PSY201 H1S LEC0101, Statistics I: Course Syllabus

University of Toronto, Winter 2025

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People

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CI = course instructor; TA = teaching assistant

Instructor and TA contact

I will try to respond within two business days. Please try to limit content related questions to office hours or lecture breaks. I ask students to use their UofT emails, as they are more secure and are governed by the University's codes of conduct. When contacting me, please include "PSY201" somewhere in the subject line along with the topic of the email. TAs may have their own contact preferences, please discuss this with each TA.

Course delivery

PSY201H1S is delivered through live, in-person lectures with optional virtual tutorials. Lectures take place Tuesdays from 5:00 PM – 7:00 PM and Thursdays from 6:00 – 7:00 PM. Lecture recordings should be used to supplement your studying. We will likely not record tutorials as they are optional and involve hands-on work. Students are also recommended to use a scientific calculator to complete practice questions and quizzes. This is because exams (i.e., midterm and final exam) will be handwritten, requiring the use of a calculator to aid arithmetic completion. Office hours will take place primarily both virtually and in person, depending on student availability.

Course Description, Learning Outcome, and General Information

Prerequisite

Introductory to Psychology (PSY100H1, or PSY100Y5, or both PSYA01H3 and PSYA02H3, or COG250Y1). Recommended to have Grade 12 Calculus. A basic comprehension of psychology/neuroscience is recommended as these are where many examples are drawn from.

Course description

In this course, we will learn theory and application techniques for various statistical tests. A focus will be on interpreting data beyond the mere results, and providing a theoretical background to learn where these tests came from. No one just sat down and came up with these equations. They all derive from earlier sources and mathematical logic. Understanding this logic, rather than purely memorizing, is the key to a good comprehension this material.

Learning outcome

My goals for this course are threefold. First, for you to be able to comprehend research data. Statistics is the language of science and the most important tool at its disposal. As you will all be either future producers or consumers of science, a statistical background will be an invaluable aid to your daily life. Second, to help inoculate yourselves against the misuse of statistics. In 1907, Mark Twain popularized the quote *"There are lies, damned lies, and statistics"*, highlighting the prevalence of their misuse. Finally, I hope you have an appreciation of statistics and math. Even if you still do not like the topic, I hope you at least realize its importance.

How to approach this course

The best approach is to <u>understand, not memorize</u>, the course material. The emphasis is on comprehension, not memorizing formulae. Instead, focus on knowing how to apply appropriate tests to answer data-driven and theory-driven questions. Learning statistics is like learning to cook. It is not about memorizing ingredients, but knowing how to apply them, what to add, and how to modify them to fit unique situations. We start with basic "recipes" and build on them. This does not mean you are learning categorically different tests, but rather how tests change

to fit new parameters. Thus, it is imperative that you keep up with the material or you may quickly fall behind. If you miss a lecture, make sure you catch up before attending the next class. Please reach out if you find you are struggling. Due to the cumulative nature of this course, it can be easy to fall behind.

Materials

A note on accuracy of course material

I will ensure calculations and theory are accurate to the best of my ability. If you notice a mistake anywhere in the course, please point it out and I will be sure to correct it.

Textbook

Gravetter, F.J., Wallnau, L.B., (2020). Statistics for the Behavioral Sciences (10th Ed.). Boston, MA: Cengage Learning. ISBN-9781337280754. While not mandatory, it is as a great resource both in the course and as a future reference.

Course website

PSY201H1S uses the University's learning management system, Quercus, to post information about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as sharing important announcements and updates. The site is dynamic and new information and resources will be posted regularly as we move through the term, so please make it a habit to log in to the site on a regular, even daily, basis. To access the course website, go to the U of T Quercus log-in page at https://q.utoronto.ca. Once you have logged in to Quercus using your UTORid and password, you should see the link for PSY201. All content will be posted through this Quercus page. This includes video streams for lectures and tutorials.

Required software

For assignments, the use of Microsoft Word is a requirement, as part of the assignment is responding to feedback. You can access a browser version of Word by logging into your student email on Microsoft Outlook and launching Word from the app tab. Additionally, the University provides Office licenses to all students which can be accessed here: https://onesearch.library.utoronto.ca/ic-faq-categories/microsoft-365-proplus.

