PSYC BC1101 STATISTICS

Barnard College, Fall 2025

Professor: Dr. Rob Brotherton (rbrother@barnard.edu)
Office Hours: Wednesday, 9-10AM, 415M Milbank

Lecture time: Tu/Th 10:10-11:25AM
Lecture venue: 328 Milbank Hall

Section 001 recitation: Wed 10:10-12:00PM, 516 Milstein

Section 002 recitation: Wed 12:10-2:00PM, 222 Milbank Hall

Course Overview

This course, required for the psychology major, provides an introduction to statistical methods commonly used in psychological research. Topics include measures of central tendency and variability, probability and sampling, confidence intervals and hypothesis testing, t-test and analysis of variance, correlation and regression. In addition to learning the conceptual and mathematical underpinnings of these techniques, you will learn to calculate and interpret statistics with reference to real-world contexts and research questions typical in psychological research. The course includes recitation meetings that provide instruction in the analysis of psychological data using the R statistical coding language commonly used by behavioral science researchers.

The course is designed to fulfill these goals:

- Understand what statistics are, and why and when they are needed
- Translate observations about the world into statistical statements and questions
- Learn how statistical methods are used to test psychological hypotheses
- Use statistical software (R) to describe, visualize, analyze, and report data

Class Schedule

Date	Lecture / Recitation Topic
9/2/25	1: Course overview
9/3/25	*(no recitation first week)*
9/4/25	2: Variables & measurement
9/9/25	3: Frequency
9/10/25	Problem Set 1
9/11/25	4: Central tendency
9/16/25	5: Variability
9/17/25	Problem Set 2
9/18/25	6: z-scores
9/23/25	7: Probability
9/24/25	Problem Set 3
9/25/25	8: Sampling
9/30/25	Review
10/1/25	-
10/2/25	EXAM 1
10/7/25	9: Hypothesis testing
10/8/25	Problem Set 4
10/9/25	10: Hypothesis testing continued
10/14/25	11: the t-test
10/15/25	Problem Set 5
10/16/25	12: t-test continued
10/21/25	13: t-test: Independent samples
10/22/25	Problem Set 6
10/23/25	14: t-test: Related samples
10/28/25	Review
10/29/25	-
10/30/25	EXAM 2
11/4/25	*(no classes)*
11/5/25	Problem Set 7
11/6/25	15: ANOVA
11/11/25	16: ANOVA continued
11/12/25	Problem Set 8
11/13/25	17: ANOVA: Repeated measures
11/18/25	18: ANOVA: 2-factor ANOVA
11/19/25	Problem Set 9
11/20/25	19: Correlation
11/25/25	20: Regression

11/26/25	*(no classes)*
11/27/25	*(no classes)*
12/2/25	Putting it all together
12/3/25	Problem Set 10
12/4/25	Review
FINALS	EXAM 3

Course format

Video lectures

There are no required readings. Instead, you will be required to watch recorded lectures before attending the associated class session. You must watch the video lecture before attending the associated class session. These video lectures will be around 15 to 25 minutes each. They will include 'quizzes' that appear during the video, requiring your response before you continue with the lecture. So even though the videos themselves are short, you should plan to spend an hour or more with each one including the time it takes you to answer the questions and complete the exercises included along the way. Panopto keeps a record of your responses, and your engagement will be required and graded (see Grading).

Class time

Since you will have watched the recorded lecture in advance of class, class time will be devoted to review, activities, discussions, and your questions to help cement the understanding you will have begun to develop from the watching the lecture. Class activities are designed to build on the lecture you watched in advance; you will not be able to get the most out of the class without watching the associated lecture first.

Recitation

While the lecture component of the course covers the material conceptually, recitations will focus on practical application: performing statistical analyses using computer software, specifically R. No prior experience with R is required. For a quick primer, see this page. Problem sets will be accessed via RStudio Cloud, a free, web-browser-based version of the RStudio software interface that facilitates coding and running analyses using the R coding language. Instructions and advice will be self-contained in the problem sets as comments and pre-written demonstration code, and additional help and guidance will be available during recitation sessions. You will complete the problem sets by writing and executing code to answer the problems. Problem sets will be due at the end of your recitation period. You should plan to begin the problem set

in advance of recitation and come to recitation to receive assistance with any problems you run into or just to check you were doing things correctly and as effectively as possible.

Exams

There will be three multiple choice exams throughout the course (see class schedule). The exams will cover material from the lectures (not R). Each exam will cover approximately one-third of the course material. The lecture before each exam will be set aside for a review discussion. Also, on weeks with exams, there will be no recitation problem set due.

Expected workload

The college usually expects each course credit to correspond to 3 hours of work in and/or outside of the classroom. Since this is a 4 credit course, that means a commitment of 12 hours per week. The in-person component consists of 2 lectures per week and one recitation, totaling 4.5 hours. Outside of class, you will watch recorded lectures (and complete associated quizzes/open-response questions) and work on problem sets before the associated classes, adding another ~5 hours. Revision for exams, participation via the class notes Google Doc, checking over graded problem sets, attendance of office hours, etc, will constitute the remainder of your time spent on this course.

Grading

Your final grade will be based on your scores for each of the following components, weighted as follows:

- Exams: 50%
- Problem Sets: 30%
- Participation: 20%

Numeric scores will be rounded up or down to the nearest whole number and letter grades will be determined according to the following boundaries:

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Letter grade:  A+ A  A- B+ B  B- C+ C  C- D  F
Numeric score: 97 93 90 87 83 80 77 73 70 60 <60
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Participation

Participation across the semester will contribute 20% of your final grade. Participation includes your engagement with the Panopto lectures and their in-lecture questions, as well as coming to class and recitation prepared to discuss and ask questions about the lecture and recitation material. You will be able to earn a passing grade by watching the lectures and completing the in-lecture quizzes, though earning an outstanding grade (i.e, A+) will require regular participation in discussions.

Problem Sets

In total, the Recitation Problem Sets will contribute 30% of your final grade. Problem Sets will be due at the end of your recitation session. For each Problem Set, you will receive a grade of 0, 1, or 2, where 0 means you didn't submit it; 1 means a submission with substantial omissions; and 2 means a valid, complete attempt. Note that in R, there is often more than one way to arrive at a correct solution. This grading scheme is intended to encourage you to explore different ways of doing things and take your best shot at solving all the problems, even if you are unsure whether you are doing things correctly. Full credit will be given where effort has been made, even if the answers are incorrect. You can show the effort you made, as well as highlighting aspects you don't find clear, by commenting your code thoroughly.

Exams

The 3 multiple choice exams (see dates in class schedule) will contribute a total of 50% of your final grade.

Additional Resources

Empirical Reasoning Center

If you feel like you need guidance with R outside of Recitation & office hours you can meet with fellows at Barnard's Empirical Reasoning Center. Many of the fellows specialize in R and have walk-in hours. https://erc.barnard.edu/

Academic Accommodations and general wellness

It is always important to recognize the different pressures, burdens, and stressors you may be facing, whether personal, emotional, physical, financial, mental, or academic. The current circumstances may well add to these challenges for many people in many ways. The college

recognizes this, and is prepared to provide assistance to students in need. Many of the available services and sources of help are being reshaped in response to the changing circumstances. Rather than include boilerplate text here or link to sources of information which may become outdated, I encourage you to seek advice from your advisor, Dean, or the Center for Accessibility Resources & Disability Services (CARDS), and to let me know of any issues you wish to share with me that you feel are impacting your ability to complete the course to the best of your ability.