EDP Psychometrics Courses

EDP 380P. Psychometrics.
Theory, models, methods, and applications in psychometrics and program evaluation. For each semester hour of credit earned, one lecture hour a week for one semester. With consent of the adviser in the student's area of specialization, may be repeated for credit when the topics vary. Some sections are offered on the credit/no credit basis only. Prerequisite: Graduate standing and consent of the adviser in the student's area of specialization.

Topic 1: Measurement and Evaluation. A basic background in measurement and evaluation is necessary to be appropriately critical of tests and instruments that are used in educational and psychological measurement situations. Subjects include general principles and basic concepts; types of reliability and validity; and the use of psychometric principles in various testing areas, such as intelligence testing; special aptitudes and abilities; educational achievement; and non-cognitive characteristics. Additional prerequisite: Twelve semester hours of upper-division coursework in education, psychology, or other behavioral sciences.

Topic 2: Psychometric Theory and Methods. Topics include mental test theory and methods (including the classical true-score model, item response theory models, and test construction methods); an introduction to factor analysis; and psychological scaling theory and procedures. Additional prerequisite: Educational Psychology 380E or equivalent, and 380P (Topic 1: Measurement and Evaluation or equivalent) or consent of instructor.

Topic 3: Individual Testing. Additional prerequisite: Educational Psychology 380P (Topic 1) or consent of instructor.

Topic 4: Evaluation Models and Techniques. Traces the contemporary development of evaluation in education and human service and identifies milestones and existing directions. Subjects include the relationship between research and evaluation; evaluation models and approaches; behavioral objectives; needs assessment techniques; program modeling and decomposition; evaluation methodology; outcome evaluation; and evaluation instruments. Additional prerequisite: Educational Psychology 380E or equivalent or consent of instructor.

Topic 5: Advanced Psychoeducational Assessment and Evaluation. Additional prerequisite: Educational Psychology 380P (Topic 1) or consent of instructor.

Topic 6: Item Response Theory. Topics include background and theory (including classical test theory, objectivity in mental measurement, dichotomous and polytomous models, conventional item analysis versus the item response theory approach, item parameter and ability estimation, and information functions), and applications (including relative efficiency of tests, flexilevel and two-stage tests, computerized adaptive tests and mastery tests, test equating, differential item functioning, and attitude and personality measurement). Additional prerequisite: Educational Psychology 380P (Topic 2: Psychometric Theory and Methods) or consent of instructor.

Topic 8: Test and Scale Construction. Design of effective instruments and cognitive tests; facet theory for scale construction; measurement of opinions and beliefs; tryout of experimental forms and item analysis; use of factor analysis and multidimensional scaling; norms and scaled
scores; reliability and validity assessment; and test equating methods. Additional prerequisite: Educational Psychology 380P (Topic 2: Psychometric Theory and Methods) or consent of instructor.

**Topic 9: Advanced Psychometrics Seminar.** Additional prerequisite: Educational Psychology 380P (Topic 2) or consent of instructor.

**Topic 10: Practicum in Evaluation.** Additional prerequisite: Educational Psychology 380P (Topic 4) or consent of instructor.

**Topic 11: Practicum in Psychometrics.** Additional prerequisite: Educational Psychology 380P (Topic 2) or consent of instructor.

**Topic 12: Practicum in Research and Evaluation Methodology.** Additional prerequisite: Educational Psychology 380P (Topic 4) or consent of instructor.

**Topic 13: Computer-Based Testing.** In-depth examination of computer-based testing systems based on item response theory (IRT) models, including cases where the items are scored either right or wrong and cases where items are scored using more than two categories. Subjects include data simulation procedures; estimation of item and person parameters; item banking techniques; components of CAT algorithms; and issues concerning reliability, validity, and score reporting. Additional prerequisite: Educational Psychology 380P (Topic 6: Item Response Theory) or consent of instructor.

**Topic 14: Applied Psychometrics.** In-depth examination of applied psychometric techniques. Subjects include equating scores; setting standards; detecting differential item functioning and selection, placement, and classification. Additional prerequisite: Educational Psychology 380P (Topic 2: Psychometric Theory and Methods) or consent of instructor.

**Topic 15: Advanced Psychometrics Research.** Additional prerequisite: Educational Psychology 380P (Topic 2) or consent of instructor.

**Topic 16: Advanced Item Response Theory.** Advanced course intended for doctoral students specializing in quantitative methods. Subject matter includes extensions of IRT models presented in the Item Response Theory course (EDP: Topic 6), including multidimensional IRT and testlet response theory. Additional topics may include explanatory item response modeling, IRT rater models, cognitive diagnostic IRT models, response time models, and related topics. Additional prerequisites: Educational Psychology 380P (Topic 6: Item Response Theory) and Educational Psychology 384 (Topic 16: Hierarchical Linear Models) or consent of instructor.