

PSYCH 240: STATISTICS IN PSYCHOLOGY • Spring 2009 •

Course Instructor

Michael J. Stroud

Office Location: Cyberspace

Email: mstroud@psych.umass.edu

Office Hours: I will be available online almost always. If you need to meet in person (and live near UMass), feel free to set up a meeting.

“Statistics ... the most important science in the whole world: for upon it depends the practical application of every other science and of every art; the one science essential to all political and social administration, all education, all organisation based upon experience, for it only gives the results of our experience.” ~ Florence Nightingale

COURSE DESCRIPTION:

This class is designed to give the student basic conceptual knowledge of statistical reasoning and skill in applying common statistical techniques. Topics include probability; measures of central tendency, variability, and correlation; and statistical inference involving one- and two-group means. If time permits, we will also cover inferences for proportions, chi-square distributions, and analysis of variance (ANOVA).

TEXTBOOK:

We will be reading and working with problems from the following textbook:

Moore, D. S. (2004). *The Basic Practice of Statistics*. 4th Edition. New York: W.H. Freeman and Company.

It is available for purchase at the University of Massachusetts Textbook Annex. They have it available for \$25.00 which actually beats most websites.

CALCULATOR:

You will need a 2-variable calculator for this class. A calculator will be necessary to complete the problem sets and for exams. You can find 2-variable calculators at Staples for around 20 dollars (TI-36X) or there are more expensive ones like a TI-83 (~\$100) or a Casio FX-9750GPLUS (~\$50).

Online Study Center: You need to purchase a code to access the online study center that accompanies the textbook. It is within this module that you be able to access the main lectures for the course. This will also give you access to self-tests, statistical applets, study guides and other resources that will help you conquer the course. Here are the instructions for gaining access to OSC:

- Go to the website: <http://bcs.whfreeman.com/osc/bps4e/>
- On the right side under “Student register,” click on “purchase access.”
- Even though it says you are purchasing an online version of the book, you are actually purchasing access to the site. Just enter ‘01003’ into the box and click ‘next’
- Fill out the form and when it asks for the instructor’s email, input “mstroud@psych.umass.edu”
- Select ‘Univ of Massachusetts-Amherst’ and click next
- Enter your payment information and follow the instructions from there.

After you complete the registration and login, spend some time navigating through the site. The general resources link (on the left side) includes Crunch It! and the applets among other things. The Resources by Chapter link is where you will find the lectures for each chapter. There are multiple parts to each chapter lecture. I will guide you through each week with regard to which lectures to view by which date.

LEARNING OUTCOMES (GOALS OF THIS COURSE):

Gain an understanding and appreciation for a number of statistical methods used to analyze data Develop and refine skills in critical thinking, analytical reasoning, and problem solving, especially as it relates to psychological research and statistical analysis Learn how to use statistical software (CrunchIt!) to explore data and perform statistical tests Gain an appreciation for the wide-range of applications (both experimental and practical) where statistics can be used Learn how to be a more critical consumer of statistical information

EVALUATION OF LEARNING OUTCOMES:

Weekly Discussion Topics

I expect you to view every class lesson. You have something important to **give** and **get** from every class meeting. Reading should be completed **before** each class lecture. At the beginning of almost every week, there will be discussion topics led by me on the Vista Website. You are expected to contribute to each discussion by posting a minimum of two times. There will also be part of the message board devoted to discussion about the problem sets. This is not required, but I highly encourage you to participate when you are having trouble. Participation in the weekly discussion topics will be worth 100 points (10% of your final grade).

Problem Sets

Each week, you will receive a problem set for homework that includes statistical problems about topics that we have covered that week in class. Problem sets will include some statistical problems for you to work out by hand and some that will require the use of a computer and CrunchIt!. Problem sets are due to me by 5:00 pm on the Monday after they are assigned and must be submitted via e-mail. Late assignments that are turned in within 24 hours of the deadline will receive an immediate 10% point deduction; assignments turned in more than 24 hours late will receive a grade of 0. There will be 11 problem sets total, each worth 30 points and I will drop the lowest problem set grade for the semester. So, collectively, homework makes up 300 points (30% of your final course grade).

Exams

There will be 4 total exams throughout the semester. Due to the fact that statistical concepts and equations build off of one another, you can expect every test to be cumulative and include any material that we have covered. However, material on the test will focus primarily on information that was covered on the last problem set or since the last test. For each test, you will be able to use your books, calculators and any software available. Out of these 4 tests, your 3 highest grades will count. There will be NO make-up tests. Each test will be worth 100 points (10% of your final grade in the course). Together, your 4 highest tests will make up 300 points (30% of your final grade in the course).

