Research Methods Courses Available
from the Curry School of Education
August 11, 2015

Statistics Courses

**EDLF 5310 Data Management for Social Science Research**
This course introduces strategies for effectively working with large-scale quantitative data for social science research. Topics covered include: data cleaning, recoding and checking; merging data from multiple sources; reshaping data; documenting processes; writing programs and macros to reduce errors; and presenting descriptive data through tables and graphs. Students will utilize Stata, a statistical software package. This course is usually offered in fall semester of every year.

**EDLF 5330 (Formerly 7310) Descriptive and Inferential Statistics**
Analysis of descriptive to inferential techniques. Specific procedures include the logic of hypotheses testing, t-tests, chi-square, correlation, and simple linear regression. Emphasis is on the theoretical basis and applied usage of these procedures as a necessary foundation for more advanced study. Students will learn to use statistical software such as SPSS, Stata, or R. This course is usually offered in fall and spring semester of every year.

**EDLF 7300 Foundations of Educational Research**
Social and education science research encompasses a varied and challenging set of knowledge and skills to master. The nature of the research problems are complex and multifaceted; addressing these questions requires a diverse and strategic combination of research traditions, designs, and methods, so no single research design course exposes students to all that might be of relevance and interest. This course has two broad goals: (1) to build a foundation on which students can begin to development an understanding of social and education science research designs and methods; and (2) to develop students’ basic competencies in specifying linkages among research questions, designs, methods, evidence, inference, and use. This course is offered every fall semester.

**EDLF 7420 (Formerly 8300) Experimental Design and Statistical Analysis: Stat II**
This course is designed to provide students with both a theoretical and applied understanding of experimental/randomized control designs and analysis of variance (ANOVA). Emphasis on the applied use of these principles will be facilitated through SPSS or R. This course is usually offered in fall and spring semester of every year.

**EDLF 8310 Correlation and Regression Analysis: Stat III**
This course is intended to be a continuation of the quantitative methods sequence that began with 5330 and 7420. It covers applied statistical methods and provides tools for students who intend to conduct their own statistical analyses, as well as those who want to become critical consumers
Curry Research Methods Courses 2

of statistics. Topics covered include linear least-squares regression, statistical inference for regression, linear-model diagnostics, and generalized linear model. Coursework includes both problem solving and computer-based assignments that involve conducting data analysis and writing and communicating descriptions of statistical results. Students will learn to use SPSS, Stata, or R. Prerequisite: EDLF 5330 and 7420, or instructor permission. This course is usually offered in fall and spring semester of every year.

EDLF 5500 Causal Inference in Educational Policy Research
An advanced methods course on quasi-experimental statistical techniques for generating unbiased effect estimates when random assignment is not feasible. Underlying theories, identifying assumptions, and applications are presented for techniques drawn from a variety of disciplines including economics, sociology, and psychology including regression discontinuity, instrumental variables, difference-in-difference, matching, and fixed effects. This course is usually offered in spring semester of every year.

EDLF 5500 Field Experiments
This course has three purposes. The first is to introduce students to recent methodological advances in the design and analysis of field experiments, particularly in school settings. The second is for students to read and discuss well-known field experiments that have important implications for policy, and/or our understanding of science. The third is to demonstrate that although the course is about field experiments, many of the issues that are addressed extend easily to the design and analysis of observational studies. Students will learn to use Stata for the analysis of field experiments. Prerequisite: EDLF 7420, 8310, or equivalent. This course is usually offered in spring semester of odd-numbered years.

EDLF 8360 Multilevel Modeling in Education Research
This course is designed to familiarize students with the basics of multilevel modeling. Topics include random effects ANOVA models, means-as-outcomes models, random coefficients models, intercepts- and slopes-as-outcomes models, contextual models, random effects ANCOVA models, linear growth models, nonlinear growth models and cross-classified models. Prerequisite: EDLF 8310 or equivalent. This course is usually offered in fall semester of odd-numbered years.

Additional statistics courses include EDLF 8350 Stat IV Multivariate Statistics and EDLF 8361 Structural Equation Modeling. These courses feature statistical and measurement models. Details are listed below.

(Continued on next page)
Measurement Courses

EDLF 7180 Tests and Measurements
This introductory course concentrates on the evaluation and interpretation of assessment tools. Topics include reliability and validity; social and ethical considerations of testing; summarizing and interpreting measurements; and the use of standardized tests, rating scales, and observational scales. This course is usually offered in fall semester of every year.

