

PSYC 218-011 Analysis of Behavioural Data

Session: 2025/26 Winter, Term 2

Date Range: 2026-Jan-09 to 2026-Apr-10

Time: Fridays, 11:00 am to 2:00 pm

Place: P.A. Woodward Instructional Resources Centre (IRC), Floor G, Room 4

Your Instructional Team

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PSYC 218 Course Description

This course is an introduction to the statistical analysis of data. In this course you will learn to *describe* and visualize data in an informative way, and how to make *inferences* by applying

statistical tests to data. Although the examples given in this course will emphasize psychology, the skills that you learn in this class are broadly applicable to data in any domain.

This course is an introduction to statistics. This is an early stage in learning the foundational skills in a wonderful world of exploration, and not the final step to complete mastery.

The ideas in the course may not immediately seem relevant to understanding behaviour. As is the case with many skills (e.g., learning to play notes before songs, learning steps before dance routines), you must learn the component skills before you can put them all together in a way that you can apply. It takes time to pay off, but it is ultimately worth the effort.

For many people, this course will be a challenge. (Challenges are rewarding!) Keep up with the class, because keeping up is much easier and more effective than trying to catch up. Prepare to put in work and to spend time practising. Again, as is the case with many skills, you need to learn the component skills to fluency in order to be able to learn to put them all together. And this takes regular practice!

Practice necessarily involves making mistakes. When you begin learning a new skill, you do not know the skill, and will make mistakes. With practice you get better. Then, in just a few hours or days, you forget some of what you learned. Then, with more practice, you get even better than before. Again, in just a few hours or days, you forget some of what you learned. Again, with more practice, you get even better yet. And so on. Imperfection is part of practice. Persist!

Seek help when you need it. Support one another's practice and learning (always within the bounds of academic integrity). We are a team.

Learning Goals

After this course you should be able to:

- Compare, contrast, and critique *descriptive statistics* and *inferential statistics*.
- Distinguish between a population and a sample, and between a parameter and a variable.
- Distinguish different ways of measuring variables.
- Be able to compute different metrics of central tendency and variability.
- Understand the construction of graphs like frequency distributions, binomial distributions, and sampling distributions.
- Recognize graphs, and be able to calculate linear relationships between two variables, and use those linear relationships to predict values on either variable.
- Understand principles of probability, and how to calculate probabilities.
- Understand what a normal distribution is, and how to use it to calculate probabilities.
- Explain and execute the process of Null Hypothesis Significance Testing (NHST).
- Choose and apply the appropriate statistic to analyze a dataset, when provided with a study's design and a researcher's purpose.
- Formulate appropriate null and alternative hypotheses, and use inferential statistics to test them.

- Explain the meaning of “statistical significance” (and why it is more limited than one might expect).
- Calculate, by hand and using computer software, a variety of statistics commonly used in psychology (e.g., correlation, regression, z-scores, t-tests, ANOVA).
- Interpret what these statistics mean about the variables and the hypothesis. And, evaluate others’ interpretations.
- Define and discuss the relationships among major statistical concepts (e.g., sample size, alpha, p-value, effect size, power).

Fitting this Course in Your Degree

This course is a requirement for the BA Psychology major, and is a prerequisite for Honours in Psychology, as well as advanced statistics classes in our department (e.g., PSYC 303 and PSYC 359).

Pre/Co-Requisites: This course requires that you have already successfully completed PSYC 217 Research Methods and declared a major in Psychology, Cognitive Systems, or Speech Sciences.

Withdrawals: Sometimes situations arise in which it is wise to withdraw from a course. If you are considering withdrawing from this course, I encourage you to talk to me. Check these [dates](#) to find out whether withdrawing will affect your transcript.

Course Materials

Buy the textbook and SPSS guide through the UBC bookstore. Save your proof of purchase. If you purchase elsewhere, you will not have integrated access to the required online resources (through *Achieve*), including required quizzes/assignments.

(1) Textbook: Nolan, S. A., & Goedert, K. M. (2024). *Statistics for the behavioral sciences*, (6th Ed.). New York, NY: Worth.

- You must purchase this textbook through the UBC bookstore. This is necessary because you must get the textbook bundled with *Achieve* (an online resource offered by the publisher), with integration with the UBC system.
- Other sections of this course may use a different textbook. A different textbook will NOT work in this section. You must use this textbook.
- At the UBC bookstore you may have the option of getting this textbook as an e-book, or bound, or loose-leaf. Feel free to get the option that works best for your learning style and budget (provided that it is bundled with *Achieve*).
- You will need it on Week 1.

