

Statistical Methods I

15:291:531:01

3 Credits

Instructor: Lynne E. Kowski, Ph.D.

Day & Time: Tuesdays 4:50 – 7:30 pm

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Location: Scott Hall SC 119

Office hours: Tuesdays 7:30 – 8:30 pm (by appointment)

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 calculator that performs basic operations (e.g., arithmetic and square-root operations) is necessary for homework assignments, class exercises and exams

Software SPSS for Windows (Version 18). New York: Prentice-Hall

Course catalogue description

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. No prior knowledge of statistics is required, but essentials of arithmetic and basic algebra will be used throughout the semester. Topics covered in this course include graphical representations, descriptive statistics, correlation, regression, experimental designs, basic probability, sampling distributions, confidence intervals, and hypothesis testing.

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

1. Understand and interpret how to use graphical representations.
2. Understand the basic probability theory, 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 or computer software (SPSS).
6. Conduct the basic test research hypotheses and perform confidence intervals.
7. Make a decision based on the statistical results and interpret the results.

Course Requirements

1. **Email & eCollege Access:** Emailing and eCollege are the two communication tools that we heavily rely on. To maximize the 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.
2. **Exams:** The two exams, midterm and final, are each worth 30% of the final grade, totaling 60% of the final grade.
3. **Homework Assignments:** Approximately 10 homework assignments, worth 40% of the final grade, will be given throughout the semester. Homework assignments will be assigned on Tuesdays after class and are due the following Tuesday, the week after they are assigned. So basically you have a whole week to work on a homework assignment. You have to hand in all of the homework assignments as a hardcopy. ***Late homework will not be accepted.***
4. **Participation:** Your participation is expected during the semester.

Final grade Final letter grade will be assigned as follows:

Final average	Letter grade
90% and above	A
80% - 89%	B+
75% - 79%	B
65% - 74%	C+
60% - 64%	C
Below 60%	F

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Course Schedule *Reading assignments must be completed prior to each lecture!*

Tentative list of topics for discussions (by week)

Week/Date	Reading Sections	Assignments
1: Sept. 2 nd	1.1 Data Distributions 1.2 Displaying and Describing Distributions	HW 1.2 #25, 26, 28, 35, 42
2: Sept. 9 th	1.3 Describing Distributions with Numbers	HW 1.3 #64, 65, 66, 77, 80
3: Sept. 16 th	2.1 Relationships 2.2 Scatterplots	HW 2.2 #18, 22, 24, 25, 31
4: Sept. 23 rd	2.3 Correlation 2.4 Least-Squares Regression	HW 2.4 #66, 67, 81, 82, 84
5: Sept. 30 th	2.5 Cautions about Correlation and Regression	HW 2.5 #94, 98, 103, 104, 106
6: Oct. 7 th	3.1 Sources of Data 3.2 Designs of Experiment	
7: Oct. 14th	MIDTERM EXAM	Sections 1.1 - 3.3
8: Oct. 21 st	4.1 Randomness 4.2 Probability Models	HW 4.2 #20, 23, 27, 28, 30
9: Oct. 28 th	4.3 Random Variables 4.4 Means and Variances of Random Variables	HW 4.4 #75, 76, 79, 82, 86,
10: Nov. 4 th	5.1 Sampling Distribution of a Sample Mean 5.2 Sampling Distribution Counts & Proportions	HW 5.2 #48, 52, 54, 59, 61
11: Nov. 11 th	6.1 Estimating with Confidence	HW 6.1 #12, 13, 16, 22, 29, 30
12: Nov. 18 th	6.2 Tests of Significance	HW 6.2 #52, 53, 54, 71, 72
13: Nov. 25 th	6.3 Use and Abuse of Tests	
14: Dec. 2 nd	Review Session	
15: Dec. 9th	FINAL EXAM	Sections 1.1 - 6.3