Content Schedule

The course schedule is outlined in the table below. Please note that topics are subject to change depending on the pace that content is covered during lecture.

Week	Date	Lecture: Topic	Readings**
1	Jan. 7 & 9	L1: Introduction, terminology, and descriptives	Ch 1, 2
2	Jan. 14 & 16	L2: Sampling from a population	Ch 2, 3, 4
3	Jan. 21 & 23	L3: Introduction to probability	Ch 6
4	Jan. 28 & 30	L4: Probability distributions	Ch 7
5	Feb. 4 & 6	L5: Hypothesis testing, *z* and *t*	Ch 5, 8, 9
6	Feb. 11 & 13	L6: Independent and paired sample *t* tests	Ch 10, 11
7	Feb. 25 & 27	*Midterm test and first OTB activity*	
8	Mar. 4 & 6	L7: Power for *t* tests, nonparametric equivalents	Ch 9, 10, 11
9	Mar. 11 & 13	L8: Correlation and regression	Ch 15, 16
10	Mar. 18 & 20	L9: Chi-squared tests	Ch 17, 18
11	Mar. 25 & 27*	L10: Introduction to ANOVA and multiple regression	Ch 12
12	Apr. 1 & 3	L11: Introduction to machine learning	

* Second OTB activity on March 27

** Readings are suggested, but not mandatory. There will be substantial overlap between textbook and lecture content, though all exams will be taken out of lecture content.

Attending lectures

Content from each new lecture builds on the preceding class. Due to this hierarchical structure, lectures should be viewed in the order they are delivered. Missing one lecture without properly reviewing the material will result in confusion for subsequent lectures. During lecture, you are invited to ask questions by raising your hand and waiting until I acknowledge you. Please be

respectful during lecture and tutorial. Do not interrupt without being acknowledged, do not converse with a neighbor, and avoid distractions (e.g., playing a game on your phone or computer) which may impact the focus of other students, and myself.

Attending tutorials

During tutorial, TAs will work through practice material and answer student questions. There are four virtual sessions. They are optional, but highly recommended. Tutorials are imperative to gaining a practical understanding of the course material. Lecture is not enough, *you need to practice the material*. Just like learning to bake a cake begets *baking the cake*.

Attending the term test and final exam

Information will be made available on Quercus. Please follow instructions closely to ensure a smooth and efficient experience. You are required to bring your University of Toronto Student ID. The term test and final exam will be handwritten unless you have been granted an appropriate accessibility accommodation. You will be given a formula sheet so you don't have to focus on memorization of formulae, but instead learn to understand them. Make sure to bring a calculator. No other material is permitted.

Attending outside the box (OTB) activities

Outside the box activities will take place on February 27 and March 27, in class. They are mandatory to attend. Thus, valid documentation is required if you were to miss one and require a makeup.

Evaluative Material

Evaluations are designed as a skills-based assessment of your comprehension of course material through written, computational, and analytical means at various skill levels.

Assessment	Quantity	Weight	Due
Post-lecture quizzes	10	8% (1% × top 8)	Prior to each subsequent class
Workbook problem set	1	10%	Feb. 14
Written assignment	3	10%	Feb. 7; Mar. 14; Apr. 3
Outside-the-box activity*,**	2	7% (3.5% x 2)	Feb. 27; Mar. 27
Midterm Term test**	1	30%	Feb. 25 (TBD)
Final exam**	1	35%	TBD

* These activities are technically worth 8%, but only 7% goes towards the final grade and 1% are allocated as bonus marks.
** Synchronous, in-person evaluation, requiring University of Toronto student ID.

Completing evaluative material

Students are required to complete all graded assessments (those listed in the above table) *INDIVIDUALLY* or with assigned partners (OTB and assignments). It is considered an academic offense for students to work together to complete these. An academic offense includes, but is not limited to, discussing answers to questions, discussing ways to complete questions, sharing answers, completing another student's work, or having another student complete your work, or using generative AI content. All non-graded assessments (e.g., practice questions) can be discussed with your peers. You are also prohibited from using any statistical analysis, spreadsheet software, or generative AI when completing graded material.