EDLF 7403 Survey Design and Instrument Construction
This course provides students with practical experience in survey research. Topics focus on survey design, administration, analysis, and reporting. Specific topics include item writing guidelines, cognitive interviews and pilot testing, survey implementation and planning, sampling methods, data analysis, and presentation of survey results. Particular attention is given to strategies for ensuring reliable survey responses and valid inferences. This course is usually offered in fall of every year.

EDLF 8340 Measurement Theory
Fundamentals of item response theory and generalizability theory. Topics include the Rasch, two-parameter logistic, and three parameter logistic models for binary items and the partial credit, rating scale, and generalized partial credit models for polytomous items. Additional topics include scale linking and score equating, dimensionality assessment, and connections to other latent variable models. Generalizability topics include estimation of variance components for generalizability studies, and estimation of reliability coefficients for decision studies. Application of these methods to educational and psychological testing and the use of statistical software is emphasized. Students will learn to use statistical software such as R and jMetrik. Prerequisites: EDLF 7180 and EDLF 8310 or instructor permission. This course is usually offered in spring of even-numbered years.

EDLF 8350 Stat IV Multivariate Statistics
Presents the theory and rationale of selected multivariate statistical techniques. Topics include multivariate analysis of variance, canonical correlation, discriminant analysis, exploratory factor analysis, and confirmatory factor analysis. Emphasizes computer-assisted analysis and the application of appropriate statistical methods to research data. Prerequisite: EDLF 7420 and 8310, or instructor permission. This course is usually offered in spring semester of every year.

EDLF 8361 Structural Equation Modeling
The major topics include exploratory/confirmatory factor analysis models, a variety of structural equation models, growth curve models, and multi-sample modeling analysis. The major focus of the course is both on the conceptual understanding of latent variable modeling and on practical application of these models in research and measurement. Students will work with data sets and computer programs to gain practical research experience. Prerequisite: EDLF 8310 and 7180 or equivalent. This course is usually offered in spring of odd-numbered years.

(Continued on next page)
Qualitative and Program Evaluation Courses

EDLF 7060 Theoretical Perspectives on Educational Policy
This course introduces students to the use of theory in the educational research process by examining interpretive and critical theoretical approaches in educational policy research. It examines current theories including micro-macro theories, critical race theories, feminist and postmodern theories and their applications in research methods such as critical discourse analysis, critical ethnography, etc., as they pertain to policy research, policy analysis, and policy evaluation.

EDLF 7404 Qualitative Analysis
This class serves as an introduction to the central concepts of qualitative methods in research and evaluation. Primary emphasis is on the development of skills required to conduct qualitative research, with a focus on research design, specific methods of inquiry, and approaches to analysis. The philosophy and epistemology of qualitative approaches are also discussed. Empirical readings provide examples of qualitative research within education and related fields. This course is usually offered fall and spring semester of every year.

EDLF 7402 Introduction to Program Evaluation
An overview of current program evaluation approaches, this class is designed to provide an overview of the theories behind and approaches to evaluation as well as to begin to train students in evaluation design and methods. Theoretical, methodological, and empirical readings emphasize the terminology of educational evaluation and the variety of theoretical and design approaches to evaluation. Consideration is also given to the application of evaluation approaches and designs to non-educational settings. This course is usually offered in fall of odd-numbered years.

EDLF 7410 Mixed Methods Research Design
This course provides an introduction to mixed methods in social science/educational research. We will consider the types of questions that mixed methods can answer and discuss the benefits/challenges of mixed methods research. We will cover research design, sampling, and analysis, including reading exemplars of mixed methods research. Students will apply the theoretical/methodological tenets learned by designing their own mixed methods study. This course is usually offered in fall semester of even-numbered years.

EDLF 8400 Program Evaluation Design
Explores problems of designing, conducting, and reporting evaluation research studies. Time is spent examining philosophies of science that underlie evaluation studies; conceptualizing a total evaluation study; planning for the use of time and resources in conducting an evaluation study; assembling the evidence for or against a particular proposition; analyzing costs; and learning how to avoid common pitfalls in working with clients and program participants to design and conduct an evaluation study. This course is usually offered in fall semester of odd-numbered years.

