Psychological and Quantitative Foundations, PhD

Educational Measurement and Statistics

The Doctor of Philosophy program in psychological and quantitative foundations with an educational measurement and statistics subprogram requires a minimum of 90 s.h. of graduate credit. Students must maintain a UI cumulative grade-point average of at least 3.00 to remain in good standing in the Graduate College.

The subprogram prepares students for senior professional positions in educational measurement and statistics including quantitative methods, psychometrics, and data analytics. Graduates find employment in higher education, state and federal agencies, not-for-profit and commercial testing organizations, large public and private school systems, educational technology, and research institutions. Many students complete research internships with prospective employers during their second or third year of graduate study.

The doctorate is a U.S. Department of Homeland Security STEM-designated degree program in educational statistics and research methodology, recognized as such in the U.S. Department of Education's Classification of Instructional Programs (CIP code 13.0603) due to its focus on research, innovation, and the development of new technologies in testing and psychometric methods.

Students who enter the subprogram without an MA thesis must complete a substitute project before taking the PhD comprehensive examination.

The PhD in Psychological and Quantitative Foundations with an educational measurement and statistics subprogram requires the following coursework.

Required Courses

During the first year of graduate study, a student and their advisor plan a program of study that is appropriate for the student's interests and vocational objectives. The doctorate involves advanced work in educational measurement and psychometrics, quantitative methods, research design, and related areas. Work in other University of Iowa departments that is consistent with the student's interests is encouraged. Many doctoral candidates also complete graduate certificates, minors, and secondary degrees during their graduate studies.

Educational Measurement

Course #	Title	Hours
All of these:		
PSQF:6255	Construction and Use of Evaluation Instruments	3
PSQF:6257	Educational Measurement and Evaluation	3
PSQF:6258	Theory and Technique in Educational Measurement	3
PSQF:6262	Item Response Theory	3
PSQF:7358	Equating and Scaling of Educational Tests	3
At least two of these:		
PSQF:6249	Factor Analysis and Structural Equation Models	3
PSQF:6259	Scaling Methods	3
PSQF:6260	Diagnostic Assessment	3
PSQF:7355	Seminar: Educational Measurement and Evaluation	3
PSQF:7375	Topics in Educational Measurement and Statistics	3
PSQF:7455	Generalizability Theory	3
PSQF:7476	Research in Educational Measurement and Statistics	3

Applied Statistics

Course #	Title	Hours
All of these:		
PSQF:6243	Intermediate Statistical Methods	3
PSQF:6246	Design of Experiments	3
PSQF:6252	Introduction to Multivariate Statistical Methods	3
PSQF:6270	Generalized Linear Models	3
At least three of these:		
PSQF:6244	Correlation and Regression	4
PSQF:6247	Nonparametric Statistical Methods	3
PSQF:6248	Research Synthesis and Meta-Analysis	3
PSQF:6249	Factor Analysis and Structural Equation Models	3
PSQF:6250	Computer Packages for Statistical Analysis	3
PSQF:6254	Causal Inference and Observational Designs	3
PSQF:6271	Longitudinal Multilevel Models	3
PSQF:6272	Clustered Multilevel Models	3
PSQF:7355	Seminar: Educational Measurement and Evaluation	3
PSQF:7375	Topics in Educational Measurement and Statistics	3
PSQF:7476	Research in Educational Measurement and Statistics	3

Additional Research Requirements

The College of Education research requirements may be satisfied by 9 s.h. from the required courses in educational measurement and applied statistics, by completing PSQF:6220 Quantitative Educational Research Methodologies and PSQF:7331 Qualitative Educational Research Methods, or by completing two other courses comparable in content coverage and level of rigor with departmental approval.

Third Area of Concentration

Students are required to complete a minimum of 9 s.h. in a coherent program of coursework outside of educational measurement and statistics that is beyond the courses listed above. The third area of concentration may come from related disciplines such as mathematical statistics, biostatistics, computer science, curriculum, higher education, program evaluation, learning sciences, data science, or informatics.

These must be graduate-level courses that are consistent with a plan approved by the student's advisor.

Electives

Students are encouraged to take elective courses that complement their interests. These electives, chosen in collaboration with the academic advisor, may include courses in related areas such as psychology, learning sciences, mathematical statistics, informatics, or data science. All students are expected to develop proficiency in computer programming methods sufficient to support their research and professional objectives.

Comprehensive Examination

After completing most of their coursework, students take the comprehensive examination. The comprehensive examination is not a deferred qualifying examination. Rather, it is intended to evaluate a student's mastery of the concepts from the program of study at or near the end of the student's formal preparation and before completion of the dissertation. The composition of the comprehensive examination committee and the requirements to pass the comprehensive exam must follow the College of Education and Graduate College guidelines.

During the comprehensive exam, the committee seeks further evidence of the student's independent command of concepts across their program of study. The comprehensive examination consists of a written component followed by an oral component.

The details and format of the written and oral components of the exam are determined by the comprehensive examination committee to ensure that the exam represents the student's own work. The written component may include a traditional examination (in-person or take-home) or an extended research activity. The oral component is satisfied by a meeting of the examination committee with the student. At the conclusion of the oral component, the examining committee makes a single decision (satisfactory, with reservations, or unsatisfactory) across all aspects of the examination.

Dissertation

Work for the PhD concludes with the dissertation. The dissertation research study is planned in collaboration with the student's examining committee chair and members and includes a proposal meeting and a final examination. Committee members approve both the examination and the final document submitted by the student. A student must complete a minimum of 9 s.h. of dissertation credit, and no more than 12 s.h. may count towards the 90 s.h. that is required for the doctorate. Students may register for additional dissertation credit hours until completed.

Admission

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website. Preference is given to applicants who have an undergraduate GPA above 3.00 and a graduate GPA above 3.50.

The faculty encourages applicants from a wide range of backgrounds and identities. Applicants with a BA/BS or a more advanced degree are eligible to apply.