Post lecture quizzes: 8%

Despite being allocated the smallest percentage, these quizzes are probably the most important evaluations. These quizzes exist as a self-reflection on your understanding of the course material. This is to ensure that, if you fall behind in one lecture, you do not fall behind in subsequent lectures. For example, to understand *t* tests you need to understand *z* tests, which requires you to understand hypothesis testing. The more you fall behind or do not keep up with course material, the exponentially greater your confusion will be. These quizzes catch areas of confusion, allowing you to seek help and prevent yourself from falling behind. Quizzes will ask

questions from their assigned lecture, and will involve either a quick calculation or short answer. Students should prepare by following along in lecture and tutorial, asking questions when necessary, and practicing calculations. It is understandable that students will miss certain classes, or may struggle with the occasional lecture material, so we will only include the top 8 quizzes out of the 10 given. Make sure to take advantage of the opportunity to improve your comprehension if you realize you are struggling with a lecture topic!

Each quiz is worth 1% of your final grade and only the top 8 of 10 will count. Again, while this is a minor contribution to your final mark, these quizzes are invaluable in ensuring you are keeping up with the material. Therefore, it is imperative that students complete these short self-evaluations. They will be posted after each tutorial and should take roughly 10-15 minutes to complete. These quizzes are before the subsequent lecture. Please do not wait until the last minute to complete quizzes in case you have technical difficulties. Late submissions will not be allowed. Since students may be adding or dropping the course in the first week, a quiz will not be given after the first lecture.

Workbook problem set: 10%

This will be a large homework assignment that mimics a take-home term test and can be used to assess your comprehension of the material. This assessment will involve calculations and short answer and may involve uploading handwritten work. This exists to help you gauge your preparedness for the midterm tests and other upcoming evaluations. It is *imperative* that you do this assessment as you would any term-test, despite its take-home nature. This is to ensure you have an unbiased perspective on how you are performing in the course prior to the in-person assessments.

Written Assignments: 10%

Since no students' writing is perfect, 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. Phase I (due February 7): submit an interpretation of data; Phase II (due March 14): revise the interpretation based on feedback and submit a future direction with experimental design; and Phase III (due April 3): submit a revised future direction with experimental design based on feedback. Note that these assignments must be completed in pairs, with partner signups due January 31.

Outside the box activities (OTBQ): 8%, 7% towards the final course grade, 1% bonus

A more challenging activity, designed to enhance "outside the box thinking" will occur near the midterm test and final exam. Unlike the post-lecture quizzes, these will not be simple evaluations that ensure you a surface-level comprehension of the material. As their name suggests, they will focus on a higher-conceptual understanding. They will evaluate your ability to think beyond a narrow focus and apply the material to novel situations you may not have seen in lecture or tutorial. This reflects how, in real research, we are often met with data that lack a clear complementary analysis. We want to enhance a flexible thinking strategy towards data analysis and learn how to play with the inner workings of these tests to fit such diverse situations. Given this, these quizzes have a unique weighting. Although each activity is worth 4%, only 3.5% goes towards your final grade and 0.5% is bonus. Therefore, a 50% on the activity is technically 1.75/4. Getting an 87.5% (3.5/4) on the activity grants you the full 3.5% towards your final grade. Anything above 87.5% on the activity counts as a bonus towards your final grade. These will take place in class time (February 27 and March 27) and can be done in pairs.

Term test: 30%

This serves as the midterm test. The length is three hours. Work will be handwritten, unless accommodated through accessibility. Students must bring a calculator. There will be a variety of short answer, short calculation, and one long calculation question.

