Educational Statistics and Research Methods (ESRM)

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Educational Statistics and Research Methods website (http://esrm.uark.edu)

Degrees Conferred:  
Ph.D. in Educational Statistics and Research Methods (ESRM)

Graduate Certificates Offered (non-degree):  
Educational Statistics and Research Methods (EDST)

Program Description: The Educational Statistics and Research Methods program develops professionals in the areas of educational research methods and policy studies, both through courses and independent research. Graduates can obtain employment with school districts, educational agencies, and industries with internal data analysis needs.

Graduate Certificates
Admission to the Graduate Certificate Programs: In addition to meeting University requirements for admission to the Graduate School, applicants must have earned a master’s degree with a 3.25 cumulative GPA and minimum scores on the Graduate Record Examinations at the 48th percentile Verbal, the 65th percentile Quantitative and the 48th percentile on Analytic Writing. Higher performance on the quantitative component of the GRE may compensate for a lower GPA in admissions decisions.

Requirements for the Ph.D. Degree: Students must complete all requirements of the Graduate School for the Doctor of Philosophy degree, and complete an approved program of study including a minimum of 36 credit hours of core courses, 9 hours of elective courses, and 18 credit hours of doctoral dissertation. Coursework must be completed with a cumulative grade average of at least 3.25, with no credit for courses with a grade of “C” or lower.

EDFD 5373 Psychological Foundations of Teaching and Learning 3
EDFD 5683 Issues in Educational Policy 3
ESRM 6403 Educational Statistics and Data Processing 3
ESRM 6413 Experimental Design in Education 3
ESRM 6423 Multiple Regression Techniques for Education 3
ESRM 6453 Applied Multivariate Statistics 3
ESRM 6513 Hierarchical Linear Modeling 3
ESRM 6523 Structural Equation Modeling 3
ESRM 6533 Qualitative Research 3
ESRM 6553 Advanced Multivariate Statistics 3
ESRM 6613 Evaluation of Policies, Programs, and Projects 3
ESRM 6653 Measurement and Evaluation 3
ESRM 6753 Item Response Theory 3
ESRM 699V Seminar 6
ESRM 700V Doctoral Dissertation 18

Total Hours 63

Students should also be aware of Graduate School requirements with regard to doctoral degrees (http://catalog.uark.edu/graduatecatalog/degreerequirements/#phandedddegreetext).

Graduate Certificate in Educational Statistics and Research Methods

Graduate Certificate in Educational Statistics and Research Methods:

The graduate certificate in Educational Statistics and Research Methods recognizes students who complete a core of courses focused on developing theoretical, application, and interpretative aspects of statistical techniques and research methods. Graduate students completing this certificate will also develop comprehensive programming and data management skills necessary for today’s academic researcher.

Admission to the Certificate Program: In addition to meeting University requirements for admission to the Graduate School, applicants must have earned a master’s degree with a minimum 3.00 cumulative GPA on a 4.00 scale or be currently enrolled in a doctoral program at the University of Arkansas. Although there is no minimum GRE score required for the certificate admission, successful applicants admitted to this certificate will typically have GRE scores of above 40th percentile on both Verbal and Quantitative Reasoning sections and 30th percentile on Analytic Writing section. If you believe that your test scores are not valid indicators of your ability, you are welcome to explain your concerns in a statement of purpose. We encourage you to contact the Educational Statistics and Research Methods program coordinator with questions.
**Certificate Requirements:** Completion of a required list of courses for a certificate with a grade-point average of 3.40.

**Program Of Study**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ESRM 6403</td>
<td>Educational Statistics and Data Processing</td>
<td>3</td>
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<tr>
<td>ESRM 6413</td>
<td>Experimental Design in Education</td>
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<tr>
<td>ESRM 6423</td>
<td>Multiple Regression Techniques for Education</td>
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Select two of the following:

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<tr>
<td>ESRM 6453</td>
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<td>Measurement and Evaluation</td>
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<td>ESRM 6513</td>
<td>Hierarchical Linear Modeling</td>
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<td>ESRM 6523</td>
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<td>Advanced Multivariate Statistics</td>
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<td>ESRM 6533</td>
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<td>ESRM 6543</td>
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<td>ESRM 6753</td>
<td>Item Response Theory</td>
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<td>ESRM 699V</td>
<td>Seminar</td>
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**Total Hours:** 15

**Educational Foundations Courses**

**EDFD 5373. Psychological Foundations of Teaching and Learning.** 3 Hours.
Psychological principles and research applied to classroom learning and instruction. Social, emotional, and intellectual factors relevant to topics such as readiness, motivation, discipline, and evaluation in the classroom. (Typically offered: Irregular)

**EDFD 5683. Issues in Educational Policy.** 3 Hours.
This course examines how K-12 education policy is designed and implemented in the United States. Students will develop a working knowledge of policymaking frameworks to examine major education policies of current interest and debate key policy issues that arise at each level of government. (Typically offered: Fall, Spring and Summer)
This course is cross-listed with EDRE 6413.

