

# PSY202H1S: Statistics II

Department of Psychology, University of Toronto

January 5, 2024

## 1 About this course

Fundamentals of statistical analysis of experimental and observational data including linear models, the analysis of variance, post-hoc tests, power analysis and effect size calculations. Link to course description: <https://artsci.calendar.utoronto.ca/course/psy202h1> and link to course content: <https://q.utoronto.ca/courses/339073>

## 2 Contacts

### 2.1 Course Instructor (CI)

M. Eric Cui, Ph.D. candidate

Email: [mo.cui@mail.utoronto.ca](mailto:mo.cui@mail.utoronto.ca)

Virtual Office: <https://utoronto.zoom.us/j/9414318637>

Office Hours: Fridays noon - 1PM or *by appointment*

### 2.2 Teaching Assistants (TAs)

Jennet Baumbach, TUT0101, Tuesdays 2-3PM, [jennet.baumbach@mail.utoronto.ca](mailto:jennet.baumbach@mail.utoronto.ca)

Stephanie Simpson, TUT0201, Wednesday 11AM-noon, [stephanie.simpson@mail.utoronto.ca](mailto:stephanie.simpson@mail.utoronto.ca)

Sophia Zhao, TUT0103, Wednesday 5-6PM, [sophiayt.zhao@mail.utoronto.ca](mailto:sophiayt.zhao@mail.utoronto.ca)

Gaqi Tu, TUT5101, Thursday 9-10AM, [gaqi.tu@mail.utoronto.ca](mailto:gaqi.tu@mail.utoronto.ca)

Jennet Baumbach, TUT5102, Thursday 7-8PM, [jennet.baumbach@mail.utoronto.ca](mailto:jennet.baumbach@mail.utoronto.ca)

### 2.3 Methods

#### 2.3.1 Email

If you have questions about this course, please send an email to [psy202.2014w@gmail.com](mailto:psy202.2014w@gmail.com). However, if you have a specific question related to your tutorial, feel free to email your TA. In the email subject line, please include "PSY202" along with the topic of your inquiry. Always use your UofT email addresses, as they are governed by the University's codes of conduct. We will do our best to respond to your emails within 2 business days; however, response times may vary depending on the volume of emails we receive. For instance, we are likely to receive more emails leading up to exam periods. If you do not receive a response within one week, please send a follow-up email, as your initial email may have been accidentally overlooked in the inbox.

### 2.4 Textbook (optional)

Gravetter, F.J., Wallnau, L.B., (2020). Statistics for the Behavioral Sciences (10th Ed.). Boston, MA: Cengage Learning. ISBN-9781337280754. The textbook is highly recommended to aid with your learning for this course and contains multiple practice questions. Nonetheless, all required content will be covered during lectures. This is supposed to be the textbook that you have used for PSY201.

|                   |                |                      |                        |
|-------------------|----------------|----------------------|------------------------|
| Final Exam<br>35% | Midterm<br>25% | Final Project<br>20% | Quiz & Practice<br>20% |
|-------------------|----------------|----------------------|------------------------|

Figure 1: Evaluation Breakdown

## 3 Course Descriptions and Goals

### 3.1 Description

Introduction to statistics is an essential course for psychology students who seek to understand how to collect, analyze, and interpret data. In psychology, statistics is used to make sense of the vast amount of data collected through experiments and studies. This course provides students with a basic understanding of statistical methods commonly used in psychological research. Overall, this course covers basic statistical methods, such as t-tests and correlation analysis, as well as how to use statistical software like R or JASP to analyze data. This course is crucial for psychology students to develop their data analysis skills, which are essential for conducting research and interpreting the results of psychological studies.

### 3.2 Goals

#### 3.2.1 Goal 1: Knowledge Application

As a student taking this course, you can expect to gain a solid foundation in statistical analysis and learn how to apply these methods to psychological research. By the end of the course, you will be able to understand and conduct basic statistical analyses, interpret the results, and communicate them effectively.

#### 3.2.2 Goal 2: Data Analysis

Another primary goal of this course is to develop your analytical skills. You will learn to identify research questions, design experiments and studies, and choose appropriate statistical methods to analyze data. You will also learn to evaluate the validity and reliability of research findings, as well as the strengths and limitations of statistical methods.

