Measurement and Data Analysis with Lab
Course Syllabus

MW 11:10-12:20, F 12:00-1:00
TTh 8:15-10:00 OR 10:10-11:55
Room: Olin 102/104

Professor Mija Van Der Wege
Office Hours: T1:30-3:30, F10-11:30, or by appointment
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Welcome to Psychology Boot Camp!

Understanding quantitative methods is central to becoming an expert in psychology. Through this course, lab courses, and a variety of content courses, the psychology major is designed not only to teach students the fundamental knowledge that has been accrued in the field of psychology, but also to teach students how that knowledge has been acquired. In this course, we will concentrate on a variety of topics regarding data analysis, including what kinds of data can be gathered, how different kinds of data can be analyzed, and the basic logic of hypothesis testing. In addition, we will also talk about how psychologists measure psychological concepts with confidence, specifically discussing the design and construction of surveys and how numerical analyses can contribute.

My hope is that, by the end of the course, you will have an appreciation of basic concepts of statistics that psychologists need in order to carry out their investigations. Specifically, I hope you will be able to read the “Results” sections of most journal articles in psychology or related fields, and more broadly, I’d like you to be able to read the New York Times or other news sources and be able to critically evaluate the numbers presented there. A second, related goal concerns computer literacy: I hope you will gain proficiency with Excel and SPSS, a spreadsheet and statistical computer program, respectively, in wide use in both academic and business circles.

While technically we have classes on Monday, Wednesday and Friday and lab on Tuesday and Thursday, I will be using our time together flexibly, using “lecture” days for computer work or “lab” days for lecture. The pacing of statistics can vary dramatically from class to class, so the course schedule is somewhat flexible as well. However, in general, we will be having one gradable assignment each week, alternating in-class quizzes with homework problem sets.

Textbook:

Course Requirements & Expectations:

Doing statistics is a skill much like playing the piano or doing gymnastics. Practice is thus a necessary prerequisite for the understanding and successful application of statistics. Some of this practice will start in class, but the bulk of it will have to be done as lab work, homework, and out of class practice and study. This is an 8-credit course, and my hope is that you will plan on devoting 12-16 hours a week outside of class on the course. Obviously, this practice is made easier when the assigned material is read and good notes are taken in class. Ultimately, however, the proof of understanding an idea is the ability to work through the appropriate exercises. I will be handing out a large number of practice problems. I encourage you to work through these problems until you feel comfortable with the concepts and the calculations.

Your final course grade will be based on your scores on weekly quizzes and homework (70-80%), class attendance (5-10%), and a final take-home exam (15-20%, approximately equivalent to two quizzes or homework assignments). Lab work and attendance will contribute to the lab grade. All homework, quizzes and exams will be cumulative, since most of the material covered in this class builds on what was learned previously.

Because of the cumulative nature of the course, I strongly encourage you to master any material with which you have had difficulty on a submitted quiz or homework assignment. You may earn back half of your missed points if you can demonstrate to me that you understand a concept fully, both through a discussion of the statistical concept and the correct completion of similar problems. You can only receive these make-up points in the week following the return of the quiz or homework. After that time, I would still encourage your mastery of the topics since most of the material learned is cumulative, but you may not earn any make-up points.

Website:

Course material will be available on Moodle. The syllabus will be updated frequently on-line. I will also put homework assignments, answer keys, additional readings, and other useful material on the course website as the term progresses.

Special Considerations:

If you need additional time on quizzes or to schedule to take a quiz early, you need to inform me at least two weeks in advance so that we can make the appropriate logistical arrangements.

