

Applied Statistics – Spring 2020

67-201-005 Mo We Fr 12:40 – 1:40 PM Swart 14

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Office hours: Mo We Fr 1:50 – 2:50 PM
Others by appointment

Text: *Introduction to the Practice of Statistics* (without access code), Ninth Edition, by Moore/McCabe/Craig.
To access Sample Questions and Answers and many other useful online resources, visit Website:
<https://www.macmillanlearning.com/Catalog/studentresources/ips9e>

Calculator: A graphing calculator TI-83 or TI-84 is required. Bring your calculator to class every day.

Prerequisites: PBIS 187, 188 or 189 or Mathematics 104, 108 or 204 with a grade of C or better.

Learning Objective: This course is an introduction to applied statistics, which is the science of gathering and analyzing data. Topics covered include descriptive statistics, both graphical and numerical, simple regression and correlation, elementary probability, sampling distributions, and the fundamentals of statistical inference, including confidence intervals and hypothesis testing. A student who has successfully learned this material will be prepared to interpret data from whatever field they are studying.

Upon successful completion of the course, students are expected to have the ability to:

- Describe and understand graphical displays of data.
- Describe and understand numerical summaries of data.
- Calculate with technology areas under the normal curve.
- Understand and calculate with technology correlations and regression equations.
- Understand and describe different sampling schemes, and understand the principles of experimentation to establish cause and effect.
- Describe and calculate probabilities using the basic rules.
- Understand and create elaborate probability calculations using trees and Venn diagrams.
- Develop and explain the reasoning behind sampling distributions, including the Central Limit Theorem.
- Understand and calculate the formulas for confidence intervals.
- Understand and calculate the formulas for hypothesis tests.

- Compare and contrast the various t-tests, one- and two-sample, matched pairs, and z-tests for proportions.

Course Coverage:**CHAPTER 1 Looking at Data—Distributions**

- 1.1 Data
- 1.2 Displaying Distributions with Graphs
- 1.3 Describing Distributions with Numbers
- 1.4 Density Curves and Normal Distributions

CHAPTER 2 Looking at Data—Relationships

- 2.1 Relationships
- 2.2 Scatterplots
- 2.3 Correlation
- 2.4 Least-Squares Regression
- 2.5 Cautions about Correlation and Regression
- 2.6 Data Analysis for Two-Way Tables
- 2.7 The Question of Causation

CHAPTER 3 Producing Data

- 3.1 Sources of Data
- 3.2 Design of Experiments
- 3.3 Sampling Design
- 3.5 Ethics

CHAPTER 4 Probability: The Study of Randomness

- 4.1 Randomness
- 4.2 Probability Models
- 4.3 Random Variables
- 4.4 Means and Variances of Random Variables
- 4.5 General Probability Rules

CHAPTER 5 Sampling Distributions

- 5.1 Toward Statistical Inference
- 5.2 The Sampling Distribution of a Sample Mean
- 5.3: Sampling Distributions for Counts and Proportions

CHAPTER 6 Introduction to Inference

- 6.1 Estimating with Confidence
- 6.2 Tests of Significance
- 6.3 Use and Abuse of Tests
- 6.4 Power and Inference as a Decision

CHAPTER 7 Inference for Distributions

- 7.1 Inference for the Mean of a Population
- 7.2 Comparing Two Means

CHAPTER 8 Inference for Proportions

8.1 Inference for a Single Proportion

8.2 Comparing Two Proportions

Evaluation:

Exam: There will be 3 exams each worth 100 points. The exams will be given in the Testing Center. You will have two hours for each exam. There will be no make-up exams given except under special circumstances and prior notice.

Test Dates:

Exam 1:	Mar.4 th & 5 th	Chapters 1 & 2
Exam 2:	Apr.13 th & 14 th	Chapters 3, 4, & 5
Exam 3:	May 13 th & 14 th	Chapters 6, 7, & 8

Quizzes: Online quizzes will be given through the Canvas course site. Please pay attention to the due dates for the quizzes.

Homework: Homework will be assigned for each section. These problems will not be collected for grading but used for discussion.

WebWork: You will complete homework problems on WebWork. WebWork is an online homework deliver system developed by the Mathematical association of America. Detail information will be given in class. The WebWork problems can be worked on until you get them correct with no time limit. Please pay attention to the due dates for the homework assignments

Attendance: Attendance will be taken in each class. If absent, it is your responsibility to obtain the missed lecture notes and to do the assignment.

Grading:	Exams (3)	60% (20% each)
	Quizzes, Assignments, & Projects	35%
	Attendance	5%

[92 , 100]	A	[89 , 92)	A ⁻	[86, 89)	B ⁺
[82 , 86)	B	[79 , 82)	B ⁻	[75, 79)	C ⁺
[70 , 75)	C	[67, 70)	C ⁻	[64 , 67)	D ⁺
[60, 64)	D	[55, 60)	D ⁻	Below 55	F

Tutors: The Center for Academic Resources (CAR) provides free tutoring for students in most undergraduate classes on campus. Check the Tutoring List page on CAR's website (www.uwosh.edu/car) for a list of tutors.

Remarks:

If you have any concerns or questions, please feel free to see me during my office hours or make an appointment.

Cell phones should be turned off during class period.

Students are subject to disciplinary action for academic misconduct, which is in UWS 14.03, Wisconsin Administrative Code.