
Experimental Design & Statistical Inference (PSY 3234) – 3 credits

Course Syllabus, Spring 2017

Tues. & Thurs. 8:00 am – 9:20 am

GS 118 (South Classroom Building)

Prerequisites: PSY 1012 (General Psychology)

Instructor: Edward Ester, Ph.D

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Office Hour(s): Wed. & Thurs., 10:00-11:30 am or by appointment

Teaching Assistant: Bryan Conklin

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Office: BS 326 (Behavioral Sciences Building)

Office Hour(s): Tues 11-12 am or by appointment

Course Overview

Open any textbook or journal article in any Psychology, Biology, Neuroscience, Political Science, Economics, or Sociology textbook and you'll be bombarded with statistics: p-values, t-scores, f-scores, z-scores, confidence intervals, and ratio scores. What do all of these mean?

The goals of this course are (a) introduce basic statistical techniques commonly used in the field of Psychology (as well as Biology, Sociology, Neuroscience, Political Science, and Economics, among others), and (b) provide a basic overview of how, when, and why to use these techniques. More broadly, this course is designed to prepare you for more advanced statistical course work and to give you the tools needed to pursue your own research projects.

Credit Hour Definition

This course involves 50 minutes of in class instruction for each credit hour per week.

Course Materials

Textbook: Textbook publishers are (mostly) evil and greedy, so in lieu of a traditional textbook we'll be using the open-source statistics text developed by the OpenStax foundation at Rice University (who coincidentally also have an Owl for a mascot). You can find it here:

<https://openstax.org/details/books/introductory-statistics>. You can download and/or print a digital copy (pdf) of the text for free, or order a physical copy through amazon for \$33.50.

Handouts/Notes: Occasionally textbook materials will be supplemented or replaced with handouts and/or additional reading. All materials will be made available on Canvas one week (7 days) prior to the date(s) they are covered in class.

Lecture Slides: All lecture slides will be posted on Canvas within 24 hours after each class.

Exams and Grading

Exams: There will be three exams (two midterms and one final), all graded on a 0-100 point scale. All exams will contribute equally towards your final grade, but each exam is non-cumulative (in other words, each exam will only cover topics introduced after the previous exam). **All exams are open notebook, open slides, open text, open internet, and open anything else** – feel free to use whatever resources you think will be helpful. However, remember that *google can't help you if you don't know what to search for*, so classroom attendance and participation is strongly encouraged!

(note: as a general rule, if it's in the lecture slides, it'll probably be on the exam!)

Makeup Exams: If you miss an exam, you will be assigned a score equal to chance performance on that exam (e.g., ranging from 25-50% based on the format of the test and the number of questions). Reasonable accommodations will be made for any student who misses an exam due to documented emergencies, illness, religious observations, or extracurricular activities (athletic events, musical or theatrical performances, or debate activities). Makeup exams will be coordinated through FAU's testing center (Student Services Building Room 210). For more information or to schedule a make-up exam, e-mail Bryan (bconkli4@fau.edu).

Homework Assignments: There will be a total of six homework assignments (two per exam period) during the course. Each assignment will contain 5-7 questions designed to assess your knowledge of the material covered in lectures before each due date. Each assignment will be posted on Canvas one week before the due date.

The goal of the homework is not to provide another metric for evaluation or grading, but to *help you identify topics that you may be having difficulty understanding or need to spend more time with* through additional study or by visiting office hours.

None of the homework assignments will be graded, but for each assignment you submit you can add +5 points to the next exam. For example, if you complete homework assignments #1 and #2, you'll get 10 bonus points on Exam #1. Alternately if you complete homework assignment #3 but not homework assignment #4, you'll get 5 bonus points on Exam #2.

A few caveats: First, you can't submit a blank homework assignment or one with random scribbles on it (we are actually going to look at them). Second, homework bonuses are not cumulative! That is, you cannot "save" bonuses and apply them to your score on whatever exam you'd like to. Homework assignments 1 and 2 will be applied to your score on Exam 1, assignments 3 and 4 will be applied to your score on Exam 2, and assignments 5 and 6 will be applied to your score on the final exam.

It is possible to earn an Exam score of more than 100%. For example, a student who received a score of 94% on Exam 1 and completed both homework assignments would be assigned a score of 104%, and this score would be included in the average used to calculate that student's final grade.

Extra Credit: No extra credit assignments will be offered at any time.

Grading: Letter grades are determined by the average of your three exam scores (rounded up) according to the following scale:

Grade	Percent	Grade	Percent	Grade	Percent
A	95-100	B-	80-84	D	65-69
A-	90-94	C	75-79	D-	60-64
B	85-89	C-	70-74	F	Below 60

Communication

If you have questions regarding any course material, please stop by during office hours held by either myself (Eddie) or your teaching assistant (Bryan Conklin). Our office hours can be found on the first page of this syllabus. You can also make an appointment to meet with either Bryan or I outside of office hours. The easiest way to reach either of us is via e-mail (our addresses can be found on the first page of this syllabus).

