

PSY1900: Introduction to Statistics for Behavioral Sciences

Location	TBD	Instructor	Haley Keglovits, Ph.D.
Time	MW 1:30–2:45 PM	Email	hkeglovits@fas.harvard.edu
Office Hours	TBD	Canvas	Link

Course Description: *An introduction to statistics used in psychology and other behavioral sciences, with applications to industry-facing data science roles. Emphasizes conceptual understanding of key statistical principles and develops hands-on data analysis skills using the statistical programming language R. Topics include measures of central tendency and variability, probability and distributions, as well as hypothesis testing and data exploration (including chi-square tests, t-tests, correlation, analysis of variance, and regression). Includes a lab section focused on applying these methods to behavioral data.*

By the end of this course, you will be able to answer...

- Why do statistics matter if I want to study psychology?
- What does “significant” mean? How is it used in research and by the general public?
- What can I learn from statistical tests? How can I calculate statistical properties of a dataset?
- How do I choose a statistical test to answer my questions? What are their limitations?
- How can I visualize a dataset, and communicate it to others? What makes a good visualization?
- What is R? How can I use it? Is programming as hard as it seems? (no!)
- How should I interpret statistical information I encounter in the wild?

Administrative Requirements for Course Participation

A lab section: lab slots will be posted and you must enroll in one to take part in the course.

Lecture attendance: quizzes will take place at the start of class time most Wednesdays; no lecture recordings.

A laptop: it must be able to run R and R studio; this is basically any modern machine (including a chromebook).

Tablets may be appropriate, speak to me week 1 if this is what you have.

Basic calculator: not a graphing calculator! See [this page] on canvas for the difference. If this purchase is a hardship, please let me know ASAP because the department has a few available for loan.

Course Assignments

Lab Assignments (10%): Practice of weekly concepts in collaboration with a TF and your classmates. Due at the end of each lab section, graded on completion. Your lowest lab grade will be dropped.

Homework (10%): Application of weekly concepts through a problem set, completed individually (i.e., without classmates or AI). Due on Sunday night at 11:59 PM and graded on completion (including showing your work). Your lowest homework grade will be dropped.

Quizzes (15%): Short in-class assessments of the concepts from the previous week (ex: quiz 6 covers regression and multivariate topics); completed individually at the start of class on Wednesdays. You will use your calculator for these! Your lowest quiz grade will be dropped, and your second lowest will count for half. Relevant mathematical formulas will be provided.

Exams (45% total): Three longer assessments which focus on content taught since the last exam (ex: exam 3 will not have questions focused on correlations). However, it is worth remembering that topics will build on each other, so you may use previous concepts on an exam even if it is not the primary focus of a question (ex: you can't forget how to calculate averages after exam 1). Exams are worth 15% of your total grade each. You will be provided with a formula sheet which will be available during the exam.

Final Practical (20%): The final for this course will require working with a dataset using R during an exam block in person. The content will be a summation of what you have learned in this course, simulating how you would actually use your skills with a psychological dataset. This will be an in-person assessment; more details about timing will be provided when we are assigned our exam slot.

Course Schedule

Week	Monday 1:30 - 2:45 PM	Wednesday 1:30 - 2:45 PM	Lab (W/T/F)	HW Due Sun.	Reading Chapters
1	Jan 26 Why Statistics?	Jan 28 Variables	R Intro	HW 0	1, 2, 3
2	Feb 2 Data Visualization	Feb 4 QUIZ 1 , Summarizing Data	Plotting Data	HW 1	5 [skip 5.7], 6
3	Feb 9 Probability and Standard Distribution	Feb 11 QUIZ 2 , Sampling and Confidence Intervals	Probability	HW 2	9, 10
4	Feb 16 <i>Holiday, No class**</i>	Feb 18 EXAM 1	<i>no lab</i>	**Special Review Session Tuesday @ Time TBD	
5	Feb 23 Hypothesis Testing	Feb 25 χ^2 Testing	Hypotheses and χ^2	HW 3	11.1-11.7, 12
6	Mar 2 One group T-tests	Mar 4 QUIZ 3 , Two group T-tests	T-Tests	HW 4	13.1-13.8
7	Mar 9 Correlations	Mar 11 QUIZ 4 , Anormality	Correlations	HW 5	5.7, 13.9-13.11
8	<i>Spring Break, no class</i>				
9	Mar 23 Review	Mar 25 EXAM 2	<i>no lab</i>		
10	Mar 30 ANOVA	Apr 1 Post-Hoc Testing	ANOVA pt. 1	HW 6	14
11	Apr 6 Regression	Apr 8 QUIZ 5 , Multivariate	Regression	HW 7	15
12	Apr 13 Factorial ANOVA	Apr 15 QUIZ 6 , ANOVA Design Balance	ANOVA pt. 2	HW 8	16
13	Apr 20 Power Analysis	Apr 22 QUIZ 7 , Ethics	Big Data	HW 9	11.8-11.9
14	Apr 27 Review	Apr 29 EXAM 3	<i>no lab</i>		

Reading Period: April 30 - May 6

Final Practical date TBD: May 7 - May 16

Grade Breakdown

B+: 87.0–89.9	C+: 77.0–79.9	D+: 67.0–69.9
A: 93.0–100.0	B: 83.0–86.9	C: 73.0–76.9
A-: 90.0–92.9	B-: 80.0–82.9	C-: 70.0–72.9
		D: 63.0–66.9
		E: <59.9
		D-: 60.0–62.9

