

# Course Selection Sheet

## ERM Certificate Program UIC College of Education

### Directions for the Applicant:

Please attach this to your goal statement which you will be submitting to the College of Education. To assist us in planning our staffing needs, please indicate which three (the minimum to earn the ERM certificate; more may be selected if desired) courses you are likely to take. This is not a commitment by you to take those three courses; we are only trying to obtain initial projections for our staff planning needs. Please check the box next to each course you plan on taking; course descriptions are provided on the next two pages. Thank you.

- EPSY 503: Essentials of Quantitative Inquiry in Education
- EPSY 504: Rating Scale and Questionnaire Design and Analysis
- EPSY 506: Item Response Theory
- EPSY 509: Research Design in Education
- EPSY 512: Hierarchical Linear Models
- EPSY 546: Educational Measurement
- EPSY 547: Multiple Regression in Educational Research
- EPSY 560: Educational Program Evaluation
- EPSY 561: Assessment for Measurement Professionals
- EPSY 562: Large-Scale Testing
- EPSY 563: Advanced Analysis of Variance in Educational Research
- EPSY 583: Multivariate Analysis of Educational Data

**Please note these are general descriptions of the courses. Variations in content will be expected depending on the instructor.**

**EPSY 503: Essentials of Quantitative Inquiry in Education (4 hours)**

This course introduces theory and assumptions behind parametric statistics and provides hands-on experience in conducting basic quantitative research (t-test, correlation, regression, analysis of variance). Students will be able to 1) recognize and define basic descriptive and inferential statistical terms and concepts; 2) arrive at accurate answers to selected statistical problems and procedures; 3) demonstrate competence in using SPSS for data manipulations and analysis; and 4) recognize when and when not to use certain statistical procedures. Offered: fall, spring and summer semesters.

**EPSY 504: Rating Scale and Questionnaire Design and Analysis (4 hours)**

This course will prepare students with the skills necessary to develop rating scales designed to measure latent constructs and questionnaires designed to gather factual information with the primary emphasis on rating scales. Topics covered include Messick's unified validity theory, assessing the reliability and validity for person and item responses, evaluating the functioning of a rating scale, assessing dimensionality and analyzing and reporting results using methods based in latent trait theory, specifically Rasch measurement. Students will analyze and summarize the results of their own rating scale analysis. Examples will be drawn primarily from the fields of education, psychology and physical rehabilitation. Offered: spring semester and summer.

**EPSY 506: Item Response Theory (4 hours)**

This course deals with Item Response Theory (IRT) measurement models that are useful for analyzing test data. Compared to Classical Test Theory, IRT provides better information about examinees and may improve the efficiency of test development and subsequent testing when it is applied properly. IRT models may be used in a variety of applications (e.g., achievement tests, attitude surveys, and personality inventories). Much of this course will focus on unidimensional IRT models for dichotomous data (scored 0 or 1) because this content provides the necessary basis for understanding more advanced IRT models. Treatment will also be given to topics such as polytomous IRT models, test development, computerized adaptive testing, item bias, and test equating. Although significant time will be dedicated to discussing IRT concepts, this is intended to be an "applied" course. Several classes will be dedicated to examining examples and learning how to use IRT software with real data sets. It is expected that, by the end of the term, students will be able to apply their newfound knowledge and skills. Offered: fall semester.

**EPSY 509: Research Design in Education (4 hours)**

The course introduces students to the process of planning, designing and conducting educational research. Upon presenting an overview of common quantitative, qualitative and mixed-method research methods, the course focuses on taking students through the process of writing a complete research proposal to address a particular research topic. It is suggested that students use this course to explore various methodologies that they might incorporate into their research interests and use the course project to design a pilot study. Offered: fall semester.

**EPSY 512: Hierarchical Linear Models (4 hours)**

Hierarchical Linear Modeling (HLM) is an advanced statistical method widely used in social sciences including education, sociology, and organizational research. It is capable of dealing with situations where units of observations are nested under clusters (i.e., students nested under classrooms, children nested under families) and the assumption of independence of observations is violated. This course is designed to help students develop a conceptual understanding of HLM and the skills to conduct HLM analyses; interpret results; and understand and critique studies using HLM. This course will start with a review of regression and cover modeling setting, testing and evaluating assumptions, estimation of model parameters, and hypothesis testing. Students will learn HLM through typical model examples, including two and three-level models, growth models, hierarchical generalized linear models, and hierarchical models for latent variables. Lab sessions will follow each lecture. Lab sessions are designed with the goal to help students apply the concepts learned during the lecture and develop analytical and communication skills. Offered: spring semester.

