

# PSY 493F1S – Cognitive Neuroscience

Fall 2024 / Thursdays from 6PM-9PM EST // UC 85

Course Website: <https://q.utoronto.ca>

Instructor: Hannah Marlatte ([hannah.marlatte@mail.utoronto.ca](mailto:hannah.marlatte@mail.utoronto.ca))

Office Hours: Online by appointment

<https://calendly.com/hannahmarlatte/officehours>

Teaching Assistant: Debanjan Borthakur ([debanjan.borthakur@utoronto.ca](mailto:debanjan.borthakur@utoronto.ca))

Office Hours: TBD

## 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

**Exclusion:** 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.

## Course Materials:

### Textbook (suggested, not required):

Banich, M. T., & Compton, R. J. (2023). Cognitive Neuroscience (5th ed.): Cambridge University Press.

*Note: Previous editions have mostly similar content, if that is more accessible to you.*

### Research Articles (required):

Primary research articles will be assigned each week and are listed below in the course schedule – these will also be made available on Quercus.

## Course Description

This is a survey course in cognitive neuroscience. The course focuses on the neural substrates of mental processes including perception, attention, memory, language, cognitive control, emotion and social cognition, and their application in psychiatric disorders. The goal of this course is to provide a basic understanding of the neural processes that support human cognition, research methodology, and on-going debates within the field.

## What will you learn?

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

- 1) Demonstrate knowledge about the scientific study of how the human brain enables cognition from both historical and current perspectives
- 2) Evaluate research in the field of cognitive neuroscience through understanding
  - a. current theoretical, conceptual, and methodological issues, and
  - b. the fields relationship and relevance to other fields (e.g. medicine) or subfields (e.g. clinical psychology)
- 3) Apply your understanding by proposing and assessing novel research
- 4) Further develop your critical thinking, communication, and writing skills

## Who is your instructor?

My name is **Hannah Marlatte** ([hannah.marlatte@mail.utoronto.ca](mailto:hannah.marlatte@mail.utoronto.ca)). I research how experiencing trauma can impact people's ability to imagine new scenarios and explore their surroundings, and how these changes manifest in the brain. Additionally, I study how physiological stress and focal brain damage impact memory processes.

The teaching assistant is **Debanjan Borthakur** ([debanjan.borthakur@utoronto.ca](mailto:debanjan.borthakur@utoronto.ca)). Please reach out to him if you need help reviewing course content, have questions about the assessments, or would like any advice about the course.

## How will this course be structured?

### Lectures

Lectures will take place in person every Thursday between 6-9PM EST in UC 85. Each lecture, we will introduce and discuss important concepts of the course. I encourage you to take notes and ask any questions you have to clarify and expand on the material covered. You will be responsible for material covered during the lectures for the tests.

### Readings

The textbook is optional and used to supplement the content that is covered in class. Assigned chapters will review or expand on concepts we cover during the lectures. There will also be one research article assigned each week related to the concepts being covered. To get the most out of this class, I suggest completing all readings before the lecture. Short summaries of the papers will be posted 1 hour before each respective class to help clarify parts of the methods and results that might be confusing.

### Quercus

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, so please make it a habit to log in to the site on a regular basis.

## **How will we communicate?**

I will try to facilitate as much communication as possible in this course—I encourage you to communicate whether you want to clarify concepts you might not understand, further explore certain topics you are interested in, have questions about the real-world application of the topics we cover, or want to re-clarify a grading decision.

Most general questions related to course content, policies, or assessments should first be posted to the Quercus Discussion Board – this will not only help yourself, but many of your classmates will likely have the same question! You are encouraged to both ask and respond to questions on the Discussion Board. The TA and I will be monitoring the board as well. Conceptual questions would be best saved for office hours.

You can schedule one-on-one office hours by appointment with me using the following website (<https://calendly.com/hannahmarlatte/officehours>). During office hours, we can talk about anything that you are curious about, whether it's about material in the course, ideas for assignments, or questions about research/careers. If you cannot find a time that works for you, please email me to schedule something.

