
PSYC 503 - 01	Technology and the Brain	Fall 2021
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Instructor:	Dr. Bryce Geeraert	Lecture Location:	TI Studio A
Email:	blgeerae@ucalgary.ca	Lecture Days/Time:	TR 3:30 – 4:45
Office Hours:	Email me to arrange		

Course Description

We will explore how life in a modern world has changed the way we think, and how new research is changing the way we understand the brain. The impact and implications of modern technologies will be explored through class discussion. Topics will include: an overview of modern brain research, the impact of phones and screen time, rehabilitation from brain injury, into to brain-computer interfaces, and more.

Course Learning Outcomes

The Department of Psychology is committed to student knowledge and skill development. The table below lists the key learning outcomes for this course, the program-learning outcomes they facilitate (see <https://live-arts.ucalgary.ca/psychology/about#program-learning-outcomes>), and expected level of achievement.

Course Learning Outcomes	Assessment Methods	PLO(s)	Level(s)
Demonstrate knowledge of modern technologies developed to investigate the human brain (neurotechnologies).	Written assignments	1,4,5	I
Discuss the ethical implications of modern neurotechnologies and their outcomes.	Written assignments, Class discussion	1,4,6,7,8	I, C
Critically evaluate information in media coverage of the brain and modern technology.	Written assignments, Class discussion	2,4,5,7,8	C
Evaluate the positive and negative impacts of modern technologies that interact with the human brain.	Written assignments, Class discussion	2,4,6,7	C, A
Lead discussion of the design and impact of technologies that interact with the brain.	Class discussion	1,4,5	C, A

Notes. PLOs = Program-Learning Outcomes: 1 = demonstrate knowledge of psychological sciences, 2 = think critically and solve problems, 3 = conduct research and analyze data, 4 = communicate effectively, 5 = demonstrate information literacy, 6 = understand and implement ethical principles in a diverse world, 7 = apply psychological knowledge and skills, 8 = Demonstrate multicultural competence and awareness of issues related to equity, diversity,* and inclusion. Level of PLO achievement facilitated by this course: I = introductory, C = competency, A = advanced.

Acknowledgments and Respect for Diversity

Diversity of identity is a strength and resource. You are encouraged to share your experiences and different perspectives. This will add to a rich learning environment that fosters critical thought through respectful discussion and inclusion.

The Department of Psychology also acknowledges the traditional territories of the people of the Treaty 7 region in southern Alberta. The City of Calgary is also home to Métis Nation of Alberta, Region III.

Lecture Schedule

Date	Topic/Activity/Readings/Due Date
T Sep 7	Class Intro & Unit 1 – Modern Neuroscience: what do we know and how?
R Sep 9	Unit 1 – Modern Neuroscience: what do we know and how?
T Sep 14	Unit 1 – Modern Neuroscience: what do we know and how?
R Sep 16	Neuroscience in media (Class activity)
<i>F Sep 17</i>	<i>Last day to add or swap a course</i>
T Sep 21	Unit 2 – Artificial Intelligence: What is it and how is it used for research? <i>Last day to drop a class without financial penalty</i>
R Sep 23	Unit 2 – Artificial Intelligence: How does it change our daily lives? Due: Assignment #1
<i>F Sep 24</i>	<i>Fee payment deadline for Fall Term full and half courses.</i>
T Sep 28	Unit 3 – Screen Time: Impact on brain development
R Sep 30	National Truth and Reconciliation Day. No lectures.
T Oct 5	Unit 3 – Screen Time: Have phones & computers changed the way we think? Due: Assignment #2 Formative
R Oct 7	Unit 3 – Screen Time: Social media & mental health
<i>M Oct 11</i>	<i>Thanksgiving Day, University closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.</i>
T Oct 12	Unit 4 – Brain Stimulation: Mapping the brain
R Oct 14	Unit 4 – Brain Stimulation: Applications in the clinic Due: Assignment #2
T Oct 19	Unit 4 – Brain Stimulation: Enhancing our cognition?
R Oct 21	Due: Mixed Media Pitches
T Oct 26	Unit 5 – Brain-Computer Interfaces: What are they?

R Oct 28	Unit 5 – Brain-Computer Interfaces: Applications
T Nov 2	Unit 6 – Virtual Reality
R Nov 4	Unit 6 – Virtual Reality <i>Due: Mixed Media Assignment</i>
Nov 7-13	Term Break. No lectures.
W Nov 11	<i>Remembrance Day (Observed). University Closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.</i>
T Nov 16	Unit 7 – The ethics of brain technologies
R Nov 18	Unit 7 – The ethics of brain technologies
T Nov 23	Class Discussions
R Nov 25	Class Discussions
T Nov 30	Class Discussions
R Dec 2	Class Discussions
T Dec 7	Class Discussions
R Dec 9	Final lecture – Class wrap-up <i>Fall Term lectures end. Last day to withdraw with permission from Fall Term half courses.</i>
Dec 11-22	<i>Fall Final Exam Period (no exam scheduled for PSYC 503)</i>

Learning Resources / Required Readings

Weekly readings, including peer-reviewed journal articles, will be posted on D2L at least one week ahead of time.

