

Quantitative Methods for Psychological Sciences

CLPS0900 Syllabus
Semester I, 2013-2014

Class schedule:

Lectures: MWF 9:00 - 9:50 am
Location: 115 MacMillan Hall
Computer lab: 107 Metcalf

Instructor:

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Aims:

This course will help you to develop an appreciation for how statistics provide a means for understanding the world. By the end of the course you will be able to demonstrate knowledge of several statistical techniques including when to use them, how to use them, and what information they provide.

Course objectives:

This course provides a survey of statistical methods used in behavioral sciences and satisfies the quantitative requirement for psychology concentrations, foundation requirement for cognitive neuroscience concentration, statistical-analysis requirement for cognitive science concentrations, and may also be appropriate for other life or social sciences.

Topics to be covered include: descriptive statistics, probability, distributions, hypothesis testing, power, one- and two-sample inference, one-way and two-way analysis of variance, correlation, regression, and methods for categorical and rank data. The emphasis will be on understanding the assumptions of different statistical tests, learning which tests are appropriate for different types of data, gaining proficiency with statistical methods and software, and learning to report statistical results using American Psychological Association (APA) style.

By the end of the course you will be able to answer the following questions:

What are behavioral measurements (data)? How can data be visualized and summarized? What is hypothesis testing? Which statistical techniques are appropriate for analyzing different kinds of data? How are analyses computed? What conclusions can be drawn from analyses?

Text, readings, and lecture notes

Textbook: Howell (2014) *Fundamental Statistics 8th edition*. Wadsworth publisher.

Additional materials can be found on the textbook [website](#). Supplemental readings will be posted on the course [website](#).

Class meetings will include lectures, software demonstrations, and brief quizzes. Powerpoint slides from lectures will be posted on the course website. In-class handouts and website material are not a substitute for attending class, and if you do not attend lectures, you should not expect remedial help beyond what you would normally receive in office hours.

Exams and quizzes

There will be three exams; see the schedule. Each will include multiple choice items, brief definitions, and data analysis problems involving small sets of numbers. Sample questions will be posted before each exam. During exams, you may use hand-held calculators but not laptops, phones, or other electronic devices. If you miss either of the two 1-hour exams, you can take a make-up exam that is scheduled during reading period. No other make-up exams will be given. You must follow all College guidelines regarding incompletes. If you do not take the final exam, you will receive either an INC or ABS and will take the make-up exam that is proctored by the Registrar, typically at the beginning of the next semester. There will be no other make-up final exams for any reason.

Brief quizzes will be given to monitor student progress and help ensure mastery of the material. Of these, the two lowest scores will be discarded and the remaining scores will count toward your final grade. Make-up quizzes will not be given. Although some quizzes may be announced in advance, most will not be. The format of each quiz will be clearly stated when it is given.

Problem sets

Problem sets are a fundamental part of this course. One of their objectives is to provide you with experience using the statistical software you are likely to need in subsequent lab courses and independent research. Problem sets often involve large data sets and data analysis problems that are more realistic than problems on exams.

Computer lab hours and office hours

Drop-in lab hours in the departmental computer lab (107 Metcalf) will provide you with ample access to computers. You can also use these times to consult with TAs or collaborate with other students on your assignments. If you prefer to work on your own computer and have the relevant software installed on it, you may also use it during the drop-in lab hours. There are also additional hours each week when the computer lab is open to all students taking CLPS courses. In addition to drop-in lab hours, TAs have office hours in other locations. See the course website for locations.

Software & hardware

You will learn to use data analysis applications that are widely used in psychology. For problem sets, you will use SPSS or Excel. All necessary software will be provided on the workstations in the Metcalf computer lab. For work outside these times, you will also have access to computers in CIS and libraries. If you wish to use your own computers, you may do so but note the following: It is your responsibility to acquire and install all personal software. Brown does not have a site license for student downloads of SPSS, although you have the option to buy a short-term student license. SPSS is not available for all versions of Mac OSX. If you have your own installation of Excel, you may need to obtain statistical add-ons.

Materials cannot be stored on the computers in the computer lab so you should make sure you make a copy of your work. A flash drive is recommended, but you could email your work to yourself or use Dropbox or similar services.

You will need a scientific calculator that can compute sums, means, and sums of squares. Basic scientific calculators from HP or Texas Instruments are suitable, but calculator apps on cell phones are not. You should bring your calculators to every class and exam. You cannot expect other students to share their calculators. You are responsible for learning how to use your own calculator (don't throw out the manual!).

Participation in research

This course is one of several that contribute to the CLPS Dept. human subject pool. Students in these courses are expected to participate in ongoing research both as a way to learn about research methods and to help ensure that undergraduate and graduate students are able to carry out their honors and thesis work. To fulfill the research participation requirement, you are expected to participate in 3 hours of approved research over the semester. An online signup portal will post information about approved studies. Details on the subject pool procedures will be posted on the course website. If you do not wish to participate, you have the option of writing a brief paper about the Belmont Report. A third option is to attend 3 CLPS Dept. colloquia during the semester. Prof. Welch or a designated TA will have a class list for students to indicate their attendance at talks. Talks sponsored in other depts. will not count for this unless indicated otherwise. Please check the course website for a list of relevant talks.

Grading

Performance in the course will be assessed as follows: weekly problem sets (25%), quizzes (10%), first in-class exam (20%), second in-class exam (20%), and final exam (25%). If you complete one of the research participation options, you will have three points added to your weighted average for the course. Problem sets must be handed in to the TAs in class on the due date that is indicated on the course calendar and schedule. One-fifth of the value of each problem set will be deducted for each day it is late. Work submitted 5 or more days after the due date will not be graded. If you need a homework extension for medical reasons or Dean-approved excuses, you will need to provide a note from your doctor or the appropriate Dean.

Email, laptops, and other policies

Problem sets are not to be submitted by email unless you have made specific arrangements with the instructor or TA in advance. This is to avoid problems that arise when email is not received or cannot be read. Use email conservatively to ask questions; take advantage of office hours and class time to ask questions before using email. If you do email a question, include in the subject field the course (CLPS0900) and the topic of your message. Do

not expect an immediate response to your email; 12-24 hours is a typical response time. You are welcome to bring your laptop to class but only for reading handouts, note-taking, or running demonstrations. If students' laptop use disrupts the class, those students will be asked to sit at the back of the room. If that does not solve the problem, computer use in class will no longer be permitted.

Academic code and collaboration

Brown's Academic Code may be found [here](#).

For problem sets, you are allowed to collaborate with other students to some extent. Acceptable forms of collaboration include discussing concepts and methods used to solve a problem, and helping or receiving help from another student on how to import data sets and run software. Copying another student's work (with or without permission), copying syntax or other procedures for software, or having a student do the work for another constitute violations of the Brown Code. On each problem set you will be asked to identify any students you collaborated with.

For exams, you are not allowed to give or receive help of any kind; use notes, books, computers (this includes phones), or any other materials that are not authorized; copy or transmit the exam or answers. You are responsible for the answers you provide on quizzes, regardless of whether the work was done collaboratively or not.