Final exam: 35%

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

Extensions, late penalties, and missed assessments

We all live busy lives and sometimes it is difficult to make deadlines even with fair notice. To aid you, all students get up to six free late days that can be used up at a self-assigned pace. You do not need to request these extensions. Merely submit your assignment a certain number of days late and include a comment on the submission that you are using up those number of late days. For example, the deadline for Phase I is February 7. If you submit on February 9, you have used up two of your six days and can have up to four late days to be used on additional submissions. If you submit Phase I on February 13, this uses all six late days and you have no free extensions on future submissions. These free extensions are not to be used for health-related or accessibility-related reasons, or other emergencies. Please reach out to me for these situations.

Submitting graded material late, without an approved extension, accrues a 10% penalty per day it is late. An assignment is deemed late the moment the clock strikes midnight 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.

If a student the out-of-box activity or the midterm due to illness or any other valid reason, please reach out to the instructor as soon as possible. Students have one week from missing

the date of the test or quiz to inform the instructor and submit an Absence Declaration on ACORN or provide other documentation, such as a VOI or other as listed below under "Specific Medical Circumstances". Missed tests will be accommodated on a case-by-case basis and may involve make-up assessments, reweighing grades, or alternative assignments. Due to the number of quizzes and that only 8 of 10 count, there are no extensions or makeups for post-lecture quizzes.

Specific medical circumstances

If you become ill and it affects your ability to do your academic work, consult me right away. 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. If you cannot submit a VOI due to limits on terms of use, 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 (including dates, academic impact, practitioner's signature, phone and registration number). For more information on the VOI, please see http://www.illnessverification.utoronto.ca. 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 some other acute injury, you should register with Accessibility Services as soon as possible.

Requests for regrading

Students should expect fair evaluation and feedback from the instructor and TAs. Students are more than welcome to request a regrade if they believe their assigned grade is incorrect or does not accurately reflect the submitted work insofar that they provide valid reasoning (i.e., a student cannot simply say "I feel I deserve a higher mark", but must justify where they believe they were unfairly penalized). I, the Course Instructor, will do the regrade, and there is no guarantee the grade will increase, it is possible that the grade may decrease. This new grade becomes the assigned grade. Requests must come in within two weeks of the posted grade.

Bonus marks

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% of your final grade and are, instead, additional boosters to your final grade. Note that some bonus marks are already allocated to the Outside-the-box quizzes.

Quercus grades

No grades are considered official, including any posted in Quercus at any point in the term, until they have been formally approved and posted on ACORN at the end of the course. Please contact me as soon as possible if you think there is an error in any grade posted on Quercus.

Academic Integrity

About 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.

Use of Turnitin

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 & Innovation web site (https://uoft.me/pdt-faq).

Important links

Definition of Academic Integrity: https://www.academicintegrity.utoronto.ca/

University of Toronto Code of Behaviour on Academic Matters: https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019

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. This includes generative AI.
3. All graded work, unless otherwise specified, should be completed independently. This includes assignments, quizzes, and assessments/tests/exams.

What counts as 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.

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

Use of generative AI

Students may use artificial intelligence tools (e.g., ChatGPT) for creating an outline for an assignment, but the final submitted assignment must be original work produced by the individual student alone. Students may not use artificial intelligence tools for taking tests, writing research papers, creating computer code, or completing major course assignments. However, these tools may be useful when gathering information from across sources and assimilating it for understanding. Students may not use artificial intelligence tools for taking tests in this course.

Support for Students

Departmental guidance for undergraduate students in psychology

The Department of Psychology recognizes that, as a student, you may experience disruptions to your learning that are out of your control, and that there may be circumstances when you need extra support. Accordingly, the department has provided a helpful guide to clarify your and your instructor's responsibilities when navigating these situations. This guide consolidates Arts & Science Policies for undergraduate students in one place for your convenience. As an instructor in the department, I will frequently consult with these recommendations when

providing you with support, and I recommend that you also consult it to learn more about your rights and responsibilities before reaching out to me.

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.

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.

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).

Other support

The Center for International Experience offers support for 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/).

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).

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 an amazing YouTube series which condenses numerous topics. They have a great one on statistics: 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 knowledgebase during and after the course. Understanding statistics is one of the most important life skills to acquire.

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.

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.

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.

Land acknowledgement

I wish to acknowledge this 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 and we are grateful to have the opportunity to work on this land.