Psychology
UNIVERSITY OF TORONTO

PSY4931S: Cognitive Neuroscience
Tuesdays and Thursdays 10 am - 1 pm
SS 1088

Course Delivery

This is an in-person course. Students are expected to attend lectures in-person whenever possible. Every attempt will be made to provide complete recordings of all lectures, however, recordings may not be available if there are technical difficulties with the recordings. You must attend in person to get the attendance credit.

If external circumstances change (e.g. public health guidelines, instructor illness/quarantine, etc.), the course may need to move online for one or more lectures.

Contact Information

Course Instructor
Dr. Christine Burton
christine.burton@utoronto.ca

Office hours
Sign-up for office hours required at
https://calendly.com/christine-burton/office-hour-1

All office hours will be individual 15-minute appointments during the following times :

Tuesdays 2 - 3pm online only
Wednesdays 10 - 11 am online or in person (SS 4001)

Teaching Assistant
Negar Mazloum-Farzaghi
n.mazloum@mail.utoronto.ca

Negar will be available to meet with students after the distribution of graded tests and assignments.

Course Description

This is a capstone lecture course surveying research on how the mind arises from the brain. The first objective of the course is to understand how processes in human brains (ranging from the firing of a single neuron to the dynamics of billions) support cognitive abilities (such as recognizing a face, remembering a birthday from childhood, understanding the words in a spoken lecture, or planning a route home from class). The second objective of the course is to understand the methods of contemporary cognitive neuroscience research, to enable students to read primary literature and to understand ongoing debates.

Prerequisites: PSY201H1/ ECO220Y1/ EEB225H1/ GGR270H1/ IRW220H1/ POL222H1/ SOC202H1/ STA220H1/ STA238H1/ STA248H1/ STA288H1/ ECO220Y5/ PSY201H5/ STA215H5/ STA220H5/ PSYB07H3/ STAB22H3/ STAB23H3/ STAB57H3, ***and one of*** PSY260H1/ PSYB38H3 ***or*** PSY270H1/ PSY270H5/ PSYB57H3/ COG250Y1 ***or*** PSY290H1/ PSY290H5/ PSYB64H3/ HMB200H1/ PSL300H1
Exclusions: PSY393H5/ PSYB55H3/ PSYC31H3

It is your responsibility to ensure that you have met all prerequisites listed in the Psychology section of the A&S Calendar for this course. If you lack any prerequisites you WILL BE REMOVED.

Learning Outcomes

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

- Describe the major anatomical divisions of the central nervous system and the connectivity between them
- Identify the brain regions that produce complex human behaviour and describe the role those regions play
- Explain how multiple cortical and subcortical structures interact to control complex behavior
- Describe the behavioural deficits that result from brain damage
- Explain what researchers have learned about brain function by studying patients with brain damage
- Interpret primary research and effectively synthesize information in a growing field of knowledge
- Produce clear and succinct summaries of published research and identify gaps in knowledge

Reading Material

Recommended: Gazzaniga, M., Ivry, R. & Mangun, G. (2018). Cognitive Neuroscience: The Biology of the Mind (5th ed). Norton Publishers.
You can purchase the book from the U of T bookstore here: https://www.uoftbookstore.com/adoption-search-results?ccid=7562800&itemid=61697

A hard copy of the textbook available at Gerstein library.

Course Evaluation

Anatomy and methods Quercus quiz	Due July 10 at 11:59 pm	5%	Literature search tasks	See course outline for due dates	3 @ 5% each = 15%
Term test 1	July 17	25%	Integrative review	August 14	20%
Term test 2	August 12	30%	Kahoot participation	Ongoing	5%

Assessment Details

Tests (worth 60% of final course grade)

It is essential that you have a basic understanding of brain anatomy as you progress through the material in this course. In order to encourage you to learn this anatomy, there will be a take-home quiz testing this material early in the course. **The quiz will be available to complete on Quercus between July 8 at 1 pm and July 10 at 11:59 pm.** You will have 1 hour to complete the quiz once you have started it and 1 opportunity to submit your answers.

The term tests will assess your knowledge of the material covered in lectures. The tests will consist of multiple choice questions as well as short and long answer questions. Short answer questions will target knowledge of specific facts, and long answer questions will target depth of understanding and critical reasoning. The tests will be held in our classroom during class time.

