

PSY305H1 S

The Treatment of Psychological Data

Winter 2024 Syllabus

Course Meetings

PSY305H1 S

Section	Day & Time	Delivery Mode & Location
LEC0101	Tuesday, 10:00 AM - 1:00 PM	In Person: UY 17198

Refer to ACORN for the most up-to-date information about the location of the course meetings.

Course Contacts

Course Website: <https://q.utoronto.ca/courses/339153>

Instructor: Jun Young Park

Email: junhy.park@utoronto.ca

Office Hours and Location: Tuesdays, 2-3PM, in person. Fridays, 9-10AM, online.

Teaching Assistant: Nick Hoang

Email: nick.hoang@mail.utoronto.ca

Office Hours and Location: To be announced; held online

Course Overview

This course provides a practical yet intensive introduction to the research pipeline, with a focus on research data management and advanced statistical analysis and inference. Students learn how to find, organize, and analyze data sets in a transparent and reproducible way. Students also learn more about statistical inference, focusing on how the design and analysis of data shape the interpretation of results.

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Up through now, you have learned the basics of how we use statistics to derive meaning from scientific data. This class will translate that knowledge into action. The goal of this class is twofold, depending on what you want to do when you graduate. This class will either: (a) Teach you how to be a graduate student in psychology; (b) Teach you how to be an active, data-driven citizen. You will learn how to manage data in a way that is well-reasoned and conducive to

statistical analysis. You will make decisions on how best to analyze data — a problem that rarely has only one correct answer — and you will learn how to justify your decisions. You will embrace the process of reporting statistical results in a clear and reproducible way. You will also learn how to simulate data to help anticipate your analyses before you collect your data and estimate statistical power. Writing will also be a big part of this class, as you will learn how to report statistical results to both scientific and popular audiences. Altogether, you should emerge from this class being able to follow the process of data analysis from a raw dataset to a publishable final report, being able to readily share this process with others in a clear, open, and reproducible way.

Course Learning Outcomes

By the end of the course, students will be able to

- understand challenges in defining good measures of psychological traits.
- understand the following statistical concepts: Type 1 error, Type 2 error, power, effect size.
- distinguish what can or cannot be deduced from statistics.
- use appropriate statistical methods to address a research question, compute required sample size, report the effect size.
- understand recent concerns on replicable research in the field of psychology.
- track recent challenges in pursuing open science in research.
- include necessary materials for pre-registration.
- use R script to produce transparent and reproducible data analysis pipelines.

Prerequisites:

PSY202H1/ECO220Y1/SOC252H1/STA221H1/PSY202H5/STA221H5/PSYC08H3/STAB27H3/STAC32H3

Corequisites: None

Exclusions: EEB313H1

Recommended Preparation: None

Credit Value: 0.5

Course Materials

- Lecture slides will be uploaded to Quercus before the lecture. I acknowledge that some parts of the slides are adapted from the course contents prepared by Dr. Elizabeth Page-Gould, which is available at <https://osf.io/z6mp4/>.
- Reference papers would be guided at the Quercus.
- No textbooks are required for purchase. Some (optional) reference textbooks that would be used frequently would be:
 - *Science Fictions: How Fraud, Bias, Negligence, and Hype Undermine the Search for Truth* by Stuart Ritchie
 - *Statistical Thinking for the 21st Century* by Russell A. Poldrack (available [here](#))

- *The Essential Guide to Effect Sizes: Statistical Power, Meta-analysis, and the Interpretation of Research Results* by Paul D. Ellis (available for free provided by [University of Toronto Library](#))
- *Statistics Without Maths for Psychology* by Christine Dancey and John J. Johnston
- *Research Methods in Psychology* by Beth Morling

Marking Scheme

Assessment	Percent	Details	Due Date
Assignments	5%	The best 5 assignment grades (out of 6) will be used, weighted to scale up to 30% of the final grade. Discussions with peers are allowed and encouraged, but these are to be completed (written up) on your own.	2024-01-22
Assignments	5%	The best 5 assignment grades (out of 6) will be used, weighted to scale up to 30% of the final grade. Discussions with peers are allowed and encouraged, but these are to be completed (written up) on your own.	2024-01-25
Assignments	5%	The best 5 assignment grades (out of 6) will be used, weighted to scale up to 30% of the final grade. Discussions with peers are allowed and encouraged, but these are to be completed (written up) on your own.	2024-02-05
Assignments	5%	The best 5 assignment grades (out of 6) will be used, weighted to scale up to 30% of the final grade. Discussions with peers are allowed and encouraged, but these are to be completed (written up) on your own.	2024-02-26