**Educational Statistics and Research Methods Courses**

**ESRM 5013. Research Methods in Education.** 3 Hours.
General orientation course which considers the nature of research problems in education and the techniques used by investigators in solving those problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

**ESRM 5303. Healthcare Analytics Fundamentals.** 3 Hours.
The Healthcare Analytics Fundamentals course provides fundamental knowledge and skills in several major areas of healthcare and business data analytics in a modular format. Several modules that emphasize healthcare analytics as well as data fundamentals, concepts, and problems are used and include - Healthcare Analytics Concepts, Problems, and Management; Intermediate & Advanced Spreadsheet Topics; Relational Databases & SOL; and Introductory Programming with Python. Prerequisite: Program Director permission. (Typically offered: Irregular)

**ESRM 5393. Statistics in Education and Health Professions.** 3 Hours.
Applied statistics course for Master's degree candidates. Includes concepts and operations for frequency distributions, graphing techniques, measures of central tendency and variation, sampling, hypothesis testing, and interpretation of statistical results. (Typically offered: Fall, Spring and Summer)

**ESRM 5823. Healthcare Business Analytics I.** 3 Hours.
Fundamentals of healthcare analytics to include data patterns, forecasting techniques, and linear prediction models, including theoretical and mathematical study of assumptions in model building. Prerequisite: ESRM 5303, ISYS 5503, ISYS 5833, and ISYS 5843, or permission of the instructor. (Typically offered: Irregular)

**ESRM 5853. Healthcare Business Analytics II.** 3 Hours.
Intermediate healthcare analytics to include categorical analyses and logistic regression for binary and polytomous models applied to healthcare. Prerequisite: ESRM 5823 or instructor permission. (Typically offered: Irregular)

**ESRM 600V. Master's Thesis.** 1-6 Hours.
Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

**ESRM 605V. Independent Study.** 1-6 Hours.
Independent study. (Typically offered: Fall, Spring and Summer)

**ESRM 6403. Educational Statistics and Data Processing.** 3 Hours.
Theory and application of frequency distributions, graphical methods, central tendency, variability, simple regression and correlation indexes, chi-square, sampling, and parameter estimation, and hypothesis testing. Use of the computer for the organization, reduction, and analysis of data (required of doctoral candidates). Prerequisite: ESRM 5013 or ESRM 5393 or an equivalent course, each with a grade of C or better. (Typically offered: Fall, Spring and Summer)

**ESRM 6413. Experimental Design in Education.** 3 Hours.
Principles of experimental design as applied to educational situations. Special emphasis on analysis of variance techniques used in educational research. Prerequisite: ESRM 6403 with a grade of C or better or an equivalent course with a grade of C or better. (Typically offered: Fall)

**ESRM 6453. Applied Multivariate Statistics.** 3 Hours.
Multivariate statistical procedures as applied to educational research settings including discriminant analysis, principal components analysis, factor analysis, canonical correlation, and cluster analysis. Emphasis on use of existing computer statistical packages. Prerequisite: ESRM 6413 and ESRM 6423, both with a grade of C or better. (Typically offered: Spring)

**ESRM 6513. Hierarchical Linear Modeling.** 3 Hours.
This course covers the theory and applications of hierarchical linear modeling (HLM) also known as multilevel modeling. Both the conceptual and methodological issues for analyses of nested (clustered) data in using HLM will be reviewed, including linear models, non-linear models, growth models, and some alternative designs. Prerequisite: ESRM 6413 and ESRM 6423, both with a grade of C or better. (Typically offered: Fall Even Years)

**ESRM 6523. Structural Equation Modeling.** 3 Hours.
This course provides a detailed introduction to structural equation modeling (SEM) based on students' previous knowledge of multiple linear regression. Topics include path analysis, confirmatory factor analysis, full latent variable models, estimation techniques, data-model fit analysis, model comparison, and other topics, potentially equivalent models, specification searches, latent mean models, parameter invariance, multi-group models, and models of discrete data. Prerequisite: ESRM 6423 with a grade of C or better. (Typically offered: Spring)

**ESRM 6533. Qualitative Research.** 3 Hours.
Introduction of non-quantitative methods, including data collection through interviews, field observation, records research, internal and external validity problems in qualitative research. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall and Spring)

**ESRM 6543. Advanced Qualitative Research.** 3 Hours.
Preparation for the conduct of qualitative research, structuring, literature reviews, data collection and analysis, and reporting results. Prerequisite: ESRM 6533 with a grade of C or better. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.
ESRM 6553. Advanced Multivariate Statistics. 3 Hours.
Builds on the foundation provided in Multivariate and introduces techniques that extend methodological elements of canonical, discriminant, factor analytic, and longitudinal analyses, providing the mathematical and theoretical foundations necessary for these designs. Prerequisite: ESRM 6453 with a grade of C or better. (Typically offered: Spring Even Years)

ESRM 6613. Evaluation of Policies, Programs, and Projects. 3 Hours.
Introduction to evaluation in social science research, including why and how evaluations of programs, projects, and policies are conducted; includes analysis of actual evaluations in a variety of disciplines. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall)
This course is cross-listed with EDRE 6213.

ESRM 6653. Measurement and Evaluation. 3 Hours.
Fundamentals of measurement: scales, scores, norms, reliability, validity. Test and scale construction and item analysis. Standardized measures and program evaluation models in decision making. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall)

ESRM 668V. Practicum in Research. 1-6 Hour.
Practical experience in educational research on campus, in school systems, or in other agencies in educational program development. (Typically offered: Irregular)

ESRM 6753. Item Response Theory. 3 Hours.
Topics of measurement in the psychometric field focusing on item response theory; item level and test level analyses including differential item functioning, test dimensionality, computer adaptive testing, equating, and general evaluation and usage of measurement instruments. Prerequisite: ESRM 6653 with a grade of C or better. (Typically offered: Spring Odd Years)

ESRM 699V. Seminar. 1-6 Hour.
Seminar. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ESRM 700V. Doctoral Dissertation. 1-18 Hour.
Doctoral dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.