(2) SPSS Guide: Cuttler, C. (2020). *A student guide to SPSS*, (3rd Ed.). NJ: Kendall Hunt.

- Purchase through the UBC bookstore. Do not buy a used access code.

- You may have the option of getting this guide as a digital or print option. Feel free to get the option that works best for your learning style and budget.
- This guide is necessary for completing the course assignments.
- You will need it by Week 4.

(3) SPSS (IBM Statistics Software):

- Get it, for free, from <https://ubc.onthehub.com>
- After clicking the link, follow the instructions for students.
- Download and install it early, to allow time to address challenges.

(4) The UBC Canvas Course Website:

- As a student registered for a UBC course, you have free access to Canvas, at canvas.ubc.ca
- Canvas will host course resources such as lecture slides, assignments, course announcements, and grades.
- Lecture slides will be posted here.

(5) iClicker Cloud:

- Available for free on the link *within* the Canvas course to set up an account (if you do not already have one), and link to your section of this course. Please use the same first and last name as appears on Canvas.
- UBC iClicker Guide: <https://lthub.ubc.ca/guides/iclicker-cloud-student-guide/>
- The iClicker Cloud will enable you to participate in class, and to have your participation recorded. You can use it on a laptop, tablet, or cellphone, provided that the device has an internet connection.

You will also need

(6) A Computer:

- This is the computer on which you will install and run SPSS.
- It will need sufficient hard drive space and computing capability to install and run SPSS.
- Most modern desktops and laptops should be able to handle it. Chromebooks and tablets will encounter difficulties.

(7) A Scientific Calculator:

- You will need a basic scientific calculator with inverse and square root functions. It should only cost about \$15.

Financial hardship? Contact me.

Learning Assessments

Summary of Learning Assessments

Assessment	Date	Percentage of Grade
Complete Survey	Jan 23	Lose 1% if not completed
Participation	Throughout term	2%
Research Experience Component (REC/HSP)	By last day of classes (or 10 days prior for the library option). Best done early!	3%
Achieve LearningCurve Quizzes	14 short adaptive quizzes throughout, as assigned in <i>Achieve</i>	5%
Assignments	Jan 31 Feb 14 Mar 7 Mar 14 Apr 11	20% (5 x 4%)
Midterm exams	Jan 30 Feb 27 Mar 27	36% (3 x 12%)
Final exam	TBD	34%
Total		100%

Descriptions of Learning Assessments

Participation

During the lectures there will be opportunities to practice, and to actively test your learning through iClicker.

This has several purposes. One purpose is to facilitate your learning by encouraging you to actively engage with the material (rather than passively be exposed to it). Another purpose is to give you immediate feedback, to help you identify what concepts you understand well, and what concepts you have misunderstood. A third purpose is to help me to identify what concepts you understand well, and what concepts require further explanation, and to identify what teaching approaches work best for each concept.

The deeper value of this participation is not the grade itself, but how it will improve your learning, the learning of your fellow students, and the ability of the teaching team to help you to learn.

Participation will be graded as follows:

If you respond to the majority of questions in...	You will receive...
80-100% of all classes with iClicker questions	2%
60-79% of all classes with iClicker questions	1%
0-59% of all classes with iClicker questions	0%

Research Experience Component (REC)

REC is required. These are not bonus points.

The purpose of the REC is to help you learn about psychology and psychological research, through hands-on experience. This may help you gain an understanding of how the concepts you learn work in practice, and help you discover whether you would enjoy a career in psychological research.

You have two options for fulfilling REC. You may choose to do all of one option or the other, or a combination of each, i.e., 2% of one and 1% of the other.

First Option – Human Subject Pool (HSP)

Most students will choose to earn their research experience component by spending three hours participating in psychology studies (worth 1% point for each hour) through the Department of Psychology's Human Subject Pool (HSP) system.

You can learn more about HSP at: <https://psych.ubc.ca/undergraduate/opportunities/human-subject-pool/>. Follow the link to create an account, locate studies, and sign up for them.

Inquiries about credits should be directed to HSP or to the experimenters, and NOT to the instructor of this course. Credits can be recorded and tracked via the subject credit website. These credits are added to your grade at the end of the course. If you do not correctly assign your credits to this course you will NOT receive credit, so please make sure that you have done this correctly.