Written assignments (worth 35% of final course grade)

The goal of the assignments is to to help you engage with published research, think critically about how we study the brain, and apply scientific thinking in a thoughtful, informed way.

There are two main components in the written portion of the course evaluation. Details about the assignments will be posted on Quercus.

1. **Literature search tasks** (3 @ 5% each): Research in the area of cognitive neuroscience is growing exponentially as new brain imaging technology emerges. The results of this research are often conflicting and can sometimes seem confusing, so it is important that you know what you are looking for. The goal of the literature search tasks is to help you see the forest for the trees! That is, the assignment is intended to direct you to find a common theme among details. You will be given 3 literature search tasks, each with a specific goal. The primary focus of these assignments will be the information gathering and synthesis, but you will be expected to submit a short written summary of your search. The summary is meant to help you focus on important information when reading research articles or when designing your own research.
2. **Final integrative review** (20%): In this assignment you will create a critical review that brings together findings from at least two of your literature search tasks. Your goal is to synthesize what the research shows, evaluate its strengths and limitations, and identify gaps or open questions that could guide future research. The final assignment should be no more than 2000 words (approximately 8 double-spaced pages).

Participation (worth 5% of final course grade)

Research has demonstrated that a good way to learn material is to be tested on it. With that goal in mind, I will prepare practice test questions that you will participate in during each lecture using the free app "Kahoot" (kahoot.com). These questions will be scored based on participation only (10 weeks X 0.5% each = 5%). You must attend in person to get the credit, but an asynchronous option will be available so that you can use the quiz questions to practice for the term tests. You can miss **one** Kahoot quiz and still get the full 5% participation credit.

Class Schedule

Date	Topic	Readings
July 3	Introduction, history, and methods	Chapters 1 & 3
July 8	Brain structure	Chapter 2
July 10	Perception **Anatomy asynchronous quiz due**	Chapters 5 & 6
July 15	Action **Literature search task 1 due**	Chapter 8
July 17	**Term test 1**	
July 22	Attention	Chapters 7
July 24	Memory **Literature search task 2 due**	Chapter 9
July 29	Language	Chapter 11
July 31	Cognitive control **Literature search task 3 due**	Chapter 12
August 5	Emotion	Chapter 10
August 7	TBD: Cerebral asymmetry OR Consciousness	Chapter 4 OR chapter 14
August 12	**Term test 2**	

IMPORTANT COURSE POLICIES **PLEASE READ**

Course webpage

This Course 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. New information and resources will be posted regularly as we move through the term. To access the course website, go to the U of T Quercus log-in page at https://q.utoronto.ca. SPECIAL NOTE ABOUT GRADES POSTED ONLINE: Please also note that any grades posted are for your information only, so you can view and track your progress through the course. 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.

Email

The main source of communication for the course will be email. Please include the course code (PSY493) in the subject line in all your emails about the course. **Please avoid sending me messages directly from Quercus/Canvas because I don't monitor it regularly.** I will respond to emails as soon as I can in the order I receive them. Please note that I don't regularly respond to emails during evenings and on weekends.

Missed Test Special Consideration Request Process

If you miss a test for reasons beyond your control (illness or accident), please contact me with documentation in support of your specific circumstances within one week of the missed test. 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.

If your request is approved, you will have ONE opportunity to write each make-up test. If you miss term test 1 and make-up test 1, and can provide supporting documentation for your absence, the weight of the missed test will be added to term test 2.

Requests for Re-grading

All requests to re-grade tests or assignments must be made within 2 weeks of receiving your grade. **Please direct all requests for re-grading directly to the person who marked your work.** If you are dissatisfied after meeting with the TA you may submit your work to the instructor. Keep in mind that if you submit your work to be re-graded, your grade could go up or down. This policy applies to work submitted to the instructor or the TAs.

Accommodations for Personal Reasons

There may be times when you are unable to complete course work on time due to non-medical reasons. If you have concerns, speak to me. Extensions for term work can be arranged on a case-by-case basis. It is also a very good idea to speak with an advisor in your College Registrar's office; they can support you in requesting extensions or accommodations, and importantly, connect you with other resources on campus for help with your situation.

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.

Penalties for Lateness

The penalty for lateness is 5% of the total per calendar day.