EDLF 8440 Advanced Qualitative Analysis
Advanced course in methods and practices of qualitative research. Students determine their own philosophy of inquiry and become increasingly proficient in the application of qualitative methods. Assumes an introductory course in qualitative methods. Focuses on research design and
Curry Research Methods Courses 5

proposal development, data collection and analysis techniques, and presentation of findings. The course is field-based and guides students through the complete qualitative research cycle. This course is usually offered in spring semester of every year.

EDLF 8450 Qualitative Analysis with computers
An advanced course in qualitative research methods that emphasizes the application of qualitative analysis using a qualitative data analysis software package as a tool. Readings focus on various approaches to qualitative analysis and the issues surrounding software use in relation to these approaches. A general knowledge of qualitative research design and methods and comfort with computers is assumed. Part of each class serves a workshop to learn a qualitative data analysis program and, therefore, the class is most useful for students who have data to analyze. Prerequisite: EDLF 7404 (Introduction to Qual) or equivalent course is required: EDLF 8440 (Advanced Qual) is recommended. This course is no longer offered. Its content is now included in other qualitative courses.

Course Sequence Chart
The next page shows a course sequence chart. It will help you understand the recommended sequence of courses. For example, if your aim is to take a course in structural equation modeling, find that course on the chart and identify the course prerequisites. Solid arrows in the chart represent required course prerequisites, and dashed arrows indicate recommended prerequisites.

(Continued on next page)
Qualitative/Evaluation Emphasis

- Descriptive and Inferential Statistics
  EDLF 5330
  Fall & Spring
- Advanced Qualitative Analysis
  EDLF 8440
  Spring

Theoretical Perspectives on Educational Policy
EDLF 7060

Foundations of Educational Research
EDLF 7300
Fall

- Qualitative Analysis
  EDLF 7404
  Fall & Spring
- Introduction to Program Evaluation
  EDLF 7402
  Fall Odd Years

Mixed Methods Research Design
EDLF 7410
Fall Even Years

- Data Management
  EDLF 5310
  Fall

- Stat II Experimental Design & Statistical Analysis
  EDLF 7420
  (Previously 8300)
  Fall & Spring
- Stat III Regression
  EDLF 8310
  Fall & Spring

- Stat IV Multivariate
  EDLF 8350
  Spring

Test and Measurements
EDLF 7180
Fall

Program Evaluation Design
EDLF 8400
Fall Odd Years

Observed Variable Emphasis

- Causal Inference
  EDLF 5500
  Spring

- Field Experiments
  EDLF 5500
  Fall

- Multilevel Modeling in Education Research
  EDLF 8360
  Fall Odd Years

- Structural Equation Modeling
  EDLF 8361
  Spring Odd Years

- Measurement Theory
  EDLF 8340
  Spring Even years

- Survey Design
  EDLF 7403
  Fall

Mixed Methods Research Design
EDLF 7410
Fall Even Years

Stat IV Multivariate
EDLF 8350
Spring

Latent Variable Emphasis

- Theoretical Perspectives on Educational Policy
  EDLF 7060
- Qualitative/Evaluation Emphasis
  EDLF 8440
  Spring

- Advanced Qualitative Analysis
  EDLF 8440
  Fall

- Qualitative Analysis
  EDLF 7404
  Fall & Spring

- Introduction to Program Evaluation
  EDLF 7402
  Fall Odd Years

- Mixed Methods Research Design
  EDLF 7410
  Fall Even Years

- Data Management
  EDLF 5310
  Fall

- Stat II Experimental Design & Statistical Analysis
  EDLF 7420
  (Previously 8300)
  Fall & Spring

- Stat III Regression
  EDLF 8310
  Fall & Spring

- Stat IV Multivariate
  EDLF 8350
  Spring

- Test and Measurements
  EDLF 7180
  Fall

- Program Evaluation Design
  EDLF 8400
  Fall Odd Years

- Causal Inference
  EDLF 5500
  Spring

- Field Experiments
  EDLF 5500
  Fall

- Multilevel Modeling in Education Research
  EDLF 8360
  Fall Odd Years

- Structural Equation Modeling
  EDLF 8361
  Spring Odd Years

- Measurement Theory
  EDLF 8340
  Spring Even years

- Survey Design
  EDLF 7403
  Fall

Required Prerequisite
Recommended Prerequisite