For any issues regarding verification of illness, accessibility concerns, or other concerns specific to the course structure, you can email me directly.

For all forms of communication, please use proper punctuation, spelling, grammar, complete sentences, etc., and use your University of Toronto email account. When emailing myself or the TA, please include "PSY493" in the subject line, along with a brief description. We will try our best to respond to all emails within 2 business days. Responses may be delayed during especially busy times, so I recommend going over the syllabus, website, and Discussion Board to see if your question has already been answered.

## **What will we be doing?**

### **Tests – 50%**

There will be two term tests (worth 25% each), each consisting of multiple choice and short answer questions. Tests are non-cumulative and will primarily cover material from the lectures prior to the test – however, some questions will require integration of material covered across the course, so don't forget what you have learned! The questions are designed to not only test your knowledge of the course material but also your ability to apply concepts in novel situations. Test material will primarily come from the lectures but will also include material from the assigned readings. Students are

responsible for attending lectures and reading the assigned articles, as lectures will not cover all material contained in the readings (and vice versa). Tests will be in person and during our normal class time and place.

### **Research Paper – 40%**

The major writing component of this course is to write a 2000-word research proposal following APA-style. You will propose a new original study which addresses a current gap in the literature. This allows you a chance to apply your knowledge of cognitive neuroscience theory and methodology on a specific topic of interest to you, practice the collaborative nature of research, and helps develop your ability to critically evaluate research design. Submission of your research proposal will be done in 4 steps:

#### **Step 1 – Paper Outline – 5%**

You will first submit a 1-page single-spaced outline of your proposal. This is to allow you to plan your paper early on and to make sure your topic is suitable through feedback provided by the teaching team.

#### **Step 2 – Full Draft – 5%**

Next, you should submit a complete draft of your proposal that includes all components of the assignment. This is not meant to be a rough or unfinished version of the paper – rather, consider this step as if you were submitting to a journal publication for peer review.

These will be marked for completion, within reason – if you indicate that you have thought critically about the research idea, relevant theory, and methodology, you will receive full points for this step. Note that if you submit your draft late, you will receive a zero for this portion and may not receive peer feedback. You must first submit a draft before you can receive a classmate's proposal to get a chance to peer-review.

#### **Step 3 – Peer Review – 5%**

After submitting your draft, you will be assigned one paper authored by an anonymous classmate to peer review. You will have one week to give constructive feedback on their proposal, which can include: tips on their framing of the relevant research, their success in addressing a gap in the literature, help making appropriately methodological decisions to fulfill their research goal or providing writing support.

You will be graded on the collegiality, completeness, and quality of the peer review that you provide your classmate. Late peer review submissions will receive no credit.

#### **Step 4 – Final Draft – 25%**

Finally, submit the final version of your research proposal that has been refined to consider the feedback you received in your peer review.

The evaluation of the final version of your proposal will be based on your understanding and integration of previous literature, your ability to articulate a clear and relevant research goal that both emerges from your literature review and has testable hypotheses, and your application of methodology.

### **Engagement – 10%**

For any course, the deeper you engage with the material, the more likely you are to integrate the new information with knowledge you already have and apply it to new situations. We also all bring unique prior knowledge and experiences to the class, which can help us make new connections we otherwise wouldn't on our own. Therefore, I highly encourage engagement with the material and each other to support your learning. This will be assessed in written reflections on the assigned readings and completing two check-in surveys.

### **Article Reflections – 3% each x 3, starting Jan 23**

To foster thoughtful in-class discussion, you will complete three small reflections (200 words max) about the assigned readings throughout the term.