Assessment	Percent	Details	Due Date
Assignments	5%	The best 5 assignment grades (out of 6) will be used, weighted to scale up to 30% of the final grade. Discussions with peers are allowed and encouraged, but these are to be completed (written up) on your own.	2024-03-11
Assignments	5%	The best 5 assignment grades (out of 6) will be used, weighted to scale up to 30% of the final grade. Discussions with peers are allowed and encouraged, but these are to be completed (written up) on your own.	2024-03-25
R workshop	5%	Students are required to report the grades of the "Introduction to R" tutorial, an online, self-paced course administered through Quercus. Students need to save the grade page as a pdf form. Out of 16 possible points in the tutorial, points ≥ 10 will qualify for 5%, points ≥ 8 will qualify for 4%, and so on.	2024-01-20

Assessment	Percent	Details	Due Date
Participation	5%	Credits will be given based on participation in class. "Participation" is defined by one of the following: (i) Responses to questions asked by the instructor, or (ii) questions to course contents. It excludes clarification questions (e.g. "could you explain it one more time?" or "I don't get that".) The "participation count" is defined by the number of classes you participated in discussion points made by the instructor, or asked insightful questions in class. Students with participation counts ≥ 6 will qualify for 5%, and counts ≥ 4 will qualify for 3%, and counts ≥ 2 will qualify for 1%. Students with participation counts ≥ 8 will get 2% extra (bonus) credits.	No Specific Date
In-Person Final Exam	60%		Final Exam Period

Absence of declaration / Verification of illness

- If you become ill and it affects your ability to do your academic work, consult the instructor right away. Normally, documentation in support of your specific medical circumstances is needed. It can be an Absence Declaration (via ACORN) or the University's Verification of Student Illness or Injury (VOI) form. The VOI indicates the impact and severity of the illness, while protecting your privacy about the details of the nature of the illness. You can submit a different form (like a letter from a doctor), as long as it is an original document, and it contains the same information as the VOI. For more information on the VOI, please see <http://www.illnessverification.utoronto.ca/> for the most recent university policy. For information on Absence Declaration Tool for A&S students, please see <https://www.artsci.utoronto.ca/absence>. If you get a concussion, break your hand, or suffer from some other acute injury, you should register with Accessibility Services as soon as possible.

Accommodations

- If you have a disability or health consideration that may require accommodations, please contact Accessibility Services at <https://studentlife.utoronto.ca/as> or (416) 978-8060. For students being supported by Accessibility Services, it is recommended (though not required) to keep the instructor updated so that individualized assistance or

accommodations (beyond the ones offered by AS) can be applied if needed. All information related to privacy or health conditions must not be shared.

Re-grading requests

The TAs and I work very hard to grade assignments fairly and thoughtfully. Please wait at least 24-36 hours before reaching out to us. If you believe an assignment has received a grade in error, you may submit an appeal. An appeal must be submitted within 14 days after the graded assignment is made available to students. Documents submitted for an appeal will be re-graded in their entirety. As a result, your grade may increase, but it may also stay the same or even decrease.

Late Assessment Submissions Policy

There will be a 1% deduction in the final course grade every 24-hour period past the deadline. Valid forms for requesting extensions without penalties will be Absence Declaration, VOI, or equivalent. Once these forms are submitted, the instructor will determine an appropriate extension.

Policies & Statements

Attendance

Attendance is not counted towards the final grade of the course. Please note, however, that there are participation credits that would count, which would be given to students attending the lectures in person.

Additional Content

Software

- We will use R throughout this course, a statistical software that is publicly available for free at <https://mirror.csclub.uwaterloo.ca/CRAN/>.
- It is also highly recommended to install RStudio (<https://posit.co/downloads/>) for an interactive programming environment.
- Note that the University of Toronto offers an open-source web application to use R and R studio: <https://r.datatools.utoronto.ca/>

Sharing Course Materials

- Sharing course materials **require the instructor's permission.**

Getting Help with the Course

- The best way to ask questions about the course materials and administrative issues is to ask directly to me during (or after) the lecture. I am open to answering any questions during the lecture.
 - Based on the previous year, **there is a very strong correlation between class participations and final grades** (Pearson correlation=0.47, p-value=0.018).
- You may also use office hours to ask questions about the course materials or assignments.
- You may also use Piazza to ask questions on course materials and administrative issues, but please note that it may take some time to get a response.