Course Policies

Office Hours

Office hours are designated times that I set aside to engage with your questions or thoughts that may come up during class or on assignments. You are welcome to come talk to me about the course, the intersection of statistics and psychology, or even what it is like to do a Ph.D. The default format is a drop-in basis (meaning you do not have to stay for the whole hour, you can come and go as you please, and you do not need to tell me ahead of time that you will come) and is designed for your benefit. Because of this open-door nature, please shoot me an email ahead of time if you would like to discuss something without others present, and we can schedule a specific slot so you are not interrupted. *Time/location and TF office hour details will be posted at the start of the semester.*

Textbook: *Learning Statistics with R* by Danielle Navarro

We will use a textbook which is available for free [entirely online!](#) It is even available in [more](#) than one [format](#), depending on how you like to read. Purchasing a copy of the textbook is not required; however if you prefer having a physical book it is available from online retailers and the COOP. The readings assigned each week will cover the content we go over that week in class. I recommend reading the book before attending lecture, but I know for some students the other order is more useful. If something is in the book that we don't cover in class or lab, you do not have to worry about it (ex: there might be mentions of Bayesian statistics here and there).

Late/Missing Assignments

I know things happen in life that interfere with your academics, which is why I build in the dropped assignments (your lowest lab, homework, and quiz grades). This does not require any documentation on your part and will be calculated automatically. However, due to the way topics build on each other, we cannot accept any late assignments or provide opportunities for make-up work. You will want the solution to your homework assignments ASAP so you can study for your quizzes; if extensions were offered, we wouldn't be able to post solutions in time for them to be useful for your studying.

This policy also exists because requiring people to request an exception, rather than receiving one automatically, can be inherently unfair. Certain demographic groups, such as students experiencing mental health or other stigmatized challenges, are often less likely to ask for exceptions to class policies (PMID: [34725153](#), [18378834](#), [31008459](#)). [Thank you Dr. Jenn Segawa for this section!]

Makeup exams are given only in emergency and pre-arranged cases. Any make-up exam will be given at my discretion, in coordination with your Resident Dean. If you find that you will miss or have missed an exam, please contact me – and cc your Resident Dean – as soon as you can with appropriate documentation.

If you're dealing with a situation that has caused you to miss more than one quiz/homework/lab, that probably means that it is something that should be approached in coordination with your Resident Dean and/or the Disability Access Office. I'm happy to help you with those processes; please just let me know by email or during office hours.

Classroom Environment

Research shows that using electronic devices in class can reduce focus and lead to more superficial learning, not just for the person using the device, but for others nearby. For that reason, I ask that if you choose to take notes with a laptop you please sit in our designated 'electronics' section, to not distract others. During quizzes and exams, all electronics (including smart watches) and other objects (food etc.) will need to be put away.

I know I've been guilty of thinking I'll be able to have my laptop out and not be distracted, just to find myself doing other work/email/sudoku five minutes later, so I encourage you to think carefully about how you want to take notes for this course and check in on your choice throughout the semester!

Academic Integrity

Plagiarism is implicitly or explicitly taking credit for something that is not yours. In this course, except for lab assignments when I encourage you to collaborate with your classmates (but not AI!), all work must be completed individually. This means the use of friends, paid help, and generative AI tools is not allowed on homeworks and

all exams, including the final practical. Submitting someone else's work not only risks academic consequences (including referral to the Honor Council), but it also cheats you out of the education you're investing your time and energy in. [Harvard's Honor Code || FAS Handbook for Students](#)

I know that you will have access to AI for the rest of your life, and I know AI can do the statistical analyses we're learning in this course. However, your goal in this class is to learn to perform them yourself, so that you can be an informed statistics user in the future (whether those are from AI or elsewhere). We will discuss generative AI on the first day of class.

Accommodations and Support

If you have academic accommodations through the Disability Access Office (DAO), please share your letter with me by the end of the second week of the term so we can make sure you get support. If you do not have formal accommodations yet but have concerns about completing assignments or staying on track in this class, I encourage you to reach out to me so we can discuss campus resource options. I'm always happy to talk during regular office hours or by scheduling a one on one, and our conversations will remain private. In some cases, I may need to consult with DAO to make sure we're applying accommodations appropriately or connecting you with the right resources. My goal is always to support your learning and help you do your best. If something changes during the semester, please come talk to me as soon as possible.

Helpful Resources

Counseling and Mental Health Services: The Harvard Counseling and Mental Health Services offer a variety of services to address any concerns or additional support you may need. To see options for help, see <https://camhs.huhs.harvard.edu/>. You may also call their 24/7 help line at 617-495-2042 (<https://camhs.huhs.harvard.edu/our-services/camhs-cares-line/>).

The Academic Resource Center: The Academic resource center at Harvard offers a wide variety of services to support students in their academic goals. These include peer tutoring, workshops on learning and study strategies, setting study groups, or planning a senior thesis. For more information, visit them at <https://academicresourcecenter.harvard.edu/>.

The Mignone Center for Career Success (MCS): empowers our learners to identify, explore, and achieve their career and professional goals, wherever they may lead. <https://careerservices.fas.harvard.edu/channels/eresources>.

Boston Food Bank: <https://www.gfb.org/need-food/>.

Financial Resources: As a Harvard student, you have access to financial resources and opportunities at the University. The programs and policies listed on this page are designed to help you take advantage of those opportunities during your four years at Harvard. We always encourage you to contact the Griffin Financial Aid Office and speak with a financial aid officer if you have any questions. <https://college.harvard.edu/financial-aid/additional-funding-procedures/>.