This kind of reflection paper is an analysis of an observation you made while reading, not a summary of the reading or a stream of consciousness on paper. There is flexibility in how you decide to approach each reflection: you can discuss an alternative explanation to their findings, a research choice they made that you disagreed with, or some connection you made either within or outside the course. These reflections are to help you think critically about the papers while reading them, which in turn should help you contribute to class discussions, can provide ideas for your research proposal, and provides practice in critically reading—which you will do within this course (i.e. peer review of final paper) and beyond. Although it is not expected for you to cite other sources, these are still formal pieces of writing and should use full sentences, display a depth of thought, and be informed by course content.

You can choose which three of the eight content weeks (excluding Week 1 and 2 which focus on methodology) you would like to write reflections for, however at least one needs to be completed before Reading Week (i.e. by Feb 11). Reflections on a given article are due 2 hours before that week's class at 3:59PM EST. Late reflection submissions will not receive credit.

### **Survey Participation – 1% for both**

Check-in surveys provide a way for you to communicate with me about the course. The introduction survey helps me get to know you better and what you are looking to get out of the course. The midterm survey is completed anonymously and lets me know what is working and if anything needs to be adjusted.

## What is the course schedule?

Week	Date	Topic	Readings	Due
1	Jan 9	Neurophysiology	Chapter 1 Logothetis (2008)	Introduction survey – due Jan 14 @ 11:59 EST
2	Jan 16	Neuroanatomy Methods	Chapters 2, 3 Smith et al. (2009)	
3	Jan 23	Vision	Chapters 5, 6, 7.1 Haxby et al. (2001)	Article reflections begin – due @ 3:59PM EST
4	Jan 30	Motor Control Audition	Chapter 4, 5.6 Gordon et al. (2003)	
5	Feb 6	--- TERM TEST 1 ---		
6	Feb 13	Language	Chapter 8 Andrews et al. (2022)	Paper outline – due Feb 14 @ 11:59PM EST
	Feb 20	--- READING WEEK ---		
7	Feb 27	Attention	Chapter 10 Peelen & Kastner (2011)	Mid-term survey – due Mar 4 @ 11:59 EST
8	Mar 6	Cognitive Control	Chapter 11 Bonelle et al. (2016)	
9	Mar 13	Memory	Chapter 9 Audrain et al. (2022)	Paper draft – due Mar 14 @ 11:59PM EST
10	Mar 20	Emotion Social Brain	Chapters 12, 13.2 Di Nicola et al. (2020)	Paper peer review – due Mar 21 @ 11:59PM EST
11	Mar 27	Psychiatry Consciousness <b>Guest Lecture:</b> Plasticity	Chapters 14.2, 16.5 Drysdale et al. (2017)	Paper final draft – due Mar 28 @ 11:59PM EST
12	Apr 3	--- TERM TEST 2 ---		

# What are the course policies?

## Community Guidelines—to be created together on Week 1

### Academic Misconduct Policy

The University of Toronto takes its commitment to academic integrity very seriously— as such, there are serious consequences for instances of academic misconduct. Behaviours that constitute academic offences are outlined in the University of Toronto's Code of Behaviour on Academic Matters and will be investigated following procedures outlined there (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>). This includes submitting the work of another (whether in part or in whole) as your own, possessing prohibited materials while writing tests, and providing or receiving assistance from another student unless explicitly permitted to do so. Unless explicitly stated, all homework, writing, assessments, etc. submitted for a grade for this class must be done independently.

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>).

### 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. 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. 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.

### Accommodation 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 or to an advisor in your College Registrar's office; they can help you to decide if you want to request an extension or

other forms of academic consideration. They may be able to email your instructors directly to provide a College Registrar's letter of support and connect you with other helpful resources on campus.

### **Missed Test Policy**

Missed tests without providing valid documentation will be treated as zeros. A make-up test will be arranged should you miss Term Test 1 or Term Test 2 with valid documentation as described in the Specific Medical Circumstances, or through the College Registrar or Accessibility Services. You must contact me within one week from the date of missing the test and submit proper documentation. If an absence extends beyond 7 consecutive days, or if you have a non-medical personal situation preventing you from completing your academic work, you should connect with the College Registrar. They can provide advice and assistance reaching out to instructors on your behalf.