Assessment Methods

Written Assignment #1 -- <i>(Due Thursday, Sept 23)</i>	20%
Written Assignment #2 preliminary -- <i>(Due T Oct 5)</i>	
Written Assignment #2 -- <i>(Due Thursday, Oct 14)</i>	20%
Mixed Media Pitch -- <i>(Presentations: Thursday, Oct 21)</i>	5%
Mixed Media Assignment -- <i>(Due Thursday, Nov 4)</i>	25%
Class Discussion -- <i>(Presentations: Nov 23 – Dec 7)</i>	30%

Due Dates, Submission Methods, and Late Submissions

- Assignments are **due at the beginning of class (3:30pm)** on the due date.
- Assignments may be submitted via the class D2L dropbox, or a physical copy may be handed in in-person if you prefer.
- Without instructor approval, **late assignments will be penalized 10% per day**, including weekends.
- Missed presentations without instructor approval will result in a mark of 0%. In the case that accommodations are required, be sure to provide as much notice as possible to facilitate attempts to reschedule.

Assignment Descriptions

The following is a brief outline of each assignment. Detailed assignment descriptions and marking rubrics can be found on the class D2L page.

- Unless otherwise specified, written assignments are expected to be double-spaced, 12pt font (Times New Roman, Calibri, or similar), 1" margins.

Written Assignment #1 – Neuroscience Article Review

Choose a news article (not a publication in a scientific journal) that reviews the impact of a specific technology on the human brain or behavior.

Summarize the key points of the article and describe the conclusions drawn by the authors. Then, provide a critical analysis of the strengths and weaknesses of the article. Example points to discuss include: did the authors provide reasonably complete or incomplete coverage of the technology? What scientific evidence or research was provided to support the article? Were the article's conclusions strongly supported by the information provided, or more speculative? Is this article in agreement or disagreement with similar articles on the subject?

Length for this assignment is expected to be 4-5 pages (double spaced). Examples of where to find a neuroscience news article can be found in the full assignment description. If you would like to ensure the article you have chosen is appropriate for this assignment, you may submit the article to Dr. Geeraert by Thursday, September 23rd for review/approval.

Written Assignment #2 – Neurotechnologies Comparison

In this assignment, you will compare and contrast two technologies that interact with the brain in similar ways. For example, you could choose two technologies for brain imaging, two technologies that record brain activity, two technologies used for rehabilitation following brain injury, et cetera. Describe how each technology functions. Then, compare and contrast the two technologies, providing an overview of the strengths and weaknesses of each technology. Example subjects for comparison include: costliness, ease of use, precision or effectiveness of each technology, flexibility, opportunities

for future development of each technology, and more. Describe how each technology is typically applied, and why users may choose each technology over the other.

Length of this assignment is expected to be at least 6 pages (double spaced). As a lead-up to this assignment, on Tuesday, October 5th you will submit a brief, non-graded outline describing the two technologies you have chosen, to ensure you have selected two appropriately comparable technologies. From this outline, Dr. Geeraert will approve your choices of technologies or provide guidance if needed.

NOTE: Mixed media and class discussion assignments (below) will be done as groups of 2-3 students

Mixed Media Pitch

In groups of 2-3, students will give a 3 minute presentation to the class and outline their chosen topic for the Mixed Media Assignment. (see description below). Topics may not overlap between groups, thus an opportunity to sign up for topics will be provided in advance. No more than one Powerpoint slide may be used to support your pitch. The audience will provide feedback on the planned topic, to highlight interesting areas of focus for the mixed media assignment, and eventual Class Discussion.

Mixed Media Assignment

In groups of 2-3 (same group as Mixed Media Pitch), prepare a podcast, podcast script, or article with visuals exploring one type of neurotechnology. Chosen topics may not overlap between groups. Provide an overview of how the technology works, and describe how this technology interacts with the brain. Discuss the applications of this technology, and the impacts of this technology (good or bad).

Recorded podcasts are expected to have a run time of at least 10 minutes. Equivalent length of a podcast script is 5 pages, double-spaced (example format for this script will be provided on D2L). If the group is preparing a written article with visual aids, the text of the article (pictures not included) should be 5 pages, double-spaced.

Class Discussion

In groups of 2-3 (same groups as Mixed Media Assignments), students will lead a 20 minute long class discussion on their chosen type of neurotechnology. As with Mixed Media Assignments, topics may not overlap between groups. Presentations should provide an overview of the function of your chosen technology, and must include an active component to engage the audience and discuss some aspect of the function or outcomes of the neurotechnology. See the detailed assignment description for examples of class activities and topics for discussion.

