

## COURSE OUTLINE

### PSYCHOLOGY 277 (001): Behavioural and Neuroscientific Research Methods Term 1, 2022W

**Instructor:** Dr. Ipek Oruc

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**Pre-requisites:** Second-year standing in a Behavioural Neuroscience or Neuroscience specialization.

**Co-requisites:** NONE

**Textbook:** Methods in Behavioural Research, 3rd Canadian edition (2020) by Cozby, Mar and Rawn (previous editions are not suitable).

**Supplemental sources:** These are some additional resources to support you if you would like to deepen your understanding and broaden your knowledge beyond the level required to pass this course: Introduction to Statistical Reasoning (2010) by Gary Smith; Understanding Statistics in the Behavioural Sciences (2009) by Pagano; An Introduction to Statistics, 3rd edition (2022) by Carlson and Winquist. Publication manual of the APA (7th Ed.) (two copies available on Koerner Library reference). In addition, I will make short supplemental readings available through Canvas on respective weeks.

**Website:** [canvas.ubc.ca](https://canvas.ubc.ca) (course syllabus, lecture slides, course and lab assignments, discussion forum, and grades)

<b>Lectures:</b>	TTh	11:00 am – 12:20 pm	BUCH A104
<b>Labs:</b>	L01 Th	2:00 pm – 4:00 pm	BUCH B213
	L02 Th	4:00 pm – 6:00 pm	BUCH B215
	L03 F	2:00 pm – 4:00 pm	SWNG 207

<b>Office Hours:</b>	Dr. Oruc – Tuesdays 1:00 – 2:00 pm	Virtual meeting on Zoom
	TA Aaron Reiss – Thursdays 1:00 – 2:00 pm	Virtual meeting on Zoom

We are also easily reached through the discussion forum for this course on Canvas. We will check this forum regularly; all questions about lecture material, assignments and exams should be posted here.

#### Grades

Midterm Exams	45% (15% x 3)
Final Exam	30%
Lab activities	5%
<u>Research Project</u>	<u>20%</u>
<b>total</b>	<b>100%</b>

*Students should retain a copy of all submitted work.*

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**Lectures:** Regular attendance at lectures is recommended. Please note that the lectures and lab sessions will **not** be recorded. Although lecture capture recordings may appear desirable at first sight, their overall pedagogical value has proven to be negative within the context of PSYC 277 for the following reasons:

- Our course has a significant experiential learning component which cannot be replicated via passively watching a recording.
- Availability of lecture recordings creates a false sense of security and over-reliance on an ineffective and inadequate substitute for attending class.
- Active recording of lectures negatively impacts the dynamics of class interaction where some students feel less willing to actively participate due to privacy concerns, are reticent to go on record with questions, and concerned with being taken out of context later.
- Recorded lectures negatively impacts class attendance.

**COVID Safety:** For our in-person meetings in this class, it is important that all of us feel as comfortable as possible engaging in class activities while sharing an indoor space. If you are sick, please stay home – no matter what you think you may be sick with (e.g., cold, flu, other). If you think you might have COVID symptoms and/or have tested positive for COVID and/or are required to quarantine: You can do a self-assessment for COVID symptoms here:

<https://bc.thrive.health/covid19/en>

Do not come to class if you are sick, have COVID symptoms, have recently tested positive for COVID, or are required to quarantine. This precaution will help reduce risk and keep everyone safer. In this class, the marking scheme is intended to provide flexibility so that you can prioritize your health and still be able to succeed:

- All lectures slides and lab session slides will be posted on Canvas.
- There will be no penalty for missing a lecture.
- We automatically drop your two lowest lab assignment scores, so it's OK to occasionally miss a lab session.
- We automatically drop your lowest Midterm score.

If you do miss class because of illness:

- Make a connection early in the term to another student or a group of students in the class. You can help each other by sharing notes. If you don't yet know anyone in the class, post on the discussion forum to connect with other students.
- Consult the class resources on Canvas. We will post all the slides and readings for each class day.
- Use the discussion forum for help.
- Come to office hours (they're online, so you can join from anywhere).
- See the marking scheme for reassurance about what flexibility you have.
- If you are concerned that you will need to miss a particular key activity due to illness, contact us to discuss.

