Measurement and Data Analysis with Lab
Course Syllabus

Lecture: MW 9:50-11:00, F 9:40-10:40
Lab: MW 2:00-3:45, TTh 8:15-10:00, OR TTh 10:10-11:55
Room: Olin 102/104

Professor Mija Van Der Wege
Office Hours: T2;30-3:30, F10-11:30, or by appointment
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Prefect: Evan Anderson (andersone)
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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 different meetings assigned for classes and labs, I will be using our time together flexibly, occasionally 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.
Course Materials:
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.


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 10-12 hours a week outside of class on the course. Obviously, this practice is made easier when 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.

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 submitted via Moodle or 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. The penalty for late homework is 5% per day.

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.

Diversity:
I strive to create an inclusive and respectful classroom that values diversity. Our individual differences enrich and enhance our understanding of one another and of the world around us. This class welcomes the perspectives of all ethnicities, genders, religions, ages, sexual orientations, disabilities, socioeconomic backgrounds, regions, and nationalities.
Academic honesty:
If you have not done so already or recently, please review the College’s policy on Academic Integrity <https://apps.carleton.edu/campus/doc/integrity/>. 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.

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 Internet 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.

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.

Academic Support (http://apps.carleton.edu/campus/asc/):

The Prefect Program. The Prefect Program offers optional collaborative learning sessions for participating classes. Prefect sessions review course concepts and often focus on critical thinking and problem-solving exercises centered on the course material. Scheduled outside of class time, they are led by trained student leaders who have received the department’s or professor’s stamp of approval. All the sessions are free and open to all students enrolled in the class. Our course prefect(s) will use email or Moodle to inform everyone in the class about upcoming sessions (where, when, topics, etc.).
**Student Health.** Carleton College urges you to make yourself–your own health and well-being–your priority throughout this ten-week term and your career here. It is important to recognize stressors you may be facing, which can be personal, emotional, physical, financial, mental, or academic. Sleep, exercise, and connecting with others can be strategies to help you flourish at Carleton. If you are having difficulties maintaining your well-being, feel free to contact me and/or pursue other resources, such as Student Health and Counseling [http://apps.carleton.edu/studenthealth/](http://apps.carleton.edu/studenthealth/) or the Office of Health Promotion [http://apps.carleton.edu/healthpromotion/](http://apps.carleton.edu/healthpromotion/).

**Disability Accommodations.** Those who need academic accommodations should contact the Disability Services Office and me as soon as possible in the term, concerning either classroom, material and/or exam accommodations. Making arrangements to receive extra time on exams is your responsibility.

Carleton College is committed to providing equitable access to learning opportunities for all students. The Disability Services office (Burton Hall 03) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations. If you have, or think you may have, a disability (e.g., mental health, attentional, learning, autism spectrum disorders, chronic health, traumatic brain injury and concussions, sensory, or physical), please contact Chris Dallager, Director of Disability Services, by calling 507-222-5250 or sending an email to cdallager@carleton.edu to arrange a confidential discussion regarding equitable access and reasonable accommodations.

The Assistive Technologies program brings together academic and technological resources to complement student classroom and computing needs, particularly in support of students with physical or learning disabilities. Accessibility features include text-to-speech (Kurzweil), speech-to-text (Dragon) software, and audio recording Smartpens. If you would like to know more, contact aztechs@carleton.edu or visit go.carleton.edu/aztech.

**Extensions.** Extensions on assignments and make-up exams will not be given except in cases of medical or personal emergencies. Situations such as severe illness and family crises are grounds for a make-up exam or an extension. In these extreme circumstances, you should contact your class dean, and have them be in touch with me and your other professors. Having another assignment or exam due on the same day does not constitute a legitimate excuse. *If you miss class the day an assignment is due, it will be counted as late.* For individuals involved in extracurricular activities that may take them off-campus on the day a quiz or exam is scheduled, please inform me at least a week before a scheduled exam to make arrangements to take the exam early.
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. I love to do statistics over lunch or coffee!

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. 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.

The first quiz will be next Thursday.

Week 1: Types of Variables; Chi-square Tests
Cohen & Lea, Chapter 1, 9; Howell, Chapter 6

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

Week 3: Probability and Probability Distributions
Cohen & Lea, Chapter 1; Howell, Chapter 3 and 5; Gonick & Smith, Chapter 3

Week 4: Confidence Intervals and Hypothesis Testing for 1 or 2 means
Cohen & Lea, Chapter 2, 3, 9; Howell, Chapter 4, 7

Week 5: Effect size and power
Cohen & Lea, Chapter 6; Howell, Chapter 8, 17

Week 6: Correlation and Simple Regression
Cohen & Lea, Chapter 4, 9; Howell, Chapter 9, 10

Week 7: Multiple Regression; Survey design
Cohen & Lea, Chapter 4, 9; Howell, Chapter 15

Week 8: One-way ANOVA and post-hoc tests
Cohen & Lea, Chapter 5; Howell, Chapter 11, 12

Week 9: Two-way ANOVA
Cohen & Lea, Chapter 7, 8; Howell, Chapter 13, 14, 16