Second Option – Library Writing Project

As an alternative to participation in psychology subject pool experiments, you may complete a library writing project. Such projects consist of reading a research article, from the dates 2000 to the present, from the peer reviewed journal *Psychological Science*, and summarizing 1) the research question, 2) the methods and 3) the results in written form.

You will receive one research participation credit for each article summary that meets the following requirements. Therefore, to earn the full three percent, you would need to write three summaries.

The article must be a research article; it cannot be a review article, a news item, a notice, or a letter to the editor.

The summary should be approximately 500 words in length.

Any student who is suspected of plagiarism will, at a minimum, not be granted credit, and their course instructor will be notified. Further action may be taken at a departmental or university level.

See the full instructions from the HSP team here: <https://psych.ubc.ca/wp-content/uploads/sites/2/2024/08/Info-for-Participants-2024-2025-W1.pdf>, in the section titled “The Library Option.”

Achieve LearningCurve Quizzes

These are multiple-choice style quizzes that I will assign in the *Achieve* online system. Each quiz is associated with a chapter of the textbook (Chapters 1-12, 15, 16). Each quiz will take approximately 30 minutes, but that might be shorter or longer depending on your needs, and on the subject matter of the particular quiz. As long as you finish by the deadline, you may take as much time as you need. You may take a break and save your progress. You may consult the textbook (i.e., the quizzes are open-book). The system is set up to let you do the quiz up to five times for practice, and each time will be different. You only need to complete it once for the credit.

When the lectures finish covering a chapter, the LearningCurve for that chapter has a target submission date of the Friday of the next week (there may be exceptions for holidays and other breaks). You have the option of a one-week extension, without asking me for it (the system is set up to grant it automatically), for each and every quiz.

The purpose of allowing this automatic one-week extension is to encourage you to keep up with the class, by giving you the target date that you should normally meet, but to also give you flexibility on weeks when you have other commitments on your time.

To access the quizzes, follow the link from our Canvas course. When you sign in the first time, the system will give you the option to be anonymous. Use this anonymous option only if absolutely necessary – it makes it more difficult to assign your marks to you.

The LearningCurve quizzes are graded on completion. Your overall grade for this component is calculated from the percentage of quizzes that you completed.

Assignments

The purpose of these assignments is to give you experience in analyzing and interpreting data using the statistical software SPSS, and in reporting the results.

Prior to each assignment, I will post an instructional video that demonstrates how to perform the necessary tasks in SPSS.

All assignments will be posted on Canvas. When you have completed an assignment, you will submit it on Canvas.

We will begin the assignments together, in class.

For each assignment, you will be randomly assigned into groups of three “assignment buddies.” They will be different for each assignment.

You are encouraged to help your assignment buddies by:

- Explaining the question or task to one another
- Showing one another how to use SPSS
- Asking one another about symbols and formatting, e.g., when to use italics

You must not give one another the full sheet of your answers. This will hurt the recipient in the long run, because the assignments help to prepare you for the exams, and for doing statistics in life.

Submitting the output of Generative Artificial Intelligence (e.g., ChatGPT) will result in a score of zero.

The assignments will be due at 11:00 pm the day after class.

You will have two 1-Day-Late passes. You can use them all at once, i.e., two days for one assignment, or separately, i.e., one day each for two different assignments. You do not need to ask for them – I will apply them as needed. (The Canvas system will automatically label it as “late,” but that does not mean that I will assign a penalty.) After those two days have been used, standard 10% per day deductions will apply (except in emergency circumstances with submission of [self-declaration form](#) or [in-term concession](#) from Arts Advising). Once grades for the rest of the class have been released, late assignments will not be accepted (the assignment must get zero).

Complete the Survey

The data for assignment 1 will be generated by you, the students in the class, by responding to a survey that I will send to the class. This should not take more than half an hour. If you do not complete the survey by the deadline, you will lose 1% from the final course grade.

Link to Survey: https://ubc.ca1.qualtrics.com/jfe/form/SV_bJ96wgELwKmHajc

Midterm Exams

Each of the three midterm exams will be held in class, on paper. They will have both multiple choice and short answer questions. These will include computation questions. You must answer the questions independently. You will hand-write your answers for the short answer questions. You will fill out a Scantron/Remark bubble sheet for the multiple choice questions.

Bring a basic scientific calculator, pencils, and erasers.

You will be provided with an unlabeled formula sheet that lists the formulae, but without the left side of the equation (e.g., missing $z =$), so that you will need to recognize what each equation does.

