

PSY 493H Cognitive Neuroscience

Winter 2022 | revised Jan 26, 2022

Instructor Dr. Meg Schlichting
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 Questions? Ask in class, on Quercus, or make an appointment:
calendly.com/schlichting/10-minute-meeting-office-hours

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***Email** Email is ONLY to be used for genuine emergencies. Neither the instructor nor the TA will be able to respond to emails regarding course content.

Class Time Mondays 1-4pm

Text Gazzaniga, Ivry & Mangun. (2018). Cognitive Neuroscience (5th ed.): Norton Press.

Prerequisites PSY201H1 or equivalent, PSY260H1 / PSY270H1 / PSY290H1 / HMB200H1 / HMB204H1 / NRS201H1. 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. Visiting students from other universities should have the equivalent prerequisites from their home institutions. If you lack any prerequisites you will be removed. No waivers will be granted.

Objectives This is a capstone 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, including memory, language, and decision making. The second objective of the course is to understand and critically evaluate the methods of contemporary cognitive neuroscience research through reading primary literature and engaging in ongoing debates.

Marking Scheme

Assignment	Weight	Due Date
Term Tests (3)	16% each	Jan 31 st -Feb 1 st , Mar 7 th -8 th & Apr 4 th -5 th
Reading Quizzes	7% (1% each)	weekly
MRI Neuroanatomy	5%	January 14 th
Paper Discussions [PD]	6% each	Jan 21 st /28 th , Feb 11 th /18 th
Paper Topic Approval	0%	March 4 th
Paper Draft	4%	March 18 th
Paper Peer Review	4%	March 25 th
Term Paper	20%	April 1 st

Provisional Course Overview, + see Required Readings for full article citations

Wk	Lec	Week of	Topic	Readings	Due (Fridays by 11:59pm)	
					Quiz	Assignment
1	1	Jan 10	Course Overview & Methods	Chapter 3; QALMRI; Syllabus	Prac.	MRI Neuroanatomy
2	2	Jan 17	Cells & Functional Anatomy	Chapter 2; NYT Methods article; [PD1]+ Jiahui et al. (2018)	✓	Draft Responses for Paper Discussion [PD] 1 (Jiahui et al., 2018) Due: Jan 21
3	3	Jan 24	Visual Perception & Object Recognition	Chapters 5-6	✓	Participate in group PD1 this week Date range: Jan 22-28 Final Responses for PD 1 Due: Jan 28
4		Jan 31	Test 1 (Jan 31st-Feb 1st)			
5	4	Feb 7	Language & Semantics	Chapter 11; [PD2]+ Rose et al. (2016)	✓	Draft Responses for PD 2 (Rose et al., 2016) Due: Feb 11
6	5	Feb 14	Memory 1	Chapters 12.3 (Working Memory) & 9.3 (Short-Term Memory)	✓	Participate in group PD2 this week Date range: Feb 12-18 Final Responses for PD 2 Due: Feb 18
		Feb 21	No class: Reading Week			
7	6	Feb 28	Memory 2	Chapter 9; + Brown et al. (2016)	✓	Term Paper Topic Approval
8		Mar 7	Test 2 (Mar 7th-8th)			
9	7	Mar 14	<i>Guest Lecture by Sagana Vijayarajah: Attention & Cognitive Control</i>	Chapters 7 & 12.1, 12.2, 12.6; + Spadone et al. (2015)	✓	Complete Draft of Term Paper
10	8	Mar 21	Emotion & Decision-Making	Chapters 10.1-10.6, 12.4; OPTIONAL —NYT emotion article	✓	Peer Review
11	9	Mar 28	Consciousness	Chapter 14; OPTIONAL —+Fernández-Espejo & Owen (2013)	✓	Final Term Paper
12		Apr 4	Test 3 (Apr 4th-5th)			

Required Readings

Lecture 2: NYT Methods Op-Ed and Response:

Iacoboni, M., Freedman, J., Kaplan, J., Jamieson, K. H., Freedman, T., Knapp, B., & Fitzgerald, K. (2007, November 11). Op-Ed: This Is Your Brain on Politics. *The New York Times*.

Aron, A. R., Badre, D., Brett, M., Cacioppo, J. T., Chambers, C., Cools, R., ... Winkielman, P. (2007, November 14). Letter: Politics and the Brain. *The New York Times*.