In general, questions about course materials or topics covered in lecture should first be addressed to Bryan. However, if you're still having trouble after meeting with Bryan, please contact Eddie. Both Bryan and I will make every effort to respond to e-mails within 24 hours of receipt, but please understand that this may not always be possible.

Honor Code Policy

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Dishonesty is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. There are serious penalties for academic misconduct. For more information, see University Regulation 4.001 at http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf

Disability Policy

Florida Atlantic University (FAU) is dedicated to complying with State and Federal regulations involving the rights of students who have disabilities. Section 504 of the Rehabilitation Act of 1973

provides that no otherwise qualified individual in the United States shall, solely by reason of his or her disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

The Americans with Disabilities Act Amendments Act of 2008 states that a person with a disability is:

1. *Someone with a physical or mental impairment that substantially limits one or more major life activities, including (but not limited to) caring for oneself, performing manual tasks, seeing, hearing, eating, sleeping, walking, standing, lifting, bending, speaking, breathing, learning, reading, concentrating, thinking, communicating and working or*
2. *Someone who has a record of such an impairment or*
3. *Someone who is regarded as having such an impairment*

FAU grants academic accommodations in order to ensure that students with disabilities have an equal opportunity to attain the same quality of education as other students.

If you have or think you have a disability, please consider contacting and/or registering with FAU's office of Student Accessibility Services (www.fau.edu/sas). Contacting or registering with SAS is not required, but will help ensure that appropriate accommodations can be made.

(course schedule appears on next page)

Course Schedule:

Note: Dates, times, and topics are subject to change.

Class	Date	Topic	Homework	Reading
1	Jan 10 th (Tu.)	Introduction & Administrative		
Descriptive Statistics, Density Functions, and Confidence Intervals				
2	Jan 12 th (Th.)	Sampling, Levels of Measurement		Ch. 1 (p. 5-28)
3	Jan 17 th (Tu.)	Graphing Data, Frequency Distributions		Ch. 1 (p. 28-35) Ch. 2 (p. 67-88)
4	Jan 19 th (Th.)	Central Tendency		Ch. 2 (p. 88-97) Ch. 2 (p. 102-111)
5	Jan 24 th (Tu.)	Variability	HW #1	Ch. 2 (p. 112-119)
6	Jan 26 th (Th.)	Probability		Ch. 3 (p. 171-190)
7	Jan 31 st (Tu.)	Contingency Tables, Discrete Variables		Ch. 3 (p. 190-195) Ch. 4 (p. 239-256)
8	Feb 2 nd (Th.)	Continuous Variables		Ch. 5 (p. 307-321)
9	Feb 7 nd (Tu.)	The Normal Distribution		Ch. 6 (p. 361-374)
10	Feb 9 th (Th.)	The Central Limit Theorem	HW #2	Ch. 7 (p. 395-412)
--	Feb 14 th (Tu.)	EXAM #1		
Inferential Statistics – t-tests and ANOVA				
11	Feb 16 th (Th.)	Exam Recap & Overview		
12	Feb 21 st (Tu.)	Logic of Hypothesis Testing		Handouts/Slides
13	Feb 23 st (Tu.)	Hypothesis Testing – one-sample t-test		Ch. 9 (p. 501-528)
14	Feb 28 rd (Th.)	Hypothesis Testing – two-sample t-test		Ch. 10 (p. 561-578)
15	Mar 2 nd (Tu.)	Hypothesis Testing – repeated measures	HW #3	Ch. 10 (p. 578-584)
--	Mar 7 th (Tu.)	NO CLASS - SPRING BREAK		
--	Mar 9 th (Th.)	NO CLASS - SPRING BREAK		
16	Mar 14 th (Tu.)	Introduction to ANOVA		Ch. 13 (p. 737-750)
17	Mar 16 th (Th.)	One-way ANOVA		Ch. 13 (p. 754-780)
18	Mar 21 th (Tu.)	Factorial ANOVA	HW #4	Handouts/Slides
19	Mar 23 st (Th.)	Missing Data & Supplemental Tests		Handouts/Slides
20	Mar 28 rd (Tu.)	Repeated Measures ANOVA		Handouts/Slides
21	Mar 30 th (Th.)	Exam Review	HW # 5	
--	Apr 4 th (Tu.)	EXAM 2		
Correlation, Non-parametric statistics, and Bayesian Statistics				
22	Apr 6 th (Th.)	Exam Recap & Overview		
23	Apr 11 th (Tu.)	Correlation/Regression		Ch. 12 (p. 673-690)
24	Apr 13 th (Th.)	Estimation & Confidence Intervals		Handouts/Slides
25	Apr 18 th (Tu.)	Discrete Variables – Chi-Square Test		Ch. 11 (p. 615-627)
26	Apr 20 th (Th.)	How to use (and misuse) everything you've learned in this class (Part 1)		Handouts/Slides
27	Apr 25 th (Tu.)	How to use (and misuse) everything you've learned in this class (Part 2)	HW #6	Handouts/Slides
--	Apr 27 th (Th.)	NO CLASS - Reading Day		
FINAL EXAM: May 2nd (Tu.) 7:45-10:15 AM				