

Course Syllabus for Statistics for the Life Sciences: Fall 2010

Section: PSY 1728 and Bio 1046

Instructor: Steve Weinert

Room: H222

Time: 12:30 to 2:20 Monday and Wednesday with and an additional hour required on the Internet.

Text: Statistics Unplugged, Cadwell 3rd or 4th edition.

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: Bio 130 or 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: 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.

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 on-line 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.

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.

Assessments: Quizzes and labs will be given and graded on-line, 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. The total points for the semester can range between 500 and 600 points. Labs and the short answer questions are where the majority of the points are earned. Tests and quizzes are a small percentage of the total points possible. A + and – system will be used for percentages .02 percent above and .02 percent below each grade level.

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: 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!

Date	Day	Topic	Book	Online Lab
08/23/10	Monday	Go to Class, and deal with the crashing....	GET BOOK	Log in to blackboard
08/25/10	Wednesday	Get Semester Project	Open your book	Open SPSS at home
08/30/10	Monday	<i>Show me the data</i>	<i>Chapter 1</i>	Chapter questions 1
09/01/10	Wednesday	Show me the data p2	Chapter 1	Enter Data
09/06/10 Monday				
09/08/10	Wednesday	Parameters	Chapter 2	Chapter Questions 2
09/13/10	Monday	Identify Parameters SPSS LAB	Chapter 3	Chapter questions 3
09/15/10	Wednesday	Turn in Lab 1 and finish information		Exam 1
09/20/10	Monday	Probability	Chapter 4	Chapter Questions 4
09/22/10	Wednesday	Normal people / no so much	Chapter 5	Chapter questions 5
09/27/10	Monday	Other Distributions	Chapter 6	Chapter questions 6
09/29/10	Wednesday	How Normal are you? Your group?	Lab 2	Lab 2
10/04/10	Monday	<i>Finish Lab 2</i>		<i>Exam 2</i>
10/06/10	Wednesday	Experimental Design		
10/11/10	Monday	Hypothesis Testing	Chapter 7	Chapter Questions 7
10/13/10	Wednesday	More		
10/18/10	Monday	More	Chapter 8	Chapter Questions 8
10/20/10	Wednesday	More	Chapter 9	Chapter questions 9
10/25/10	Monday	Lab 3		Lab 3
10/27/10	Wednesday	Finish lab 3		Exam 3
11/01/10	Monday	<i>Exam 3 practicum</i>	<i>Midterm</i>	Get it done!!
11/03/10	Wednesday	ANOVA	Chapter 10	Chapter Questions 10
11/08/10	Monday	ANOVA	Chapter 11	Chapter Questions 11
11/10/10	Wednesday	ANOVA	Chapter 12	Chapter Questions 12
11/15/10	Monday	Finish Food data collection and entry		Make DATASET
11/17/10	Wednesday	Correlation	Chapter 13	Chapter Questions 13
11/22/10	Monday	Correlation	Chapter 13	
11/24/10	Wednesday	Regression		
11/29/10	Monday	<i>Regression</i>		
12/01/10	Wednesday	Final Exam		Final Exam
12/06/10	Monday	Write up final project		
12/08/10	Wednesday	Poster Presentation		
12/13/10	Monday	Final Project Due		Final analysis