Audience members will fill out feedback forms for presenters, providing impressions on presentation quality, areas of strength and areas for improvement.

Course Format

This is an in-person class, held on campus.

Prerequisites

PSYC 300 – Research Methods and Data Analysis in Psychology I

PSYC 301 – Research Methods and Data Analysis in Psychology II

Admission to the Psychology major or Honours program

University of Calgary Academic Integrity Policy

Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity.

Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional code of conduct and promote academic integrity in upholding the University of Calgary's reputation of excellence. It is your responsibility to ensure that you have read and are familiar with the student academic misconduct policy:

<https://www.ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf>.

Department of Psychology Criteria for Letter Grades

Psychology course instructors use the following criteria when assigning letter grades:

A+ grade: *Exceptional Performance.* An A+ grade indicates near perfect performance on multiple choice and short answer exams. For research papers/essays/course projects/presentations, an A+ grade is awarded for exceptional work deserving of special recognition and is therefore not a common grade.

A, A- Range: *Excellent Performance.* Superior understanding of course material. Written work is very strong in terms of critical and original thinking, content, organization, and the expression of ideas, and demonstrates student's thorough knowledge of subject matter.

B Range: *Good Performance.* Above average understanding of course material. Written work shows evidence of critical thinking and attention to organization and editing but could be improved in form and/or content.

C Range: *Satisfactory Performance.* Adequate understanding of course material. Knowledge of basic concepts and terminology is demonstrated. Written work is satisfactory and meets essential requirements but could be improved significantly in form and content. Note: All prerequisites for courses offered by the Faculty of Arts must be met with a minimum grade of C-.

D range: *Marginally meets standards.* Minimal understanding of subject matter. Written work is marginally acceptable and meets basic requirements but requires substantial improvements in form and content. Student has not mastered course material at a level sufficient for advancement into more senior courses in the same or related subjects.

F grade: *Course standards not met.* Inadequate understanding of subject matter. Written work does not meet basic requirements. Student has not demonstrated knowledge of course material at a level sufficient for course credit.

Grading Scale

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-95%	B	76-79%	C	63-66%	D	50-53%

A- 85-89% B- 72-75% C- 59-62% F 0-49%

It is at the instructor's discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades.

To determine final letter grades, final percentage grades will be rounded up or down to the nearest whole percentage (e.g., 89.5% will be rounded up to 90% = A, but 89.4% will be rounded down to 89% = A-).

Course Credits for Research Participation

Extra research participation course credit is not offered for this course.

Supporting Documentation

Students may be asked to provide supporting documentation for an exemption/special request. This may include, but is not limited to, a prolonged absence from a course where participation is required, a missed course assessment, a deferred examination, or an appeal. Students are encouraged to submit documentation that will support their situation. Supporting documentation may be dependent on the reason noted in their personal statement/explanation provided to explain their situation. This could be medical certificate/documentation, references, police reports, invitation letter, or a statutory declaration, etc. The decision to provide supporting documentation that best suits the situation is at the discretion of the student. Students cannot be required to provide specific supporting documentation, such as a medical note.

Students can make a Statutory Declaration as their supporting documentation (available at ucalgary.ca/registrar). This requires students to make a declaration in the presence of a Commissioner for Oaths. It demonstrates the importance of honest and accurate information provided and is a legally binding declaration. Several registered Commissioners for Oaths are available to students at no charge, on campus, please see ucalgary.ca/registrar.

Falsification of any supporting documentation will be taken very seriously and may result in disciplinary action through the Academic Discipline regulations or the Student Non-Academic Misconduct policy.

Reappraisal of Graded Term Work <http://www.ucalgary.ca/pubs/calendar/current/i-2.html>

Reappraisal of Final Grade <http://www.ucalgary.ca/pubs/calendar/current/i-3.html>

Academic Accommodations

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at <https://www.ucalgary.ca/legal-services/university-policies-procedures/accommodation-students-disabilities-procedure>.

Academic Misconduct

For information on academic misconduct and its consequences, please see the University of Calgary Calendar at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

Instructor Intellectual Property

Course materials created by professor(s) (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the professor(s). These materials may NOT be reproduced, redistributed or copied without the explicit consent of the professor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

Copyright Legislation

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

Freedom of Information and Protection of Privacy

Student information will be collected in accordance with typical (or usual) classroom practice. Students assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary

Student Support and Resources

<https://www.ucalgary.ca/registrar/registration/course-outlines>

Important Dates

The last day to drop this course with no "W" notation and **still receive a tuition fee refund** is **Thursday, September 16, 2021**. Last day add/swap a course is **Friday, September 17, 2021**. The last day to withdraw from this course is **Thursday, December 9, 2021**. These dates are noted on the lecture schedule above. <https://www.ucalgary.ca/pubs/calendar/current/academic-schedule.html>