Lecture 8: NYT emotion article:

OPTIONAL—Barrett, L. F. (2015, July 31). What Emotions Are (and Aren't). *The New York Times*, pp. 2–5.

All other readings:

Brown, T. I., Carr, V. A., LaRocque, K. F., Favila, S. E., Gordon, A. M., Bowles, B., ... Wagner, A. D. (2016). Prospective representation of navigational goals in the human hippocampus. *Science*, 352(6291), 1323–1326.

OPTIONAL—Fernández-Espejo, D., & Owen, A. M. (2013). Detecting awareness after severe brain injury. *Nature Reviews Neuroscience*, 14(11), 801–809.

[PD1] Jiahui, G., Yang, H., & Duchaine, B. (2018). Developmental prosopagnosics have widespread selectivity reductions across category-selective visual cortex. *Proceedings of the National Academy of Sciences of the United States of America*, 115(28), E6418–E6427.

[PD2] Rose, N. S., LaRocque, J. J., Riggall, A. C., Gosseries, O., Starrett, M. J., Meyering, E. E., & Postle, B. R. (2016). Reactivation of latent working memories with transcranial magnetic stimulation. *Science*, 354(6316), 1136–1139.

Spadone, S., Della Penna, S., Sestieri, C., Betti, V., Tosoni, A., Perrucci, M. G., ... Corbetta, M. (2015). Dynamic reorganization of human resting-state networks during visuospatial attention. *Proceedings of the National Academy of Sciences of the United States of America*, 112(26), 8112–8117.

Evaluation Details

Term Tests

Although the emphasis will be on material covered during lectures, the term tests may contain any material from the class lectures, textbook, or the assigned articles. As the lectures will always cover some information not contained in the texts (and vice versa), it is important that you both attend the lectures and do the readings. The term tests are non-cumulative. That is, the questions are grounded in the material covered in the preceding three lectures. However, some questions will require integration of material covered across the course, so don't forget what you've learned! Term tests will be completed on Quercus. Tests will be timed (i.e., you will have 2.5 hours to complete them) but you will have flexibility as to when during a 48-hour period you will begin them. This flexibility is in order to accommodate students in a variety of different time zones. *There is no final exam during the Final Examination Period for this course.*

Term Test Hotlines

Typically, I will not respond to online communication outside of normal business hours (see Course Policies, Online Communication). One exception to this policy will be to answer last-minute questions the night before each term test. I will be available to respond to student questions posted to the Term Test Hotline Discussion Boards

on our Course Website between 8pm and 10pm. These Discussion Boards will be open for posts the whole day prior to and all the way up until the start of the test. Students are welcome to post outside the 8-10pm hotline hours and are encouraged to answer each others' questions up until the test starts. *However, I will only be responding to questions between the hours of 8-10pm the night before the test.* I will answer questions as quickly as possible, in the order they were asked. Note that depending on the number of questions posted, there is a chance I will not get to your question.

Reading Quizzes

Quizzes will consist of a few questions that are based on the assigned readings for that day's class. You may reference the readings and any notes during the quiz, but Quizzes are timed at 15 minutes. For this reason, quizzes will be *much* easier for those students who have read the material before beginning. Your highest 7/8 quiz grades will comprise a total of 7% of your course grade. This means you may skip up to one quiz for any reason without an impact on your mark. There is a sample quiz (optional; does not count toward your grade) on the readings for the first lecture; see the Week 1 Quercus Module.

MRI Neuroanatomy

Students will use MRI data to make a mini brain atlas that identifies some key brain structures. Find more details on the Quercus Assignment page.

Paper Discussions

Twice throughout the term you will read an article and discuss it in your small group. The outcome of this discussion will be a short written assignment, which you will submit individually but should be informed by your group discussion.

- Step 1 – Draft responses: You will individually read the paper and write a draft of your responses to the questions (see Quercus assignment page). These will be marked for completion, within reason. You do not need to worry about writing full sentences, etc. for this; the goal is for you to think critically about the assigned paper on your own, and make notes to yourself so you can contribute to the group discussion. If your responses indicate you have read the paper and thought critically about it, you will receive full points for this step.
- Step 2 – Discuss with your group: Bring your draft responses (as well as any questions you might have) to your group and discuss. All group members need to participate in the discussion. Be sure that you use this time to clear up any confusion you have about the paper. You should allocate about 1 hour for this if you are participating synchronously.
- Step 3 – Refine your responses: Submit an updated version of the assignment on Quercus that has your refined responses, refined to take into account what you learned during your group discussion. The content of your assignments across group members may be similar, but you must write your own (individual) responses. In addition, your responses do not *have* to reflect the thoughts of your group members (e.g., if your group did not reach consensus or you have a different opinion). This assignment will be marked for both quality of content and writing style; this is a formal writing (though short) assignment and you should use complete sentences.