**If I am feeling ill:** If I am unwell, I will not come to class. I will communicate plans for class as soon as possible by email and on Canvas. In this instance, if I am well enough to teach, but am taking precautions to avoid infecting others, we may hold the class online. If this happens, you will receive an email or an announcement in Canvas informing you how to join the class. Our classroom will still be available for you to sit in and attend an online session

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**Exams:** There are three midterm exams, which are not cumulative. Each midterm exam will cover only material that you have not been tested on previously. The final exam is cumulative and will cover the entire course material. Some of the material covered in class is not in the textbook, and some of the material in the textbook will not be covered in class. When it comes to the exams, you are responsible for ALL material covered in class and ALL material in the textbook including figures, definitions and summaries. Exams will not be returned to students, although they may be viewed during the TAs' office hours within posted dates. Any requests for remarking must be made in writing to Dr. Oruc. Grades will be posted on *Canvas* as soon as they are available.

**Required devices:** **a) Calculator.** It is your responsibility to bring one to each exam as needed. It should have basic memory functions and square/square root functions. You will not be permitted to use devices with outside connectivity (e.g., phones). **b) Laptop.** We will use spreadsheet and statistical software as well as other apps to illustrate ideas in class and to carry out lab activities.

**Missed Midterm Exams:** If you miss an exam for a valid reason (see UBC Vancouver Senate's [Academic Concession Policy V-135](#)) you must contact Dr. Oruc **within 72 hours** of the exam date, and submit a request for academic concession. For a missed midterm, the weight will be transferred to the final exam. However, if a student fails to present to their instructor a self-declaration within 72 hours of the missed exam their mark for this exam will be 0. Supplemental exams to improve your grade are not offered in the Department of Psychology.

**Accommodations:** Please let Dr. Oruc know as soon as possible if you will be seeking accommodation through Access and Diversity or if you have religious obligations that will conflict with this course in any way. Students who plan to be absent for varsity athletics, family obligations or similar commitments cannot assume they will be accommodated and should discuss their commitments with Dr. Oruc before the withdrawal date (September 19).

**Academic Integrity:** The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the university policies and codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work; nor should you help others to do the same. For example, it is prohibited to: share your past assignments and answers with other students; work with other students on an assignment when an instructor has not expressly given permission; or spread information through word of mouth, social media, or other channels that subverts the fair evaluation of a class exercise, or assessment. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result, at a minimum, in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences. For further details about Academic Integrity refer to the UBC Calendar link <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,286,0,0#15620>

**Academic conduct in exams:** Some exams will be invigilated via Zoom and it is essential that you have a web-cam to be able to take these synchronous assessments. During invigilated exams, you are required to turn on your camera and leave it on throughout the examination. You may be asked to hold up your student card for identification purposes, and an invigilator may also ask you to share your screen at any point during the exam. To protect the privacy of the students, the camera feed during the invigilation will not be recorded. You are expected to work on the exams by

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yourself—collaboration, the use of course materials, note-sharing websites, discussion boards, and any private communications with anyone other than the instructor and TAs is prohibited.

**Departmental Scaling policy for 2022W:** In order to reduce grade inflation and maintain equity across multiple course sections, all psychology classes are required to comply with departmental norms regarding grade distributions. The average grade for 277 classes will be 81 for an exceptionally strong class, 79 for an average class, and 77 for a weak class, with a standard deviation in the range 8-12. Scaling is not anticipated but may be used in order to comply with these norms; grades may be scaled up or down as necessary by an instructor or the department. Grades are not official until they appear on a student's academic record. You will receive both a percent and a letter grade for this course. At UBC, they convert according to the key below:

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

**University Policies:** UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on [the UBC Senate website](#).

**Learning Outcomes:** In addition to gaining a conceptual understanding and procedural knowledge of behavioural and neuroscientific research design, techniques, and statistical reasoning, you will learn to:

- acquire, analyze and interpret data
- recognize when previous knowledge has to be re-evaluated as a result of new discoveries
- fit newly gained information into a growing framework of understanding
- communicate effectively in writing and orally in a manner acceptable to the audience
- collaborate effectively with other contributing participants in group work with others
- manage projects and course work together with other commitments
- undertake the process of creating new knowledge, how to cite sources honestly, ethically, and transparently

### **Acknowledgment**

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwm̓əθkwəy̓əm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site.

