work with the major advisor to plan any significant changes and notify the advisory committee members of the need for changes and receives approval. Approval of changes to doctoral proposals can be reached via email or by other means of communication deemed appropriate (e.g., via Zoom, Skype). When deemed necessary by a majority of the advisory committee, there may be a meeting or meetings for the approval of changes.

A doctoral student should expect multiple revisions before the major advisor believes the student (candidate) has prepared an acceptable draft of the dissertation. Once the major advisor approves the dissertation, the student submits the dissertation to the advisory committee members and schedules a meeting for the oral defense of the dissertation. The student should avoid scheduling the meeting during summer months. Typically, the student should allow at least two weeks for each committee member to examine the dissertation before the oral defense takes place.

A formal oral defense is open to the public, and faculty members and graduate students in relevant departments are invited to attend. The student is responsible for circulating published notice of the defense to appropriate faculty members and graduate students.

Typically, the oral defense begins with a presentation of the conceptual and methodological basis for the study or studies by a doctoral student. After the presentation, the advisory committee members ask questions and stimulate discussions about various issues related to the dissertation research. The student should expect approximately two hours for the oral defense.

At the end of the oral examination, the advisory committee members vote on the quality of the

dissertation and the performance of the candidate. Only members of an advisory committee are present during the final deliberation concerning a doctoral student's performance in written and oral examination. The possible voting options for the committee include the following:

- Pass (the student may need to undertake some remediation on certain parts of the dissertation but there is no need for another oral examination)
- Fail (the student may need to carry out substantial revision and come before the advisory committee for another oral examination)

After passing the oral dissertation defense and attending to possible remediation on certain parts of the dissertation, a doctoral student must prepare (format) the final dissertation in a publication style (e.g., APA = American Psychological Association) approved by the Graduate School for the final submission of the dissertation to the University of Kentucky. This marks the completion of the QPM program.

According to the Graduate School regulations, a doctoral dissertation must be completed with a successful oral defense within five years after a doctoral student has passed the qualifying examination. After this period, upon petition to the Graduate School by the Director of Graduate Studies, who oversees the QPM program, some extension of candidacy may be granted by the Graduate School. If the allotted time expires without the student completing the dissertation defense, the student may need to apply for re-admission if s/he still intends to complete the program.

PROGRESS MONITORING

Although it is a joint responsibility between the major advisor and the doctoral student to monitor the academic progress of the student in the QPM program, the student plays a key role in this critical process. The student should facilitate the monitoring effort.

Coursework Consulting

QPM doctoral students should consult with their major advisor and committee members on coursework prior to registration of courses for each semester. The fact that quantitative and psychometric courses are highly sequential in terms of knowledge and skills makes this consultation important to avoid sometimes costly mistakes.

Problem Solving

Unpredictable issues may occur for a QPM doctoral student during the course of the program. When unexpected circumstances occur, students should discuss them with their major advisors as soon as possible. These problem solving sessions between the student and their major advisor often produce fruitful next-steps towards the resolution of unexpected difficulties.

Record Keeping

QPM doctoral students are expected to keep detailed academic records as a way to self-monitor their academic progress and to keep members of their advisory committees informed of their academic progress. Records should include events related to the QPM program that have taken place during each semester such as courses enrolled (including course performance), talks attended (e.g., academic talks, talks given by job applicants), teaching assignments, research projects, services provided (e.g., consultation), presentations made, publications attempted (i.e., acceptance, under review, under construction), grant (contract) applications (i.e., successful, under review, unsuccessful), and any other information of events that indicate academic engagement.

Meanwhile, QPM doctoral students can expect their major advisors and advisory committees to also facilitate the monitoring effort.

Committee Meeting

During the course of the QPM program, the major advisor, working with their doctoral student, initiate at least four committee meetings, including

1. Initial program meeting (getting to know one another, discussing potential dissertation research topics, and planning advanced coursework accordingly)
2. Qualifying examination meeting
3. Dissertation proposal (defense) meeting
4. Oral dissertation defense meeting

Additional committee meetings can always be arranged to discuss special issues. These meetings are arranged at the discretion of doctoral students and their major advisors; however, students should avoid calling committee meetings during summer months except in case of an emergency.

Annual Review

QPM doctoral students are reviewed at least once a year by faculty members in their home department. This annual review usually takes place in April near the end of the academic year. Accurate record keeping by the students facilitates this annual review. Students do not need to be present at the annual review meeting. Major advisors are expected to provide feedback in writing on the academic progress of their students after the meeting. When necessary, major advisors should also provide constructive suggestions on areas in need of improvement.

A progress sheet for monitoring purposes is provided to all QPM doctoral students upon the time of entry into the program. Students should submit the progress sheet by March 31 of each year to their major advisors. If they cannot meet this deadline, students must provide reasonable excuses to their major advisors.

Any QPM doctoral student whose academic progress is deemed problematic during a certain annual review is put on probation and must meet with the advisory committee as soon as possible to develop a remediation plan. If a student continues to make unsatisfactory academic progress during the probation period (i.e., in the subsequent academic year), the student must meet with the Director of Graduate Studies, who oversees the QPM program. At that time, appropriate actions

can be determined, including another probation period in the QPM program, transfer from the QPM program to a different graduate program, or withdrawal from graduate studies altogether.

PRACTICAL RESOURCES

Deadlines

Doctoral students are responsible for following the deadlines for completing all appropriate forms with the Graduate School. Deadline information is listed in the schedule of classes under the academic calendar. Students currently in the QPM program, who intend to continue in the upcoming semester, must preregister. Any newly admitted QPM student or any student who rejoins the QPM program can preregister for the spring semester if the student is admitted or rejoins by November 1, by April 1 if the student is admitted or rejoins for the Summer semester, and by July 15 if the student is admitted or rejoins by July 15. The student does not need any permission to register and all registrations need to be done online through <http://myuk.uky.edu>.

Writing

Although not required, QPM doctoral students are strongly encouraged to adopt the most current writing guidelines of the American Psychological Association (APA) for all their writings (e.g., assignments, articles, dissertations) (see the Publication Manual of the American Psychological Association). Dissertations prepared in the APA style are accepted by the Graduate School (see the writing guidelines of the Graduate School, http://www.gradschool.uky.edu/CurrentStudents/theses_prep.html).

Doctoral students who need to overcome difficulties in writing communication are strongly encouraged to use the Writing Center (<http://wrd.as.uky.edu/writing-center>) at the University of Kentucky. Staff in the Writing Center provide assistance with writing and expression. All QPM students are encouraged to work with a professional editor on their dissertation proposals and final dissertations.

College of Education Office of Information Systems

The Office of Information Systems provides support for the use of media and technology in teaching, research, and service (<https://www.coe.uky.edu/CoEIS/techsupport/>). A large collection of hardware and software can be checked out for student use.

Other Resources

Home department website: <http://education.uky.edu/EDP> or <http://education.uky.edu/EPE>

Graduate School website: <http://www.gradschool.uky.edu/>

The University of Kentucky library system website is <http://libraries.uky.edu/>. Libraries relevant to the QPM program are located in different colleges (e.g., College of Arts and Sciences, College of Education, W. T. Young Library).

Complaints and Grievances:

<http://www.research.uky.edu/gs/CurrentStudents/resources.html#disputes>