

Quantitative Methods

<http://ehs.siu.edu/epse>

COLLEGE OF EDUCATION AND HUMAN SERVICES

Graduate Faculty:

Elmore, Patricia B., Professor, *Emerita*, Ph.D., Southern Illinois University Carbondale, 1970; 1967.

Headrick, Todd Christopher, Professor, Ph.D., Wayne State University, 1997; 1999.

Koran, Jennifer, Assistant Professor, Ph.D., University of Maryland, 2009; 2009.

Kowalchuk, Rhonda K., Associate Professor, Ph.D., University of Manitoba, 2000; 2004.

Leitner, Dennis W., Associate Professor, *Emeritus*, Ph.D., University of Maryland, 1975; 1974.

Lewis, Ernest, Professor, *Emeritus*, Ph.D., Southern Illinois University Carbondale, 1971; 1970.

Sheng, Yanyan, Associate Professor, Ph.D., University of Missouri - Columbia, 2005; 2005.

Doctor of Philosophy Degree in Education

The Department of Counseling, Quantitative Methods, and Special Education offers graduate studies leading to the Ph.D. degree majoring in Education with a concentration in Quantitative Methods. The purposes of this graduate program are to prepare professional quantitative methodologists to pursue careers or research in their areas of interest.

Individualized courses of study are linked to the teaching and research capabilities of the faculty. Sufficient latitude is provided so that students in concert with their advisor and committee plan programs that capitalize on student interests and faculty capabilities.

Application. Students must apply to the Department of Counseling, Quantitative Methods, and Special Education, Southern Illinois University, Mail Code 4618, Carbondale IL 62901. Phone: 618-536-7763. Specific questions about the major in Education or the concentration in Qualitative Methods and how to apply should be directed to the address identified above or by phone.

A non-refundable application fee of \$65.00 must be submitted with the application. Applicants must pay this fee with a credit card.

Admission and Retention. Applications are reviewed by the Quantitative Methods faculty and recommendations forwarded to the College of Education and Human Services and the Graduate School. Test scores from the Graduate Record Examination are required. A personal interview with a candidate is required. Admission to the program is dependent on (1) the applicant's grades in their master's program, (2) GRE scores, (3) prior course work, and (4) availability of qualified faculty to supervise the applicant's doctoral work. Applicants must also meet other admission requirements of the program. The performance of each doctoral candidate is reviewed each semester. Maintenance of a grade point average of 3.0 and compliance with policies of the department, college, and Graduate School are also required.

Core Requirements. Specific courses or other degree requirements

are determined by the program upon recommendation from the student's doctoral committee.

Research and Teaching. Each student is required to demonstrate professional competence through supervised experiences. These experiences include research, teaching, and personal interactions in consulting or assessment situations.

Preliminary Examinations. All Ph.D. candidates must pass a preliminary examination over their doctoral course work before formal admission to candidacy. The doctoral committee with the concurrence of the program is responsible for the development and evaluation of the preliminary examination.

Doctoral Committees. Students are assigned a doctoral advisor upon admission to the program. Before the end of the first year of doctoral study each student and his/her advisor should discuss prospective doctoral committee chairpersons based on the student's research interests. Each doctoral student works with his/her doctoral committee to develop and approve a rigorous program of study. The committee is also responsible for an oral examination over the completed dissertation and student's general knowledge of the professional field.

Courses (QUAN)

Courses in this program may require the purchase of supplemental materials.

402-3 Basic Statistics. A master's level terminal statistics course. Emphasis on descriptive statistics and graphical representation of data. Includes a brief introduction to hypothesis testing procedure.

506-4 Inferential Statistics. Covers basic descriptive techniques such as central tendency, measures of variability and graphical presentation of data. In addition, hypothesis testing, analysis of variance, nonparametrics and simple linear prediction will be covered.

507-4 Multiple Regression. The general linear model is presented which allows for hypothesis testing including correlational analysis, analysis of variance and analysis of covariance. Non-linear relationships are presented. Emphasis is placed on testing the stated research hypotheses. Prerequisite: QUAN 506.

508-4 Experimental Design in Educational Research. (Same as PSYC 522.) Strategies of designing research studies and the analysis of data from studies using linear models are examined. Emphasis will be placed on internal and external validity and factors that affect power in variance designs including completely randomized designs, Latin square, repeated measures and analysis of covariance with each of the above designs. Prerequisite: QUAN 506 or equivalent.

531-3 Principles of Measurement. (Same as PSYC 525). Intended to provide theoretical principles of measurement which are applicable to both teaching and research. Part of the course will be devoted to current issues in measurement and to practical applications to these theoretical principles. Prerequisite: QUAN 506.

533-3 Survey Research Methods. Overview of survey methods covering topics such as the purpose of survey research methods, the process of survey research, ethical considerations in survey research, questionnaire design and administration, sampling

designs, data processing, and reporting of survey research. Students are expected to be familiar with basic descriptive statistics, inferential statistical procedures and principles of instrument construction/development. Prerequisite: QUAN 506 & QUAN 531 or equivalent.

580-2 to 29 (3,3,3,3,2,3,3,3,2 to 6) Doctoral Seminar in Quantitative Methods. A series of advanced seminars on statistics and measurement. Sections a through h may be taken only once each. Section i may be repeated as topics vary. (a) Advanced regression analysis. (b) Factor analysis. (c) Multivariate methods. (d) Nonparametric methods. (e) Evaluation methods. (f) Experimental design. (g) Advanced measurement theory. (h) Computer applications. (i) Selected topics. Prerequisite: QUAN 507.

592-1 to 8 (1 to 6 per semester) Independent Study and Investigation. For advanced graduate students. Topics of interest to the individual student are studied under supervision of a program staff member. Special approval needed from the program.

593-1 to 4 Individual Research. For advanced graduate students in Quantitative Methods. Formulating, investigating and reporting of research problems in the area of Quantitative Methods. Special approval needed from the program.

600-1 to 32 (1 to 16 per semester) Dissertation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded S/U or DEF only.