

Course Syllabus for Statistics for the Life Sciences: Introduction to Statistics at Cuyamaca College Spring 2011

Section: PSY 5782

Instructor: Steve Weinert

Room: H222

Time: 12:30 to 1:50 Mon., 12:30 to 2:50 Wed. and **1 Hour required on the internet.**

Text: Statistics Unplugged 3rd Edition, Cadwell

REQUIRED SOFTWARE: SPSS 11 (or higher) Student version.

Office: F510

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Office Hours: Please see web.

Course Description: 2 hours lecture and 3 hours lab practicum in the use of statistics in life sciences.

Prerequisite: Psy 120; Math 110 or equivalent

Course Objectives: At the end of the semester students will be able demonstrate that they can:

- a) Evaluate measures of central tendency and graphs to describe samples of data.
- b) Calculate and interpret data using correlations, proportionate reduction in error, and regression analysis.
- c) Calculate and assess the mathematical formulas of probability and apply them to statistical hypothesis testing.
- d) Take a written hypothesis and produce the relevant statistical hypotheses and determine the appropriate statistical method to evaluate a variety of types of variables.
- e) Discuss the computation and use of statistical power, its implications, and relevance in determining statistical significance.
- f) Explore the limitations and assumptions that underlie hypothesis testing and test for statistical significance.
- g) Correctly calculate t tests for dependant and independent means.
- h) Compare and contrast the differences in the error terms of z scores, t tests and analysis of variance and their role in evaluating a statistical hypothesis.
- i) Explain the basic components of the formula for the z score, F ratio, and t score.
- j) Investigate a hypothesis through literature research, development of proper experimental methods and research protocol, analysis and a written conclusion.
- k) Use a Multivariate Analysis of Variance to validate a hypothesis explaining all main effects and interaction effects found in the analysis.

Attendance: This class might not be the most entertaining class you have every had. However, for successful completion of the course you must attend class. Attendance and participation in activities are required. If you are going to miss class for some reason make sure you e-mail the instructor. You must log in to blackboard while in class to get credit for the day. Make sure that any missed assignments can be completed. I am going to be very firm this semester on late work.

Behavior Guidelines and Conduct: Some of the class will be direct instruction, but the majority of the course will be working in groups and completing assignments. Math is a skill. To get better you have to practice. If you follow instructions and do the work you will successfully complete the course. If you are having trouble, ask for help. If your instructor does not answer your question, then ask louder and more frequently.

How the Class will work: The first 50 minutes of each class will be theoretical concepts behind the statistics. The remaining time in each class will be spent reviewing material that pertains to the lab, giving lab quizzes and reviewing lab assessments. On the Web, the majority of the lab instruction will be given through outlines with videos. I have recorded the screen of my computer modeling the tasks required for lab completion. I also have produced outlines that step you through each lab. It should take you about 1 hour a week to complete the assignments.

Online: The lab for this course is set up in web based Blackboard platform. During the first week of class, we will make sure that you can log in and are able to access the web from home or from the lab. If you are having any problems tell me as soon as they develop so we can attempt to fix them. This is not a class about using the computer, and I am not able to fix problems that you have with your computer. At home you can log in whenever you want and do the labs at any time (there is some time Saturday evenings when the web site is not working, but you should be resting then anyhow). I will be available during my office hours or on e-mail for questions or concerns.

Assignment Grades: The online scores are a part of your semester grade for the class. Each Lab is designed to demonstrate the mastery of specific skills. Your grade is based on the completion of those skills, and your ability to

communicate your understanding of the data. Each lab will have points applied to it and will be added to your exams scores to produce your grade in the class.

How to use the online Lab: Each new unit in the class has a lab that corresponds to the material from lecture. The purpose of the lab is to **USE** the statistics to reinforce the concepts.

Syllabus: This document (that you are reading) is up to date with any changes that we might make to the schedule during the semester.

Assignment completion: **At the end of each assignment, you must turn in your work. If you are not finished, turn in what you have to get some points. The assignment files must be turned in to the assignment folder.**

Lab Instructions: I will post the experiment that produced the data, the basic outline of what needs to be accomplished during the lab, and a step by step video that shows me performing the lab. I also will have short video clips that go along with the outline to show the correct use of the software.

Short Clips: This is an outline of all of the skills that you need to be able to perform in the class. Each link is a small video (with no narration) that demonstrates the mechanics of each task. These are the videos that are in the outlines for each lab, and only show a specific skill, rather than a complete analysis.

Students with Special needs: Students with special needs who need academic accommodations should notify the instructor immediately (and no later than the second week of class).

Cheating: There is a risk of students cheating online. Because I am not present, there might be the temptation to turn in material that you did not produce. We have had students in previous semesters copy other students work, and then turn it in as their own. There are checks in place to prevent cheating and if you are caught you will receive a 0 for the lab. It really shows at the end of the semester when you are given your own research project. If you do not know how to perform the skills by the end of the semester, you will not be able to complete the final analysis and will not pass the class. Work together to understand, but do the work yourself.

Quizzes: Quizzes will be given online, or in the Lab. You may use outputs and other material from the class to answer the questions. The purpose of the quiz is to measure your ability to comprehend the material and use it in an applied setting.

Projects: There are two projects during the semester. A project is worth over 100 points and is based on the completion of the labs and the production of a word document describing your analysis. Details will be provided.