#### 3.2.3 Goal 3: Scientific Communication

The third goal of this course is to develop your scientific and statistical communication skills. You will learn to effectively communicate your findings to others, both orally and in writing. You will learn to write clear and concise research reports, and to create compelling visualizations of data. Effective communication skills are essential for success in psychological research and are highly valued in many other fields as well.

#### 3.2.4 About this course

1. **A brief course description:** Fundamentals of statistical analysis of experimental and observational data including linear models, the analysis of variance, post-hoc tests, power analysis and effect size calculations.
2. **Prerequisite:** PSY201H1/ EEB225H1/ GGR270H1/ IRW220H1/ POL222H1/ SOC202H1/ STA220H1/ STA238H1/ STA248H1/ STA288H1/ PSY201H5/ STA215H5/ STA220H5/ PSYB07H3/ STAB22H3/ STAB23H3
3. **Exclusion:** ECO220Y1/ SOC252H1/ STA221H1/ PSY202H5/ STA221H5/ PSYC08H3/ STAB27H3/ STAC32H3
4. **Distribution Requirements:** Science
5. **Breadth Requirements:** The Physical and Mathematical Universes (5)
6. **Additional Information:** <https://artsci.calendar.utoronto.ca/course/psy202h1>
7. **Course Materials:** <https://q.utoronto.ca/courses/339073>

### 3.3 Checklist

By the end of this course, you should be able to:

1. Understand and apply basic statistical concepts, including probability, hypothesis testing, and measures of central tendency and variability.
2. Use appropriate statistical methods to analyze data, including within-ANOVA, between-ANOVA, mixed-ANOVA, Linear Regression, Non-parametric analysis
3. Critically evaluate psychological research studies and their statistical analyses.
4. Communicate research findings effectively through formal reports using APA format.
5. Use statistical software (e.g., R, JASP) to analyze data and create visualizations.

## 4 Recommended Readings

Gravetter, F. J., and Wallnau, L. B. (2017). *Statistics for the Behavioral Sciences* (10th Ed.). Boston, MA: Cengage Learning. ISBN: 978-1-337-36622-9

The textbook is highly recommended to aid with your learning for this course and contains multiple practice questions. Nonetheless, all required content will be covered during lectures.

## 5 Communication

### 5.1 Class and Tutorials

PSY202H1S is an in-person course, including a 2-hour class and 1-hour tutorial per week. This course is delivered through live, in-person lectures and virtual synchronous tutorials. It is mandatory for students to choose a tutorial and sign up at the beginning of the semester. Some lectures might be recorded, however, they should be used to supplement your learning experience. We will not likely to record tutorials as they are hands-on.

### 5.2 Additional Learning Materials

There will be some pre-recorded additional learning materials posted on Quercus through the semester. However, the CI will clarify whether or not these materials will be tested on the mid-term or the final exam.

### 5.3 Mid-term and Final Exam

The term test and final exam will be handwritten unless you have been granted an appropriate accessibility accommodation. The time and location will be announced before the testing days. The date and location of the final exam will be decided by the Faculty of Arts and Science. The data and location of the final exam will be released around the end of February, 2024.

### 5.4 Office Hours

Office hours will take place primarily through Zoom.

### 5.5 Announcement on Quercus

Important course updates will be sent out via the Announcements tool on Quercus. It is your responsibility to regularly check course announcements

### 5.6 Ongoing feedback

I've created a survey that students can fill out anonymously after each class to provide me with feedback on lectures. This gives you the opportunity to let me know if I am going through the material too quickly, if there is a particular concept you are really struggling with, if there is something that could be improved about the structure of each class, etc. The link to this survey is available on Quercus. I cannot promise that I will be able to touch on every concern expressed in the feedback surveys. I will be looking for common concerns being expressed by students.

## 6 Inquiry and Request

### 6.1 Content

The best place to ask questions about the assignments, course material, or research in general is during class. Every class will include time for questions, and everyone will benefit from hearing the answers! Further questions can be posted to Discussion Boards on Quercus.