Various sections of this syllabus were inspired and/or adapted from many colleagues across the campus, in particular, Dr. Giaschi, Dr. G. Werker, Dr. Yilmaz, Dr. Rawn, Dr. Luger.

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**Lecture Schedule (Tue & Thurs 11-12:30)**

<b>Week</b>	<b>Topic</b>	<b>Date</b>
1	Introduction Hypotheses and Falsifiability	Sep 8
2	Operational Definitions, Reliability vs. Accuracy	Sep 13
2	Validity of Measures, Variables Measurement Concepts	Sep 15
3	Research Design Fundamentals Non-experimental method	Sep 20
3	Experimental method Random assignment A primer in descriptive statistics: frequency distributions central tendency	Sep 22
4	A primer in descriptive statistics: frequency distributions variability Survey Research	Sep 27
4	Experimental Design	Sep 29
5	Conducting studies	Oct 4
5	<b>Complex Experimental Designs</b>	<b>Oct 6</b>
6	<b>Midterm Exam 1</b>	<b>Oct 11</b>
6	Statistical reasoning: Signal detection theory criterion, internal response, discriminability	Oct 13
7	Statistical reasoning: Special distributions Gaussian distribution Central limit theorem	Oct 18
7	Statistical reasoning: standard normal distribution z-scores, effect sizes	Oct 20

8	Q & A Session	Oct 25
8	<b>Midterm Exam 2</b>	Oct 27
9	Statistical reasoning: parameter estimation sampling distributions	Nov 1
9	Statistical reasoning: confidence intervals, SEM	Nov 3
10	Statistical reasoning: logic of null hypothesis statistical testing framework	Nov 8
10	<b>No class</b> <b>UBC Reading Week</b>	Nov 10
11	Overview of statistical tests suitable in various contexts power, sample size	Nov 15
11	Q & A Session	Nov 17
12	<b>Midterm Exam 3</b>	Nov 22
12	Ethical issues and replication crisis in behavioural and neuroscientific research Criticism of the NHST framework	Nov 24
	<b>group presentations start (4%)</b>	
13	group presentations (L01 1-5)	Nov 29
13	group presentations (L02 1-5)	Dec 1
14	group presentations (L03 1-5)	Dec 6

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**Lab Schedule (L01 Th 2-4pm; L02 Th 4-6pm; L03 F 2-4pm)**

**Lab TAs:** L01: Todd Kamensek    L02: Parsa Delavari    L03: Mojan Izadkhah

<b>Week</b>	<b>Topic</b>	<b>Date</b>
1	Overview and Organization of the Lab Sessions	Sep 8/9
2	Operational Definitions	Sep 15/16
3	Confounding Variables	Sep 22/23
4	<b>no lab</b> <b>National Day for Truth and Reconciliation</b> <b>University closed Friday, Sep 30.</b>	Sep 29/30
5	Practice Project <i>first group check-in for Research Project</i>	Oct 6/7
6	Research Project – proposal development (1/2) <b>develop and submit a draft research proposal and data collection protocol (1pt)</b>	Oct 13/14
7	Research Project – proposal development (2/2) <b>final proposal and data collection protocol due (1pt)</b>	Oct 20/21
8	Research Project – preliminary data organization <b>submit preliminary data visualization (1pt)</b>	Oct 27/28
9	Research Project – final data visualization <b>submit final data sets and graphs (1pt)</b>	Nov 3/4
10	<b>no lab</b> <b>UBC Reading Week</b>	Nov 10/11
11	Research Project – inferential stats <b>submit stats and results statement (2pts)</b>	Nov 17/18
12	Presentation prep and drop in <b>submit final presentation slides on Nov 28</b>	Nov 24/25
13	Group presentations ( <b>4pts</b> ) L01 groups 6-8 L02 groups 6-8 L03 groups 6-8 <b>submit individual project reports on Dec 7 (10pts)</b>	Dec 1/2

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### Guidelines for Group Projects

#### 1. Choose a research group:

This will be done through *Canvas* ("Research Project Groups" tab under "People") starting **Thursday October 6**. Students will assign themselves to groups (6 students/group).

