RUTGERS
Graduate School of Education

Spring 2017
Statistical Methods I in Education I
15:291:531:01 (11583)
3 Credits

Instructor: Lynne E. Kowski, Ph.D.
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Day & Time: Wednesdays 4:30 – 7:30 pm
Location: CAC Scott Hall SC-203
Office hours: Wednesdays 7:30 – 8:30 pm (or by appointment)

Learning Goals

- Program goals: The Master's of Education degree in Educational Statistics, Measurement and Evaluation aims to provide students training in basic and intermediate statistical, measurement, and evaluation methods. It serves as a preparation for students interested in working in research institutions, and pursuing Ph.D. studies in educational statistics and measurement or a related field. The Ph.D.in Statistics and Measurement within the Learning, Cognition, Instruction, and Development concentration prepares students to become statisticians and psychometricians with broad expertise in applied statistics, measurement theory, educational assessment and statistical analysis. An important feature of the program is early exposure to research and active learning through a variety of course offerings.

- Course goals: This course is the first part of a one-year sequence in statistical methods designed to introduce students to the most commonly used methods in educational and social science research. Topics covered in this course include graphical representations, descriptive statistics, correlation, regression, experimental designs, basic probability, sampling distributions, confidence intervals, and hypothesis testing.

Upon successful completion of this course, you will be able to complete the following tasks:

1. Be able to use and interpret graphical representations.
2. Understand the basic probability theory and the foundation of statistical methods.
3. Understand the normal distributions of random variables as well as their properties.
4. Have a basic understanding of estimating correlation and linear regression.
5. Carry out the basic statistical analysis using calculator and/or computer software (SPSS).
6. Conduct research hypothesis tests and construct confidence intervals.
7. Make a decision based on the statistical test results and interpret the results.

Course Catalog Description: Descriptive statistics, SPSS statistical package, graphing, normal distribution theory, simple regression, correlation analysis, elementary probability theory, sampling, confidence intervals, and introduction to hypothesis testing.

Class Materials/ Textbooks

- Textbook: Moore, D. S., McCabe, G.P. & Craig, B.A. (2014). Introduction to the Practice of Statistics (8th ed) edition). New York: W. H. Freeman

- Calculator: A **non-graphing** statistical calculator is necessary for homework assignments, class exercises and exams.

- Software: SPSS for Windows (Version 19). New York: Prentice-Hall (*Purchase not necessary – on campus access*)

Other Description of Course Methods

- No prior knowledge of statistics is required, but essentials of arithmetic and basic algebra will be used throughout the semester.

- Software & Calculator: SPSS will be used to run some statistical analyses for homework assignments and class exercises. However, for the exams, a calculator that performs basic operations will suffice.

Grading Policy: Final letter grade will be assigned as follows:

Final Score	Letter Grade
90% and Above	**A**
80%-89.99%	**B+**
75%-79.99%	**B**
65%-74.99%	**C+**
60%-64.99%	**C**
55%-59.99%	**D**
Below 55%	**F**

Course Assignments and Requirements

- **Email & eCollege Access:** Efficient communication is the key to evaluate how successful an online course is and in this course, **emailing** and **eCollege** are the two communication tools that we heavily rely on. To maximize teaching and learning effects, you have to check your email account frequently and make sure you are able to read information, download files, drop messages, do homework, and access your grades from our webpage. All information and activities are time sensitive. Late responses and requests will not be handled. For example, you will have a run of time to finish each homework assignment. However, you will not be able to access the homework questions after the designated time.

- **Exams:** The two exams, midterm and final, are worth 30% and 30% of the final grade, respectively. The exams will be created to measure the course goals listed above. ***No makeup exam will be granted unless 1) there is advance notice or 2) emailing me with the request within 24 hours of the exam, along with written documentation to be handed in the next class or the day of the makeup exam.***

- **Homework assignments:** Approximately 10 homework assignments, worth 40% of the final grade, will be given throughout the semester. Homework assignments will be created to assess the course goals. Homework assignments will be assigned and will assigned and given a week to complete. You have a whole week to work on a homework assignment. ***For every portion of a week a homework assignment is late, there will be a 10% point reduction.***

- **Participation:** Your participation is expected throughout the semester.

Academic Integrity Policy: The Office of Student Conduct supervises issues related to violations of academic integrity (see http://academicintegrity.rutgers.edu). Please familiarize yourself with the university policy on academic integrity at http://academicintegrity.rutgers.edu/academic-integrity-policy

Office of Disability Services: Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: https://ods.rutgers.edu/students/registration-form.

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Course Schedule: The following class schedule is subject to change if necessary. Reading assignments must be completed prior to each lecture.

Expectations: For every credit hour, you should expect to spend 1-2 hours outside the classroom reading, doing homework, studying per week. Therefore for this 3 credit class you should expect to devote 3 to 6 hours per week.

Tentative list of topics for discussions (by week)

Week/Date	**Assigned Reading Sections**
Week 1: January 18th – 24th	1.1 Data Distributions 1.2 Displaying and Describing Distributions
Week 2: January 25th – 31st	1.3 Describing Distributions with Numbers
Week 3: February 1st – 7th	1.4 Density Curves and Normal Distributions
Week 4: February 8th – 14th	2.1 Relationships 2.2 Scatterplots 2.3 Correlation
Week 5: February 15th – 21st	2.4 Least-Squares Regression
Week 6: February 22nd – 28th	2.5 Cautions about Correlation and Regression
Week 7: March 1st – 7th	3.2 Designs of Experiment 3.4 Introduction to Statistical Inference
Week 8: March 8th	**MIDTERM EXAM Sections 1.1 - 3.4**
March 11th – 19th	**SPRING BREAK!**
Week 9: March 22nd – 28th	4.1 Randomness 4.2 Probability Models
Week 10: March 29th – April 4th	4.3 Random Variables 4.4 Means and Variances of Random Variables
Week 11: April 5th – 11th	5.1 Sampling Distribution of a Sample Mean 5.2 Sampling Distribution Counts & Proportions
Week 12: April 12th – 18th	6.1 Estimating with Confidence
Week 13: April 19th – 25th	6.2 Tests of Significance
Week 14: April 26th – May 2nd	6.3 Use and Abuse of Tests; Effect Size
Week 15: May 3rd	**FINAL EXAM Sections 4.1 - 6.3**