### 6.2 Course Admin

Email the course email for administrative matters (e.g., missed deadlines, technical problems, remark requests). Please do not reach out to our personal emails, as the course email allows us to coordinate more effectively. Before you email, check if your question has been answered on this syllabus or discussion boards!

## 7 COVID-19 Contingency

If conducting in-person lectures, tutorials, or exams begin to pose an increased health risk due to the changing nature of the pandemic, some parts of the course may be moved to a virtual environment. It is up to all of us to do our part to ensure the safety of the UofT community by wearing masks where appropriate and following public health guidelines.

## 8 Evaluative Material (Max = 100 points)

### 8.1 After-Class Quiz (Max = 10 points, best 5 out of 8)

The quiz will be posted on Quercus on Mondays after class, and it is due each Friday.

### 8.2 In-Tutorial Practice (Max = 10 points, best 5 out of 8)

Your TA will provide a practice question during each tutorial, which you are expected to complete during the session. Your final work and participation will be graded by your TA.

### 8.3 Final Project (Max = 20 points)

No one can write perfectly. The goal of these assignments is to evaluate the ability for students to improve their writing while thinking critically about statistical results, beyond mere significance values. To this end, the evaluation of these assignments will be based on a student's ability to consider reviewer feedback and revise their work. The written assignment is divided into three phases. Each section of the paper will have an initial and revised component. This means that students who provide a comprehensive revision of their written assignment can receive 10/10 as the final grade, even if the writing is not considered "perfect", insofar that they have adequately demonstrated their ability to revise and improve. More information will come on the Assignment specific module on Quercus. Assignments will be submitted through Quercus, and checked using Ouriginal.

#### 8.3.1 Phase 1: Results only, Max = 8 points

Students will be asked to analyze data by using proper statistical tests and to report the results in an APA format.

#### 8.3.2 Phase 2: Revised results and discussion, Max = 12 points

Students will be asked to review the comments and suggestions made by the TAs and revise their results write-up.

#### 8.3.3 Final Project Submission Guideline

For ease of grading, accepted file types have been restricted to .PDF and Microsoft files (e.g., .DOCX). Standardizing the file format ensures that Ouriginal (see below) can proof your submissions and that there are no broken or unopenable files. The full suite of Microsoft products is free to you through UofT Libraries, please see the website to download: <https://onesearch.library.utoronto.ca/ic/microsoft-365-personal-workstations>

#### 8.3.4 APA Format

APA is the style of documentation of sources used by the American Psychological Association. This form of writing research papers is used mainly in the social sciences, like psychology, anthropology, sociology, as well as education and other fields. For more information, please check out APA resources at UofT libraries: <https://guides.library.utoronto.ca/c.php?g=250462&p=1670709>. OWL is also a good place to find examples: [https://owl.purdue.edu/owl/research\\_and\\_citation/apa\\_style/apa\\_formatting\\_and\\_style\\_guide/general\\_format.html](https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html)

### 8.4 Midterm (Max = 25 points), before reading week

This midterm test will happen before your reading week. The midterm is cumulative. The length is three hours. Work will be handwritten, unless accommodated through accessibility. Students must bring a calculator. Students are encouraged to bring one page of cheat sheet. The test will include: 1) multiple-choice questions (MCQs), 2) Short Answer questions (SAs), and 3) Calculation and Application questions (CAs). Practice questions might be shared before the midterm.

### 8.5 Final Exam (Max = 35 points)

Content will be comprehensive, with a focus on the latter half of the course. The format will be consistent with the midterm test.

## 8.6 Bonus Evaluative Assignments (Max = 5 points)

Throughout the course, bonus material may be assigned as they are deemed necessary at the discretion of the Course Instructor. These do not count towards the main 100 percent of your final grade and are, instead, additional boosters (i.e., your gained bonus evaluative points) to your final grade. The bonus evaluative assignments are not mandatory.