#### 2. Develop a project proposal and data collection protocol:

Each group will develop an original research proposal and a data collection protocol. This will be partly carried out on the lab session on October 13/14. You will receive feedback on your protocols and finalize them during the lab session on October 20/21.

#### 3. Collect data:

This will be done outside of class and lab time between October 20/21 and **November 3/4**. Each group member will contribute to data collection. Make sure to collect part (about half) of your data before the lab session on **October 27/28** for preliminary analyses during which you will merge preliminary group project data, discuss and resolve obstacles encountered during data collection. Graph preliminary group data. Experiment with different plots, discuss best options.

#### 4. Graph your data and submit final datasets:

This will be done during the lab session on **November 3/4**.

Each group will combine their individual data sets. *Each group must hand in data graphs, final datasets by uploading on Canvas.*

#### 5. Perform statistical analysis of your data:

This will be done during the lab session on **November 17/18**. *Each group must hand in statistical analysis of their data and a short report (a few sentences APA style) stating the results of the test by uploading on Canvas.*

#### 6. Prepare your presentation:

This will be done outside of lab sessions. You are also encouraged to use the lab session on Nov 24/25 to get input from your lab TA. Each group member must be involved in the preparation and/or oral delivery of the presentation. Be sure to: give some background on your topic, describe the stimuli, task, data collection and analysis, show your results, interpret your results, discuss problems encountered or things you would do differently, suggest future experiments. Slides of presentations are due **November 28**, to be uploaded on Canvas.

#### 7. Participate in the presentation and peer review sessions:

This will be done during class time on Nov 29, Dec 1 and Dec 6, or during lab sessions on Dec 1 and Dec 2 (make sure to check the Lecture Schedule for each group's assigned date). On these dates, we will watch group presentations followed by a question period and a peer-review period for each group. The presentations will be assessed based on timing, creativity, preparation and organization, completeness, clarity, reference to class material, inclusion of relevant references and ability to answer questions. *A signed list of each group member's role in the presentation and a copy of your slides will be submitted for grading.*

#### 7. Prepare a project report:

This is a typed report, due 5pm on **Wednesday December 7**.

Each student must hand in their own \*unique\* APA style report based on the group data. Organize your report with clearly labeled Introduction (objectives of your project, research question/hypothesis and rationale); Methods (task, conditions, what you measured [dependent



variable], how you measured it, which statistical test you used and why); Results (table showing appropriate descriptive statistics, data graphs, short report of the results of your statistical test, p value, unusual data manipulations, significant difference?); Discussion (answer research question, what did you infer from the data, problems/changes, any concerns or reservations regarding your conclusions; suggestions for future study); References (authors, year, title, journal, volume, page numbers; do not list unless cited). An Appendix may be included, if necessary, to include raw materials, such as surveys. Title page, References and Appendix sections do not count towards the page limit.

*Be sure to include your name, student # and group # on the title page.* The report should be no longer than 5 double-spaced pages (12 pt font).

#### ***Calculation of Research Project Grades***

<b>group proposal</b>	<b>2%</b>
<b>group data graph</b>	<b>2%</b>
<b>group statistical analysis</b>	<b>2%</b>
<b>group class presentation</b>	<b>4%</b>
<b><u>individual research report</u></b>	<b>10%</b>
<b>total</b>	<b>20% of final grade</b>

- A penalty of 10% per day will be applied to late assignments. Assignments received more than 1 week after the due date will not be marked.
- Each student is expected to participate the sessions in which the planning, analysis and group presentation take place. Students who do not contribute to or miss a particular component will lose 2.5% of their final grade unless they have a documented valid excuse. Students will be asked to rate the contributions of their group members after the individual reports have been handed in. Grades may be adjusted for students whose group indicates that their contribution was minimal.
- Each member of a group will receive the group grade, unless they have failed to contribute to the group work (as indicated by a low score on the peer evaluations).