Final Exam: You will develop a hypothesis about student behavior from a literature search. You will then develop questions to ask introduction to psychology students. You will import data into SPSS and complete an analysis of the data.

Grading in the course: Your grade is based on the percentage of points that you earn during the course.

90% and above you receive an A
70% and above you receive a C

80% and above you receive a B
60% and above you receive a D

I round to two decimal places when I finish the grades, and it is important that you keep track of your grades so there are no surprises at the end of the semester. Here is a rough outline of the lectures and labs for the semester

PLEASE NOTE: Due to the nature of a class that has mathematics as the core element...This class can be difficult for some people, easy for others and boring for most. To get the most out of this class, you must come to class, and ask questions. Some of the best learning in the past has been driven by students who have reached that frustration/anger point. All students feel some sort of anxiety or stress about statistics, and if you hold it in, it will fester and make the class less enjoyable.

Here is an outline for the semester, if it changes it will change on the web first!

	Topic	Chapter	Skill
1/24/11	Welcome to class	None	Show up
1/26/11	Statistics Data	1	Graph different types of data
1/31/11	Show me the data	2	How to collect Data
2/2/11	Working with computers		
2/7/11	The Shape of your data	3	Finish data input
2/9/11	Exam 1		
2/14/11	The Normal Curve	4	Identify Parameters
2/16/11	Variations in Normality	5	Parameter limits
2/21/11			
2/23/11	Are you Normal?	6	z scores
2/28/11	Working with computers		All of the above
3/2/11	Correlations	12	Calculate z scores
3/7/11			Correlations and Regressions
3/9/11	Regressions	12	
3/14/11	Exam 2		
3/16/11	Parameters	7	Confidence intervals
3/21/11	Hypothesis Development		Comparing Means
3/23/11	Collect data		All of the above
3/28/11	Parameters	8	Paired sample t test
3/30/11	Parameters	9	Independent sample t test
4/4/11			
4/6/11	Reaction time papers Due		Organize Papers -
4/11/11	Exam 3		
4/13/11	Welcome to ANOVA	10	More than one level
4/18/11			
4/20/11			
4/25/11	Remember ANOVA	10	Follow up tests
4/27/11	More ANOVA	10	More one way ANOVA
5/2/11	Chi squared analysis	11	Assess parameters
5/4/11			
5/9/11	Put it all together.	Final Exam	Final Exam experiments
5/11/11	SLO Questions	Final Exam	Final Exam experiments
5/16/11			
5/18/11	Final Poster Session	Posters	Posters
5/23/11	Final Exam		

The Lab is blended in with the course. Here is a breakdown of the skills you are required to learn.

	Lab	Home Work
1/24/11	Log_into blackboard	
1/26/11	Make graphs using SPSS	Chapter 1 Short answers
1/31/11	Entering Data into SPSS	Chapter 2 Short answers
2/2/11	Checking Data	
2/7/11	Producing results tables	Chapter 3 Short answers
2/9/11		
2/14/11	Make histograms	Chapter 4 Short Answers
2/16/11	Make error bar graphs	Chapter 5 Short Answers
2/21/11		
2/23/11	Barbie dolls	Chapter 6 Short Answers
2/28/11	Humans	
3/2/11	Multiple regression	Chapter 12 Short Answers
3/7/11		
3/9/11		
3/14/11		
3/16/11	Make error bar graphs	Chapter 7 Short Answers
3/21/11	t tests	
3/23/11	Within / between subjects designs	Write Background
3/28/11	Paired sampled t tests	
3/30/11	independent sample t tests	
4/4/11		
4/6/11	Complete Final Paper	Turn in Document
4/11/11		
4/13/11	ONEWAY Analysis of Variance	Chapter 10 Questions
4/18/11		
4/20/11		
4/25/11	Tukey Tests	
4/27/11	Complete analysis	
5/2/11	Chi Squared Tests	Chapter12 Short Answers
5/4/11		
5/9/11	Put it all together!	Final Questions
5/11/11		
5/16/11		
5/18/11	Present projects	All done
<u>5/23/11</u>		

General College Calendar Spring 2011

Continuous until last day to add	Application Period
Continuous Through January 21	Program Advisement
November 15 - January 21	Registration
January 13	Drop for Non-Payment of Registration Fees
January 17	Holiday (Martin Luther King Day)
January 18 - 21	Professional Development - Organizational Meetings
January 21	Application Deadline
January 24	Regular Day & Evening Classes Begin
January 24 - February 4	Program Adjustment Period
February 4	Last Day to Add Semester-Length Classes
February 4	Last Day to Drop Semester-Length Classes Without a "W"
February 4	Last Day to Receive a Refund for Semester-Length Classes
February 7	Census Day
February 18 - 21**	Holiday (President's Day Weekend - Friday, Lincoln Day & Monday, Washington Day)
February 25	Last Day to Apply for P/NP (CR/NC) - Semester Length Classes
March 18	Last Day to Apply for Spring 2011 Degree/Certificate
March 18	End of First 8-Week Session
March 21	Second 8-Week Session Begins
April 15	Last Day to Drop Semester-Length Classes
April 18	Classified Staff Appreciation Day
April 18 - April 22	Spring Recess
April 22	District Employee Holiday (Good Friday)
May 20	End of Second 8-Week Session
May 23, 24, 25, 26, 27, 28 & 31	Final Examination Days