# 9 Grading Policies

## 9.1 Extensions

We all live busy lives and sometimes it is difficult to make deadlines even with fair notice. To aid you, all students get **two free, unquestioned 36-hour extensions** to be applied at any stage of the final projects or any other assignments. **Requests will be made via a dedicated Quercus submission.** This does not mean all due dates are automatically extended by 36 hours. The ability to request the extension expires after the deadline and late penalties will occur. For accessibility, illness, or any related reason, or if you require more than 36 hours, you need to provide the appropriate documentation for extension approval. Extensions do not apply to tests, exams, or quizzes.

## 9.2 Late Penalties

Submitting the written assignment late, without an approved extension, accrues a 10 percent penalty per day it is late. An assignment is deemed late the moment the clock strikes midnight (Toronto time) and accumulates late days every midnight following. Please do not wait until the last minute to complete and submit your assignment. Be cognizant of increased Quercus traffic near midnight, and possible internet connectivity issues. After three late days have past, the student will no longer be allowed to submit the assignment and it will receive a final grade of zero.

## 9.3 Missed Assessments

If a student misses a quiz or the midterm due to illness or any other valid reason, please reach out to the instructor as soon as possible. Please refer to 9.5 Specific Medical and Personal Circumstances for more information. Missed tests will be accommodated on a case-by-case basis and may involve make-up assessments, reweighing grades, or alternative assignments. Students have no more than one week to get in touch with the course instructor and provide documentation for missing assessments (e.g., tests or quizzes).

## 9.4 Re-Grade Requests

Your TAs and I work very hard to grade assignments fairly and thoughtfully. If you believe an assignment has received a grade in error, you may submit an appeal. Write a brief cover letter or email explaining your concern and email it to the course email and CC the course instructor. Please submit appeals 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, decrease, or stay the same.

## 9.5 Specific Medical and Personal Circumstances

If you become ill and it affects your ability to do your academic work, consult me right away. Please be reminded that the ACORN Absence Declaration (AD) has been updated and now you can only submit one AD per semester, in total. Normally, I will ask you for documentation in support of your specific medical circumstances. This documentation 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 information on Absence Declaration Tool for students, please see <https://www.artsci.utoronto.ca/absence>. If you get a concussion, break your hand, or suffer some other acute injury, you should register with Accessibility Services as soon as possible.

## 9.6 Religious and Cultural Accommodations

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty with a wide range of cultural and religious traditions. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (like a test or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient

notice (at least two to three weeks). In such circumstances, we will evaluate whether offering an extension, assigning a makeup assignment, or reweighting remaining assignments is the most appropriate path.

## 10 Academic Integrity

### 10.1 What is Academic Integrity?

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, collaborating with fellow students, and writing tests and exams. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism — representing someone else's work as your own or work that you have previously submitted for marks in another class or program — is a serious offence that can result in sanctions. Speak to me or your TA for advice on anything that you find unclear. To learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at <http://www.writing.utoronto.ca>. Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see <https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity> and <http://academicintegrity.utoronto.ca>. Plagiarism is not necessary the textual copying of another's work. Using someone else's idea as your own is also a form of plagiarism.

### 10.2 Additional readings about Academic Integrity

Definition of Academic Integrity: <https://www.academicintegrity.utoronto.ca/> and University of Toronto Code of Behaviour on Academic Matters: <https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic>

### 10.3 Can I use Artificial Intelligence (AI)?

The use of artificial intelligence (AI) content creation tools/systems (e.g., ChatGPT, Jasper, etc.) is permitted in this class on certain conditions: 1) You consult me first on your plan for using AI with the assignment. I may offer you an alternative approach, or suggestions on how to appropriately use AI for the assignment. 2) You state explicitly at the beginning of the assignment when, why, and how you have used AI. This includes the prompts you used to generate the results. You also need to specify what elements of the AI-generated text you have used. 3) If your AI output matches data/information, you are responsible for verifying accuracy and providing sources. Note that AI does not always provide accurate information or sources. 4) If I or your TA detect AI plagiarism in your assignment, you will be found in violation of the Code of Behaviour on Academic Matters and the consequences of academic misconduct will be in effect. Keep in mind that you are ultimately responsible for your work, and it is always better, from a skill building perspective, to complete all work without the use of generative AI. However, I do understand that learning to use these kinds of tools is important.

