

PSYC*6940 - Discrete-Variable Research Design and Statistics

Fall 2024 Course Outline

Section: 01

Credits: 0.50

Land Acknowledgement: Guelph

The University of Guelph resides on the ancestral lands of the Attawandaron people and the treaty lands and territory of the Mississaugas of the Credit. We recognize the significance of the Dish with One Spoon Covenant to this land and offer respect to our Anishinaabe, Haudenosaunee and Métis neighbours. Today, this gathering place is home to many First Nations, Inuit, and Métis peoples and acknowledging them reminds us of our important connection to this land where we work and learn.

Calendar Description

This course is an in-depth examination of statistical approaches used in psychology, with an emphasis on experimental research designs with discrete independent variables (e.g., t-test, ANOVA, general linear model), and how these approaches address ongoing statistical challenges faced by psychological researchers, such as replication and generalizability.

Restriction(s): **Restricted to Psychology students.**

Department(s): **Department of Psychology**

Lecture Schedule

Mon 8:30am-11:20am in MCKN*119 (9/5 to 12/13)

Instructor Information

Naseem Al-Aidroos

Email: naseem@uoguelph.ca

Office: MacKinnon Extension Room 4018

Office Hours:

Drop-in Wednesdays from 2:30-3:20pm

Textbooks

Group	Title	Author	ISBN
Required	Readings posted to CourseLink		

Course Level Learning Outcomes

Students will be able to, within the context of psychological research:

1. Understand and describe the statistical concepts behind the general linear model, in particular as applied to t-tests, ANOVAs, and the Pearson correlation coefficient.
2. Understand and describe the strengths and weaknesses of null-hypothesis testing (NHST).
3. Apply knowledge from (2) to judge when NHST approaches are appropriate.
4. Choose modern solutions that can overcome the limitations of NHST for a given statistical context, such as confidence intervals, registered replications, meta-analyses, and resampling.

5. Understand and describe the differences between NHST and Bayesian statistical approaches; in particular the types of conclusions each approach affords.
6. Write a results section reporting both NHST and Bayesian analyses of psychological data using proper APA format.
7. Create effective visual depictions of data analyses
8. Select and learn new statistical software as needed

Schedule of Topics and Assignments

Day	Date:	Topic	Activities	Due
Mon	9/9	01. Overview, distributions, and Excel basics		
Mon	9/16	02. Simulating and describing samples		
Mon	9/23	03. Central Limit Theorem and p-values		
Mon	9/30	04. General Linear Model		
Mon	10/7	Class cancelled		
Mon	10/14	Thanksgiving Holiday		
Mon	10/21	05. Practical considerations when using ANOVA	Assign. 1 Error Bars Due Friday	
Mon	10/28	06. The psychology replication "crisis"		
Mon	11/4	07. The New Statistics--hypothesis tests vs. parameter estimation		
Mon	11/11	08. The New Statistics--meta-analysis	Assign. 2 Position Paper Due Friday	
Mon	11/18	09. Bayesian approaches--Theory and hypothesis testing with Bayes factors		
Mon	11/25	10. Bayesian approaches--Practice and implications for replication crisis 11. Open science *** Friday Nov 29	Take Home Exam Released Monday Assign. 3 Results Section Due Friday	

Teaching and Learning Activities

Weekly Activities

In-class lectures and recorded lectures: **Some lectures will take place in-class, and some may be pre-recorded, with class time being used for discussion of the lecture.**

Missed Lectures: **Lectures will both introduce new material (i.e., not covered by the assigned readings) and provide opportunities to apply statistical techniques to example problems. Accordingly, attendance and participation are particularly important for this course. The participation component of the final grade is based on the percentage of attended lectures. One class can be missed without penalty; this policy is designed to facilitate attending academic conferences. Please note that if you miss a lecture, it is your responsibility to seek out the information you missed (e.g., sharing notes with classmates, or visiting during office hours).**

Final examination date and time: **The final assessment is a take-home exam. It will be released on Nov 25, and is due at 11:59pm on Dec 6.**

Assessment Breakdown

{NOTE: instructor can add another row by hitting "TAB" button when they are at the end of the row}

Description	Weighting (%)	Due Date
Assignment #1 Error Bars	20%	Friday Oct 25
Assignment #2 Position Paper on the New Stats	20%	Friday Nov 15
Assignment #3 Results Section	20%	Friday Nov 29

Participation	20%	
Take-home Exam	20%	Friday Dec 6

Last Day to Drop Course

The final day to drop Fall 2024 courses without academic penalty is the last day of classes: **November 29**

After this date, a mark will be recorded, whether course work is completed or not (a zero is assigned for missed tests/assignments). This mark will show on the student's transcript and will be calculated into their average.

Course Grading Policies

Submission of Assignments

Assignments and exams must be submitted through the associated Drop Box on CourseLink by 11:59pm on the due date.

Late Assignment

Late submissions will not be accepted for any course components. Any assignments or exams not submitted by the assigned due date will receive a grade of 0%. Please contact the instructor immediately if you are going to miss a due date.

Course Policy on Group Work

Assignments must be completed on an individual basis. Collaborations among students for the purposes of writing assignments are prohibited. Any student(s) suspected of unauthorized collaboration will be reported to the Dean's Office for an academic misconduct investigation (see Policy on Cheating & Academic Misconduct below). Note: It is permissible to talk with fellow students to facilitate understanding the material needed to complete an assignment; however, you must write the assignment independently.

CSAHS Graduate Academic Misconduct Policy

The *Academic Misconduct Policy* is detailed in the Graduate Calendar. The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Standard Statements for Graduate Courses

Academic Integrity

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Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/academic-misconduct/>) is outlined in the Graduate Calendar.

Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Use of the SAS Exam Centre requires students to make a booking at least 10 business days in advance, and no later than the first business day in November, March or July as appropriate for the semester. Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time. For students at the Guelph campus, information can be found on the SAS website. (<https://www.uoguelph.ca/sas/>)

Accommodation of Religious Obligations

If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements.

See the Academic calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/academic-accommodation-religious-obligations/>)

Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Drop Date

Courses that are one semester long must be dropped by the end of the last day of classes; two-semester courses must be dropped by the last day of classes in the second semester. The regulations and procedures for Dropping Courses (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/registration/>) dropping courses are available in the Graduate Calendar (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/registration/>).

Email Communication

As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

Health and Wellbeing

The University of Guelph provides a wide range of health and wellbeing services at the Vaccarino Centre for Student Wellness (<https://wellness.uoguelph.ca/>). If you are concerned about your mental health and not sure where to start, connect with a Student Wellness Navigator (<https://wellness.uoguelph.ca/navigators/>) who can help develop a plan to manage and support your mental health or check out our mental wellbeing resources. (<https://wellness.uoguelph.ca/shine-this-year/>) The Student Wellness team are here to help and welcome the opportunity to connect with you.

Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

Recording of Materials

Presentations that are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources

The Academic Calendars (<http://www.uoguelph.ca/registrar/calendars/?index>) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the Graduate Calendar for information on regulations and procedures for Academic Consideration (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/grounds-academic-consideration/>).