A purpose of this is to encourage you to learn to understand the logic of the formulae, by practicing recognizing what each formula is doing.

The second and third midterm exams are slightly cumulative, i.e., roughly 90% new material and 10% material from the earlier midterm exams. The new material will build on the foundation of the old material, so in that sense the knowledge being tested is all cumulative.

Final Exam

The final exam will be scheduled by the Registrar during the exam period.

The final exam will be cumulative. It will be held in person, on paper, with a mix of multiple choice and short answer questions, including computations. It will be longer than the midterm exams.

Bring a basic scientific calculator, pencils, and erasers.

Similarly to the midterm exams, you will be provided with an unlabeled formula sheet that lists the formulae that we have used but without the left side of the equation (e.g., missing $z =$).

You are required to write the final exam at the scheduled time. An exception is that if you have three or more final exams scheduled to start and finish within a 24-hour period, you may request to write the second exam on a different day. Please make this request to me at least one month before the exam.

If you absolutely must miss the final exam due to an extenuating circumstance like severe illness, you or your caregiver must apply for Academic Concession by contacting your Faculty's Advising Office.

UBC Psychology Departmental Grading Policy

In the Psychology Department, we aim to offer learning experiences that welcome and challenge all students to engage meaningfully in our discipline. We strive for grades that accurately reflect student learning and achievement of course learning objectives, rather than solely reflecting their performance relative to others.

In Psychology at UBC-V, we employ department-wide grading standards to promote equitable alignment, supporting students and course instructors as they learn and teach across many diverse courses and sections. For each Course Section, instructors should aim for a grade average in the following Target Ranges (before any bonus HSP points are added, but including any mandatory HSP points): **B- (68-71%) in Introductory 100-level and 200-level courses; B (72-75%) in Intermediate 300-level courses; B+ (76-79%) for Advanced 400-level courses and Selective-Entry lower-level courses** (e.g., PSYC 277, 278, 312, 370, 371, 349, 359, 365). Ranges are intended to provide some flexibility to instructors and account for differences that can occur

between classes. Ranges increase across year levels to account for improvements in student learning, and students' ability to self-select into more specialized courses.

During the course, instructors may choose to adjust grades and/or difficulty of the assessments, to align with the Target Range. At the end of the course, if the average falls outside the Target Range (either direction), instructors will typically be expected to use a linear transformation to adjust final grades (i.e., add or subtract the same number of points to all students' marks, while ensuring no student fails the course due to this transformation). If a course mean falls in within one +/- letter grade band above the Target Range (e.g., in the B+ range for Intermediate courses), and the instructor believes these grades to be justified, the instructor may submit a justification request using the departmental approval final grades submission form, and the grades may stand. This Upper Range is intended to inspire further excellence in learning and teaching, and allow for the possibility that some classes select for higher performing students. Courses with means exceeding the Upper Range will be expected to provide justification as well as use a linear transformation to fall within the Upper Range.

Grades are not official until they appear on students' academic record. Students will receive both a percent and a letter grade for this course. At UBC, they convert according to the key below:

A+	90-100%	B+	76-79%	C+	64-67%	D	50-54%
A	85-89%	B	72-75%	C	60-63%	F	0-49%
A-	80-84%	B-	68-71%	C-	55-59%		

Course Policies

Availability of Lectures and Slides: Lectures will be recorded so that they can be posted on Canvas. Sometimes a portion of the class will be devoted to practice questions, or other activities in which the main focus would be on students engaging in the activity. These portions of class time will not be recorded. Slides will be posted after lecture. Do not distribute recordings of lectures, or the slides, or the assignments, to any person or organization outside of this class.

Intellectual Inquiry and Respectful Discussion: University courses should facilitate learning and rigorous intellectual inquiry. This must be in a context in which everyone is treated with dignity and respect, and has equal opportunity to engage, hear, and be heard – regardless of race, ethnicity, gender identity, sexual orientation, political orientation, religious affiliation, ability, age, social status, etc. When discussing course material, it is important that you do so in a manner that is

fitting to respectful academic inquiry, and that is consistent with every other member of this class being able to, and welcomed to, engage in the material and express themselves in the same manner.

Academic Integrity: Academic integrity is vital to the mission of universities, and to creating an environment in which students can genuinely learn and grow.

You may, and are encouraged to, study with other students and to help one another learn. You may make and share study notes with other students, for the purpose of better learning the material.

As a scholar, you must build on the work of others, and when you use someone else's ideas as a legitimate component of your work, you must communicate them in your words, and you must cite them as your source.