### 10.4 What is Ouriginal?

Normally, students will be required to submit their course essays to the University's plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support and Innovation web site (<https://uoft.me/pdt-faq>).

### 10.5 What is Plagiarism?

There are many forms of plagiarism. Many people assume plagiarism occurs when one directly copies another authors' work as their own. However, rewording another's work without proper credit is also a form of plagiarism. This is because you are essentially taking another person's ideas and making them your own. Self-plagiarism occurs when you reuse your own work without acknowledgement. Thus, all student submissions should be the student's own fresh and original work, not used in other courses. They should be the ideas of the student submitting them, and not from another student, person, or computer/AI generated idea.

### 10.6 How to ensure Academic Integrity?

Here are three easy ways to ensure you meet academic integrity 1). Turn in original work. Do not copy/paste from any external source (including websites, encyclopedias). Do not use work you have submitted in other classes. Do not reword another source without citing it as the original author's intellectual property. 2). Do not use data analyses software, spreadsheets, or any other unauthorized software. The only exception is using JASP or software of your choice to analyze

data for your written assignments. 3). All graded work, unless otherwise specified, should be completed independently. This includes assignments, quizzes, and assessments/tests/exams.

## 10.7 Repercussions for violating Academic Integrity

Academic misconduct may receive one or both of the following, and/or other consequences: 1) An assigned grade of zero to any graded material in the course. 2) Acceleration to the Department or other disciplinary action.

# 11 Support for Students

## 11.1 Accessibility Services

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic year by visiting <http://www.studentlife.utoronto.ca/as/new-registration>. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS.

## 11.2 Mental Health

As a student, you may experience challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation, financial concerns, family worries and so forth. These factors may affect your academic performance and/or reduce your ability to participate fully in daily activities. Everyone feels stressed now and then – it is a normal part of university life. Some days are better than others, and there is no wrong time to reach out. There are resources for every situation and every level of stress. There are many helpful resources available through your College Registrar or through Student Life (<http://studentlife.utoronto.ca> and <http://www.studentlife.utoronto.ca/feeling-distressed>). An important part of the University experience is learning how and when to ask for help. Please take the time to inform yourself of available resources.

## 11.3 Writing Support

Developing your writing ability is a critical skill to take advantage of during your undergraduate career. A strong writing ability is crucial to communicate ideas. I often recommend students to re-read their first university writing assignment and their final university writing assignment to gauge how much they improve. The university offers writing support centers, which I encourage students to take advantage of: <https://writing.utoronto.ca/writing-centres/>. English language support is also offered through the Writing Center (<https://writing.utoronto.ca/support/english-language-support/>) and the Center for International Experience (<https://www.studentlife.utoronto.ca/cie/els>).

## 11.4 Other Support

The Center for International Experience offers support for students, especially international students (<http://www.studentlife.utoronto.ca/cie>). The University provides support for students with children or who have family responsibilities (<https://familycare.utoronto.ca/>).

## 11.5 Office of Academic Success

The university has a support center for students to engage in learning strategies and develop a roadmap for undergraduate success (<http://www.studentlife.utoronto.ca/asc>).

## 11.6 External Help with Statistics

Khan academy is an external source that has numerous resources pertaining to statistics: <https://www.khanacademy.org/math/statistics-probability>. Crash Course is a good YouTube series which condenses numerous topics: [https://www.youtube.com/playlist?list=PL8dPuuaLjXtNM\\_Y-bUAhblSAdWRnmBUcr](https://www.youtube.com/playlist?list=PL8dPuuaLjXtNM_Y-bUAhblSAdWRnmBUcr). Note that what we cover in this course is a small window of the overall Statistics field. These external resources contain much more information than will be covered in the course and thus should not be used as study material. However, I encourage students to continue expanding their knowledge base during and after the course. Understanding statistics is one of the most important life skills to acquire.

## 11.7 Lecture Capture by Instructor

If lecture recordings are provided, they are only for the exclusive use of enrolled students, for their personal learning. Lecture recordings are not to be shared in any way beyond enrolled students.