Late work and Extensions:

The penalty for late homework is 5% per day. All homework assignments are due in class or online (on Moodle or in the COURSES folder) at the beginning of the class period when it is due, unless otherwise specified. Homework should be handed to the professor (not sent through Campus Mail or placed in my mailbox in Olin). Homework handed in after class has begun will be considered one day late. If you know in advance that you need to miss a quiz, please inform me well in advance so that we can arrange for you to take the quiz early. I do not give extensions on work, so please budget your time appropriately.
Academic honesty:

Review Academic Honesty in the Writing of Essays and Other Papers <http://webapps.acs.carleton.edu/campus/doc/information_students/academicohnesty> to educate yourself about plagiarism. Remember that plagiarism often results from carelessness or ignorance of applicable standards. Even in the absence of an improper intention, you may seriously violate standards of academic honesty; ignorance is not a suitable defense for violation of standards of academic honesty.

Carleton's academic honesty policy states: "It is assumed that a student is the author of all course work (quizzes, tests, papers, lab work, etc.) that he/she submits, whether for a grade or not."

DO:

• Help other students in the class understand concepts, procedures, and problems.
• Work with other students on practice problems.
• Use a calculator to figure hand calculations.
• Check any hand calculations that you do with a statistical program. All hand calculations must demonstrate all steps of the procedure followed.

DON’T:

• Do not allow other students to copy or consult your homework, homework answers, or homework-related computer results or printouts.
• Do not allow other students to copy or use computer work you have completed.
• Do not ask to see someone else's homework, homework answers, or computer printouts.
• Do not misrepresent others' work as your own.

Note that academic dishonesty not only includes cheating, fabrication, and plagiarism, but also includes helping other students commit acts of academic dishonesty by allowing them to obtain copies of your work. You are allowed to use the Web for reference purposes, but you may not copy material from any website or any other source without proper citations. In short, all submitted work must be your own.

Cases of academic dishonesty will be dealt with strictly. Each such case will be referred to the Academic Standing Committee via the Associate Dean of Students or the Associate Dean of the College. A formal finding of responsibility can result in disciplinary sanctions ranging from a censure and a warning to permanent dismissal in the case of repeated and serious offenses. The academic penalty for a finding of responsibility can range from a grade of zero in a specific assignment to an F for a final course grade.

A Final Note:

After all those warnings and prohibitions, it may seem as though the course will be a major hurdle, and students often dread taking statistics courses. It really needn't be onerous. Here's a secret: Despite the moaning and the gossip, there actually are some students who end up
enjoying this course, and who find their confidence in their own analytical skills bolstered by having taken it. My hope is that this will be true for each of you!

Please don't hesitate to come by office hours for questions, or to schedule appointments with Mija at other times. I am always happy to meet with students to talk about statistics or to go over some problems together. We could even do statistics over lunch or coffee, if your schedule is tight.

Course Schedule:

This is a rough outline of the course. I will generally adhere to this order of topics, although we may end up spending more or less time on certain subjects as the term progresses. There will be a number of homework assignments and in-class quizzes. Due dates will be given on the assignments. Quizzes will be announced in class at least a week in advance. The first quiz will be next Tuesday.

I would encourage you to read both the textbook and the supplementary handouts that I will be distributing. You might find it helpful to do the reading before lecture, after lecture, or both.

Week 1: Types of Variables; Chi-square Tests
   Cohen & Lea, Chapter 1, 9

Week 2: Descriptive statistics, Graphing
   Cohen & Lea, Chapter 1

Week 3: Probability and Probability Distributions
   Cohen & Lea, Chapter 1; Gonick & Smith, Chapter 3

Week 4: Confidence Intervals and Hypothesis Testing for 1 or 2 means
   Cohen & Lea, Chapter 2, 3, 9

Week 5: Effect size and power
   Cohen & Lea, Chapter 6

Week 6: Correlation and Simple Regression
   Cohen & Lea, Chapter 4, 9

Week 7: Multiple Regression; Survey design
   Cohen & Lea, Chapter 4, 9

Week 8: One-way ANOVA and post-hoc tests
   Cohen & Lea, Chapter 5

Week 9: Two-way ANOVA
   Cohen & Lea, Chapter 7, 8