Final Exam

There will be a cumulative final exam available during finals week. As with the previous exams, you will be able to use your book, calculator and any software. The final exam will be worth 300 points (30% of your grade).

COURSE GRADES:

Discussions: 100 points 10%; Problem Sets (10 Assignments, 30 points each) 300 points 30%; Tests (top 3 out of 4 tests; 100 points each) 300 points 30%; Final Exam 300 points 30%

TOTAL POINTS = 1000 POINTS		
GRADE	PERCENT	POINTS EARNED
A	94-100	940-1000
A-	89-93	890-939
B+	85-88	850-889
B	82-84	820-849
B-	79-81	790-819
C+	75-78	750-789
C	72-74	720-749
C-	69-71	690-719
D+	65-68	650-689
D	62-64	620-649
F	< 62	< 620

SPECIAL ARRANGEMENTS If you need special arrangements due to a disabling condition, please let me know as soon as possible so accommodations can be made that ensure that you are still able to master all of the learning outcomes.

Outline of Topics		
Date	Topic	Reading±
Tuesday, January 27 th	Introduction; Categorical variables	Preface: pp. xxii – xxix; Ch. 1: pp. 0 – 10
Thursday, January, 29 th	Quantitative and qualitative variables	Ch. 1: pp. 10 – 24
Tuesday, February 3 rd	Descriptive Statistics	Ch. 2: pp. 38 – 45
Thursday, February 5 th	Descriptive Statistics cont.	Ch. 2: pp. 45 – 56
Tuesday, February 10 th	The Normal Distribution	Ch. 3: pp. 64 – 76
Thursday, February 12 th	The Normal Distribution cont.	Ch. 3: pp. 76 – 83
Tuesday, February 17 th	Presidents' Day	
Thursday, February 19 th	Exam 1	
Tuesday, February 24 th	Scatterplots	Ch. 4: pp. 90 – 98
Thursday, February 26 th	Correlation	Ch. 4: pp. 99 – 103
Tuesday, March 3 rd	Regression	Ch. 5: pp. 115 – 126
Thursday, March 5 th	Regression cont.	Ch. 5: pp. 126 – 136
Tuesday, March 10 th	Sampling	Ch. 8
Thursday, March 12 th	Exam 2	
Tuesday, March 17 th	Spring Break	
Thursday, March 19 th	ENJOY!!	
Tuesday, March 24 th	Experiments	Ch. 9: pp. 213 – 226
Thursday, March 26 th	Experiments cont.	

Tuesday, March 31 st	Probability	Ch. 10: pp. 246 – 252
Thursday, April 2 nd	Probability cont.	Ch. 10: pp. 252 – 260
Tuesday, April 7 th	Sampling distributions	Ch. 11: pp. 271 – 285
Thursday, April 9 th	Exam 3	
Tuesday, April 14 th	Confidence intervals	Ch. 14: pp. 344 – 356
Thursday, April 16 th	Significance testing	Ch. 15: pp. 363 – 370
Tuesday, April 21 st	Patriots' Day	
Thursday, April 23 rd	Significance testing cont.	Ch. 15: pp. 371 – 381
Tuesday, April 28 th	Inference	Ch. 18: pp. 433 – 439
Thursday, April 30 th	Inference cont.	Ch. 18: pp. 439 – 448
Tuesday, May 5 th	Exam 4	
Thursday, May 7 th	Two-sample problems	Ch. 19: pp. 460 – 473
Tuesday, May 12 th	Analysis of Variance (ANOVA)	Ch. 25: pp. 491 - 507
Finals Week	Final Exam (comprehensive)	

*This syllabus is a guide for how the course will go but is subject to change.

Mandatory Disclaimer

Plagiarism

Plagiarism is representing someone else's work as your own. This includes copying information from ANY website without proper citation, copying someone else's paper, buying a paper, or letting someone copy your work. In this course, there will be no opportunities for collaboration on written assignments. You are expected to talk to your classmates about the course material but NEVER to share in the writing of papers, nor are you to use papers written by previous students in this course. Plagiarism will result in a grade of F and a report will be filed with the Academic Honesty Board. This penalty will be enacted both for the person who copies and anyone who allows copying to occur.

Plagiarism will be discussed in class and you will be expected to understand what constitutes plagiarism. You are expected to understand your sources sufficiently well to write your own paper *in your own words*. However, you should cite the sources of ALL ideas in your papers even when you are paraphrasing a source.

The Department policy states all students are expected to adhere scrupulously to the University policy concerning academic honesty, which is found in "Undergraduate Rights and Responsibilities" at the following website:

http://www.umass.edu/dean_students/code_conduct/acad_honest.htm