## 11.8 Privacy/FIPPA Statement

Personal information is collected pursuant to section 2(14) of the University of Toronto Act, 1971 and at all times it will be protected in accordance with the Freedom of Information and Protection of Privacy Act. Please note that this course requires presentations of one's work to the group. For more information, please refer to <http://www.utoronto.ca/privacy>.

## 11.9 Course Materials, Including Lecture Notes

Course materials are provided for the exclusive use of enrolled students. Do not share them with others. I do not want to discover that a student has put any of my materials into the public domain, has sold my materials, or has given my materials to a person or company that is using them to earn money. The University will support me in asserting and pursuing my rights, and my copyrights, in such matters.

## 12 Beyond PSY202

Many students in this class have a keen interest in psychological research, whether clinical or basic, and are considering a career in this field. Preparing for a career in psychological research can be approached in various ways. The foundational step is gaining a solid understanding of statistics. Beyond that, UofT offers numerous research and laboratory opportunities for students.

### 12.1 Additional Courses offered by Department of Psychology

#### 12.1.1 PSY203H1 - Psychological Research

This course provides an introduction to conceiving, designing, and conducting research in psychology. It prepares students to be both consumers and producers of scientific research, and also addresses basic issues related to the work of psychological scientists such as theory development, research ethics, and scientific writing. Students in this course will gain insight into the scientific process as a whole – its advantages, difficulties, and limitations. As such, students will be able to better evaluate the knowledge that psychological science can provide, and integrate that knowledge into a broader worldview.

#### 12.1.2 PSY305H1: The Treatment of Psychological Data

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.

#### 12.1.3 PSY330H1 - Psychological Measurement

This course focuses on the development and evaluation of psychological measures, including the measurement of knowledge, abilities, attitudes, and personality traits. We will discuss theoretical and methodological issues in psychological measurement, covering important concepts such as reliability and validity and how these affect the interpretation of test scores and research findings. There will be some discussion of the application of psychological measures to various settings and the ethics of psychological assessment.

### 12.2 Research opportunities offered by Department of Psychology

#### 12.2.1 PSY299H1/Y1 - Research Opportunity Program

Credit course for supervised participation in faculty research project. Details at <https://www.artsci.utoronto.ca/current/academics/research-opportunities/research-opportunities-program>.

#### 12.2.2 PSY399H1/Y1 - Research Opportunity Program

Credit course for supervised participation in faculty research project. Details at <https://www.artsci.utoronto.ca/current/academics/research-opportunities/research-opportunities-program>.

### 12.2.3 PSY405H1/Y1 and PSY406H1/Y1 - Individual Projects

A single semester intensive laboratory or applied research project for students who seek hands-on research experience to complement our regular course offerings. Each project culminates in a scholarly paper and oral presentation. Students must secure a faculty supervisor from the Dept. of Psychology and submit a completed application form that includes details about the project before the start of the semester. Application forms are available on the Department's website (<https://psych.utoronto.ca/programs-and-courses/undergraduate-course-information>) and must be emailed to the undergraduate office ([psy.undergrad@utoronto.ca](mailto:psy.undergrad@utoronto.ca)) by the end of the first week of September for fall projects, the start of the second week in January for winter projects. If you're registering for a summer project, please submit it by the beginning of the first week in May. This course is open to all students.

## 13 Land Acknowledgement

I wish to acknowledge the land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island. We recognize a legacy of broken treaties and covenants and the need to strive to make right with all our relations. For a map of the treaties, territories, and languages represented on this land, you can visit: <https://native-land.ca/>

## 14 Course Materials and Intellectual Property

Please keep in mind that all course materials (lecture slides, lecture recordings, assignments, etc.) are intellectual property. They are not to be posted anywhere (including social media, such as student created course Facebook pages) or sold to a third party. We work hard to create course content for you and sharing our intellectual property without permission is theft. Please don't do it. Please note posting, sharing, or viewing shared evaluation materials (such as test questions) is a violation of academic integrity, and will be penalized harshly. Please familiarize yourself with academic integrity policies and consequences at <https://www.academicintegrity.utoronto.ca>.