### **Late and Extension Policy**

Late submission of the paper outline and final paper will be penalized 10% for each day after the deadline, to a maximum of 4 days (40%) after which papers will no longer be accepted. In the case of extraordinary circumstances, I encourage you to email me. Please include the appropriate details and we will set up a time to discuss on a case-by-case basis. Extensions will only be granted for rare circumstances and will only be accepted with the accompanying documentation. Please email me at least 72 hours before an assignment is due to request an extension.

All other assignments (paper draft, peer review, and reflections) will not be accepting late submissions, therefore any submissions after their due date will receive a zero.

### **Grading Dispute Policy**

If you believe that your assignment was graded unfairly, please first wait for at least 24 hours following the return of the assignment before contacting us. Afterwards, you can contact the TA with details on where you think something was overlooked to set up a meeting to review your assignment. If you still feel as if your assignment was graded unfairly following this meeting, you can email me a short paragraph detailing your grade concern to request a regrade – grade disputes are not to be directed to your TA. Keep in mind that the regrade is final and your mark could go up, go down, or stay the same. Requests must be made no later than two weeks from when the work was returned.

### **Audio Recording and Lecture Materials Usage Policy**

Recordings are only for personal use and may not be shared with other students or distributed online unless permission is granted. Note that your participation may be recorded on audio/video and be made available to students in the course for viewing remotely and after each session.

Materials provided by me and the TA (including, but not limited to, the syllabus, lecture slides, handouts, recordings, etc.) are to be used by yourself and the other class members only. They are not to be posted in any public access forum or otherwise



distributed without explicit permission from your instructor. Non-compliance with these terms violates an instructor's intellectual property rights and the Canadian Copyright Act. Students violating this agreement will be subject to disciplinary actions under the Code of Student Conduct.

### **Harassment, Discrimination and Classroom Etiquette**

The University of Toronto is a diverse community and is committed to providing an environment free of any form of harassment, misconduct, or discrimination. In this course, I seek to foster a civil, respectful, and open-minded climate in which we can all work together to develop a better understanding of key questions and debates through meaningful dialogue. As such, I expect all involved with this course to refrain from behaviours that intimidate, humiliate, or demean persons or groups or that undermine their security or self-esteem based on traits related to race, religion, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, gender identity, gender expression, age, marital status, family status, disability, receipt of public assistance or record of offences.

It is important that together we understand what is deemed respectful and accessible to each other, which allows us to create a safe, equitable, and productive space for learning for everyone. If there is anything to be addressed or any access needs that may impact your ability to engage or participate in the course, please let me know.

### **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 <https://studentlife.utoronto.ca/departments/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.

### **Religious Accommodations**

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of cultural and religious traditions. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (such as a test or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

## **Mental Health and Well-being**

Your mental health is important. Throughout university life, there are many experiences that can impact your mental health and well-being. As a University of Toronto student, you can access free mental health and wellbeing services at Health & Wellness (<https://studentlife.utoronto.ca/departments/health-wellness/>) such as same day counselling, brief counselling, medical care, skill-building workshops, and drop-in peer support. You can also meet with a Wellness Navigation Advisor who can connect you with other campus and community services and support. Call the mental health clinic at 416-978-8030 ext. 5 to book an appointment or visit <https://uoft.me/mentalhealthcare> to learn about the services available to you.

You can also visit your College Registrar to learn about the resources and supports available: <https://www.artsci.utoronto.ca/current/academic-advising-and-support/college-registrars-offices>

If you're in distress, you can access immediate support: <https://uoft.me/feelingdistressed>

## **Writing**

Good writing skills are crucial in university, and I believe something we are all able to improve upon. 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/>.

## **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 website (<https://uoft.me/pdt-faq>).

## **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 (<https://www.psych.utoronto.ca/current-program-students/guidance-undergraduate-students-psychology#coursework-grades-accordion-5>). 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.