**EPSY 546: Educational Measurement (4 hours)**

This course familiarizes students with classical test theory, including test reliability and validity. It also introduces item analysis useful in test construction, factor analysis, as well as the major extensions and alternatives to classical test theory: generalizability theory and item response theory. Four computer programs will be used in the class: Excel (to assist hand calculation for conceptual understanding), SPSS (for item analysis, reliability, factor analyses), GENOVA (for G theory), and Bilog (for IRT). Offered: spring semester.

**EPSY 547: Multiple Regression in Educational Research (4 hours)**

This course introduces students to multiple correlation and regression techniques as tools for the analysis and interpretation of educational and behavioral science data. Offered: fall semester.

**EPSY 560: Educational Program Evaluation (4 hours)**

The overarching goal of the course is for students to gain an appreciation for the importance of program evaluation, its role in the field of education, and the crucial role that evaluators, clients and stakeholders play in that complex enterprise. Topics addressed in the course will include key evaluation concepts and terms, purposes and goals of evaluation, history of evaluation, alternative approaches to evaluation, quantitative and qualitative measures, process and outcome evaluation, contracting and planning evaluations, designing evaluation instruments, reporting evaluation results, and political and ethical issues in evaluation. Offered: fall semester.

**EPSY 561: Assessment for Measurement Professionals (4 hours)**

In this course students will craft different types of assessment instruments to measure a variety of learning outcomes. They will learn about the characteristics and strengths/limitations of various types of assessment methods, and how to select assessment methods that are most appropriate for particular purposes. Students will develop specifications for assessments and create technically sound paper-and-pencil tests that incorporate different types of item formats (e.g., multiple-choice, true-false, matching, short-answer, completion, essay, interpretive exercises). They will construct performance (or product) assessments, as well as tools to evaluate performances or products (i.e., checklists, rating scales, and rubrics). Later in the course, we will look at the selection and use of standardized tests. Students will learn how these tests are constructed, and they will practice interpreting statistics included in score reports. We will discuss universal test design principles, as well as assessment modifications and accommodations that persons with disabilities and non-native language learners can use to participate meaningfully in assessment activities. Finally, students will learn how to develop defensible grading procedures for combining scores from different assessments to arrive at a grade. Throughout this course students will read and discuss key pieces of assessment-related research, focusing on validity and reliability issues that different types of assessments raise. Offered: spring semester.

**EPSY 562: Large-Scale Testing (4 hours)**

This course provides an introduction to large-scale testing, presenting an overview of the various tasks that employees perform in testing organizations, city-wide testing bureaus, professional licensing and certification boards, statewide educational testing programs, testing units that are part of state merit systems, etc. The course should be useful for students considering working for such organizations in a variety of capacities (e.g., item writers, statisticians, psychometricians, researchers, testing program managers), employees currently working in these organizations who would like to increase their understanding of the field, and students who want to gain an understanding of the challenges of creating and administering large-scale tests. The course is organized around the key processes common to all large-scale testing programs: design, administration, scoring, reporting, and validating. The course is not designed to develop the technical skills to carry out specific tasks such as writing items, equating tests, setting cut scores, etc. Rather, the focus is on gaining a conceptual understanding of what is involved in performing these kinds of tasks, and why each task is important. After completing this course, students should have an appreciation for what is involved in producing large-scale tests, as well as an awareness of some of the pressing issues that testing organizations face.

Offered: spring semester.

**EPSY 563: Advanced Analysis of Variance in Educational Research (4 hours)**

This course provides detailed coverage of the principles of analysis of variance and the analysis of data collected from research employing experimental designs. Offered: spring semester.

**EPSY 583: Multivariate Analysis of Educational Data (4 hours)**

This course is an introduction to multivariate statistical methods including data screening, canonical correlation, MANOVA/MANCOVA, DFA, profile analysis, logistic regression, component/factor analysis, confirmatory factor analysis, and structural equation modeling. The course will examine the assumptions underlying each method, teach students to run analyses for each method, assist students with interpreting the relevant sections of computer output, and discuss how results may be written for possible publication. Offered: fall semester.