## 15 Equity, Diversity and Inclusion Statement

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities. Click this link for more information: <https://people.utoronto.ca/inclusion/edi-at-u-of-t/>

## 16 Credits for Course Development

The content and materials of this course have integrated materials from PSY202 from past years. I appreciate the support and generosity of the previous course instructors, Dr. Bruce Schneider, Dr. Amanda Sharples, and Marco Sama. I also appreciate the course instructors who have shared their pedagogy and supported me in developing this course: Dr. Ali Hashemi, Mia Radovanovic, Grace Wang, Mahmoud Bitar, and Prateek Dhamija.

# PSY202: Statistics II Winter 2024 Course Calendar

## *First Half of the Semester*

In-Person Lectures: Mondays 6-8PM, FE114, Jan 2024 – April 2024

| Week | Date   | Topic                             | Comments  | Due    | Important Dates  |
|------|--------|-----------------------------------|---|--------|--|
| 1    | 08-Jan | Introduction & Review             | <b>Chapter 1 – 10 (review):</b> What are the two main ways to describe data that you have learned from PSY201 and this class so far? What is a T-test? What is hypothesis testing, and how do you conduct it? What are the mean, mode, median, variance, and standard deviation? What is correlation? |        | Classes in S courses begin   |
| 2    | 15-Jan | Review                            | There are no tutorials in Week 1.   | Quiz 1 | JAN 16 – Last day of S courses waitlist  |
| 3    | 22-Jan | ANOVA I<br>Between Subject Design | <b>Chapter 12:</b> What is the difference between a t-test and a one-way ANOVA? What distinguishes a between-subjects design in ANOVA? Why is it important to consider the between-subjects design?   | Quiz 2 | JAN 21 – Last day to enroll in S courses<br><br>JAN 22 – First day to Credit / No-Credit (CR/NCR) option for S courses |
| 4    | 29-Jan | ANOVA II<br>Within Subject Design | <b>Chapter 12:</b> Compare within-subjects and between-subjects designs. If you are planning to conduct a study, would you choose a within-subjects or a between-subjects design?   | Quiz 3 |  |
| 5    | 05-Feb | Midterm Review:<br>Simple ANOVA   |   | Quiz 4 |  |
| 6    | 12-Feb | Midterm                           | There are no tutorials in Week 6.   | NA     |  |

*Bonus lecture: Special Topic in Data Analysis using R (virtual, asynchronous)*

**Reading Week**

## PSY202: Statistics II Winter 2024 Course Calendar

### *Second Half of the Semester*

| Week                       | Date   | Topic                                     | Leading Questions  | Due                            | Important Dates   |
|----------------------------|--------|---|--|--------------------------------|---|
| 7                          | 28-Feb | Mixed ANOVA I                             | <b>Chapter 12:</b> Compare Mixed ANOVA to the ANOVA tests you learned before the mid-term. Debrief on the mid-term.  | Quiz 5 and Final Project Draft |   |
| 8                          | 04-Mar | Mixed ANOVA II and design                 | <b>Chapter 12:</b> An In-Depth Look at Design and Applications.  | Quiz 6                         |   |
| 9                          | 11-Mar | Regression I                              | <b>Chapter 15 &amp; 16:</b> What is regression   | Quiz 7                         |   |
| 10                         | 18-Mar | Regression II                             | <b>Chapter 15 &amp; 16:</b> Compare and contrast regression, correlation, and ANOVA (and t-test)   | Quiz 8                         | MAR 14 – LAST DAY TO DROP S COURSES   |
| 11                         | 25-Mar | Non-Parametric Tests                      | <b>Chapter 17 &amp; 18:</b> Why do we use non-parametric tests? Compare and contrast to ANOVA and regression   |                                |   |
| 12                         | 01-Apr | Data Treatment in Research & Review       | How do you plan to apply the tools learned in this class to your research? It's crucial to ensure that your research design aligns with your analysis tools. | Final Project                  |   |
| <b>April 10 - 30, 2024</b> |        | Final Exam<br>Date & Location: <i>TBA</i> |  |                                | April 8th: The last day to add or remove a CR/NCR option in S courses<br>April 8th: Deadline to request Late Withdrawal (LWD) from S course at College Registrar's Office |