Students who seek to be granted more time to complete their term work beyond the due date without penalty, owing to circumstances beyond their control (e.g., illness, or an accident), must do so by submitting a request directly to the instructor for the period up to and including the last day of the final assessment period. All requests for extensions must include supporting documentation, which can include an ACORN absence declaration, a VOI form, or an email from a U of T student support office (e.g. College registrar, Accessibility Services, etc).

*Any term work that will be handed in **after** the final assessment period is subject to a petition for extension of term work. This petition should be filed with the student's College Registrar's Office.*

Plagiarism Detection Tool

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).

Students who wish to opt-out of using the University's plagiarism detection tool for the case study assignment must notify the instructor (via Quercus inbox message/email) no later than 5PM on September 20. Upon receipt of notification, the instructor will request that the student provide all rough work (including, but not limited to, call numbers and/or URLs for all cited sources) when submitting their case study assignment.

Academic Integrity and Plagiarism

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters (https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019). If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to me. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources. For example, 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 A&S Student Academic Integrity (https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity) and the University of Toronto Website on Academic Integrity (https://www.academicintegrity.utoronto.ca).

Use of Generative AI

In this course, you may use generative artificial intelligence (AI) tools, including ChatGPT, Microsoft Copilot, and GitHub Copilot, as learning aids, however, you should not use generative AI to produce any written work in the course. For example, you may use generative AI to help you brainstorm topic ideas or to check APA formatting, but none of your assignments should include content generated by AI. You will not be permitted to use generative AI on the midterm test or final exam. While some generative AI tools are currently available for free in Canada, please be warned that these tools have not been vetted by the University of Toronto and might not meet University guidelines or requirements for privacy, intellectual property, security, accessibility, and records retention. Generative AI may produce content which is incorrect or misleading, or inconsistent with the expectations of this course. These tools may even provide citations to sources that don't exist—and submitting work with false citations is an academic offense. These tools may be subject to service interruptions, software modifications, and pricing changes during the semester.

***Generative AI is not required to complete any aspect of this course**, and we caution you to not rely entirely on these tools to complete your coursework. Instead, we recommend treating generative AI as a supplementary tool only for exploration or drafting content. Ultimately, you (and not any AI tool) are responsible for your own learning in this course, and for all the work you submit for credit. It is your responsibility to critically evaluate the content generated, and to regularly assess your own learning independent of generative AI tools. Overreliance on generative AI may give you a false sense of how much you've actually learned, which can lead to poor performance on the midterm test or final exam, in later courses, or in future work or studies after graduation.*

Privacy and Copyright Disclaimer

Notice of video recording and sharing (Download permissible; re-use prohibited)

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.

Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructor.

For questions about the recording and use of videos in which you appear, please contact your instructor.

Academic Resources

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 at https://www.psych.utoronto.ca/current-program-students/guidance-undergraduate-students-psychology 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.

Course Conflicts

Students are not permitted to enrol in two courses that have overlapping schedules or conflicting components, such as lectures, tutorials, labs, or assessments. If a student chooses to ignore this policy and enrols in courses with scheduling conflicts, it is their responsibility to manage any resulting issues. Instructors are not obligated to provide accommodations for missed term tests, quizzes, assignments, or other course requirements due to such conflicts (see https://psych.utoronto.ca/current-program-students/guidance-undergraduate-students-psychology#enrolment-concerns-accordion-4). Students are strongly advised to review their course schedules carefully and consult with the College Registrar's Office if needed before finalizing their enrolment.

Accessibility Needs

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 https://studentlife.utoronto.ca/department/accessibility-services/. 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.

Writing

As a student here at the University of Toronto, you are expected to write well. The university provides its students with a number of resources to help them achieve this. For more information on campus writing centres and writing courses, please visit http://www.writing.utoronto.ca/.

English Language Learning

English Language Learning (ELL) supports all U of T undergraduates enrolled in the Faculty of Arts & Science whose first language is not English (multilingual students), as well as native speakers seeking to improve their English language skills. Our mini-courses and other activities are designed and taught by U of T professors, and they free. For more information, please visit https://www.artsci.utoronto.ca/current/academic-advising-and-support/english-language-learning

Academic Success

The Centre for Learning Strategy support helps you identify and achieve your learning goals. You have a lot more going on in your life than just academic responsibilities, and they can help tailor your learning supports to fit you. You will find a number of courses, workshops, and one-on-one appointments to help improve many different skills related to academic achievement. https://studentlife.utoronto.ca/department/academic-success/