You absolutely must not claim that something is your work when it is not. Do not submit work that you did not create. Do not submit another student's work. Do not collude with other students on assignments or exams. Do not submit the work of Generative AI (e.g., Chat GPT). Do not falsify data. Do not plagiarize. Do not use another person's ideas without citing them as your source.

See more here: <http://learningcommons.ubc.ca/resource-guides/avoiding-plagiarism/>

Do not share the materials from this course to outside persons or organizations (including computer systems). Do not post on file-sharing websites. Do not copy and paste sentences from the textbook into for profit software for use in studying (e.g., ChatGPT). The Teaching Team works hard to make and maintain these materials, and their value can be degraded or destroyed if they are shared outside of the classroom, or used for purposes that undermine the integrity of the course. The course materials are the intellectual property of the Teaching Team and the textbook authors.

The Use of AI: You may use AI to help you to understand aspects of the material or aspects of an assignment. You should keep in mind that AI often gives incorrect answers, so you should always make sure that you ultimately understand the concept yourself, rather than relying on the AI to be correct for you. If you use AI to help you understand an aspect of an assignment, you should ask a question, in your own words, that addresses the difficulty that you are having with the precise concept or step that you are struggling with. You may NOT enter an entire assignment question into AI, nor the numbers used by a question, nor use AI to tell you the answer to the question. Doing this would be cheating. It would also be violating the intellectual property of this course, by sharing it with a third party. If you use AI in this way, you will receive a score of 0 for the assignment. Doing so would also be cheating yourself, by denying yourself a learning opportunity that would prepare you for higher value assessments later in the course (i.e., exams).

Acknowledgements

The slides and other course materials for this course were influenced by the courses of Drs Catherine Rawn and Grace Truong. The course design and syllabus were influenced by their syllabi, and additionally by the syllabus of Dr Kristin Laurin. I am grateful for the support and inspiration.

Course Schedule

This schedule is subject to change. Any changes will be announced on Canvas.

Week	Date of Classes	In-Class Topic or Activity	Textbook Reading	Take-Home Work Due
1	Fri, Jan 9	Orientation Math refresher Introduction to statistics, variables Frequency distributions	Appendix A Ch. 1 Ch. 2	
2	Fri, Jan 16	Frequency distributions (cont.) Visual displays of data Central tendency and variability	(Ch. 2 cont.) Ch. 3 Ch. 4	Ch. 1 LearningCurve (Install SPSS)
3	Fri, Jan 23	Central tendency and variability (cont.) Sampling and probability	(Ch. 4 cont.) Ch. 5	Ch. 2 LearningCurve Ch. 3 LearningCurve Complete the Survey (Install SPSS)
4	Fri, Jan 30	Midterm 1 (Chs. 1-5) Normal curve, standardization, z scores <i>Assignment 1 (due next day)</i>	Ch. 6	Ch. 4 LearningCurve Ch. 5 LearningCurve
5	Fri, Feb 6	Normal curve, standardization, z scores (cont.) Hypothesis testing with z tests	(Ch. 6 cont.) Ch. 7	
6	Fri, Feb 13	Confidence intervals, effect size, and statistical power <i>Assignment 2 (due next day)</i>	Ch. 8	Ch. 6 LearningCurve Ch. 7 LearningCurve
Feb 16 to 20		Reading Week. No Class.		
8	Fri, Feb 27	Midterm 2 (Chs. 6-8) Single sample t tests	Ch. 9	Ch. 8 LearningCurve
9	Fri, Mar 6	Paired sample t tests <i>Assignment 3 (due next day)</i>	Ch. 10	Ch. 9 LearningCurve
10	Fri, Mar 13	Independent samples t test <i>Assignment 4 (due next day)</i>	Ch. 11	Ch. 10 LearningCurve
11	Fri, Mar 20	One-way between groups ANOVA Review	Ch. 12	Ch. 11 LearningCurve
12	Fri, Mar 27	Midterm 3 (Chs. 9-12) Correlation	Ch. 15	Ch. 12 LearningCurve
Fri, Apr 3		Good Friday. No Class		
13	Fri, Apr 10	Regression <i>Assignment 5 (due next day)</i>	Ch. 16	Ch. 15 LearningCurve <i>Last day of class</i>
	NO CLASS			Ch 16 LearningCurve (due Fri, Apr 17)
The date of the final exam has not yet been set. Do not book appointments or travel from April 14 to April 25, including Saturdays and Sundays.				