Term Paper & Peer Review

The writing assignment is an 8-10 page research paper in which you explore a controversy in cognitive neuroscience. Find more details on the Quercus Assignment page.

Students should submit a **complete draft** of their term paper via Quercus by the draft deadline noted in the course overview table. Late draft submissions will receive no credit, but students who fail to submit a draft paper will not be assigned a peer review. All students who have submitted a draft will be assigned one paper authored by an anonymous classmate to peer review. **Peer reviews** are to be submitted one week in advance of the final paper deadline to allow your classmate time to revise their paper in response to the feedback you provide. Late peer review submissions will receive no credit. Students should submit the **final version** of their paper via Quercus by the final term paper deadline noted in the course overview table.

Course Policies

University's Plagiarism Detection Tool (Original)

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>).

Quercus, including expectations for students to check

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. The site is dynamic and 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, even daily, basis. To access the course website, go to the U of T Quercus log-in page at <https://q.utoronto.ca>. Once you have logged in to Quercus using your UTORid and password, you should see the link or 'card' for PSY493 Cognitive Neuroscience. You may need to scroll through other cards to find this. Click on the PSY493 Cognitive Neuroscience link to open our course area, view the latest announcements and access your course resources. There are Quercus help guides for students that you can access by clicking on the '?' icon in the left side column. 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 ROSI 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.

Lecture Slides & Recordings

Any lecture slides and/or recordings will be posted no later than Monday of each week. *It is recommended that you allocate dedicated time for lecture viewing each week so you can stay on top of your work for this class.* Please consider the environment before printing your lecture slides. You might opt to take notes digitally instead of on print-outs or print double-sided.

Open Q&A Sessions

For at least the month of January 2022 and as long as our course is online, we will have live “Open Q&A” sessions to supplement the asynchronous lecture recordings. These sessions will be used to address student questions/requests submitted to an Open Q&A survey in the week prior to the test(s). For students unable to attend at the designated time, this session will be recorded.

Notice of video recording and sharing

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. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor. For questions about recording and use of videos in which you appear please contact your instructor.

Online Communication

Emails to the instructor and/or TA are *ONLY* for genuine emergencies (e.g., illness). Please do *not* use the build-in communication tool on Quercus, called “Inbox,” for this purpose. Neither the instructor nor teaching assistant will be able to respond to emails regarding course content; see below for information on how to ask your questions. You must use your utoronto email address for all course-related communication, and it is expected that you will check your utoronto email account regularly. For questions that arise outside of class, I will make every effort to respond to questions posted to the discussion board within one business day and/or during the next Open Q&A session. With the exception of the Term Test Hotlines, I will *not* respond to questions on evenings, holidays, or weekends, so plan ahead!

Missed Term Tests

All tests will be online and will be available for a period of 48h. Tests will be timed, but students may begin the test at a time that is convenient for them within the specified window. I expect students to make every effort to take required tests. *There will be no make-up tests.* If you are unable to write a test and you have a legitimate excuse, your marking scheme will be reweighted entirely at the instructor’s discretion. Contact me as soon as you are aware of the conflict and (ideally) before the day of the test to determine the best course of action. I must receive any documentation within one calendar week of the test. An unexcused missed test will receive a mark of zero.

Missed Reading Quizzes

I will drop the lowest grade of the reading quizzes, such that only 7 of the 8 reading quizzes count towards your grade. This means you can miss one quiz for any reason without it adversely impacting your grade. Documentation is required for reweighting beyond the first missed quiz.

Late Assignments

See the table above for assignment due dates. Except in the case of a documented emergency (see above), late Term Paper (final) and MRI Neuroanatomy Homework, and Paper Discussion assignments will be marked down 10% of the assignment grade per day. Late Reading Quizzes, Term Paper Drafts, and Peer Reviews are not accepted and will receive a mark of zero.

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 backgrounds, cultural traditions, and spiritual beliefs. 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 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.

Students with Disabilities or Accommodation Requirements

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 <http://www.studentlife.utoronto.ca/as/new-registration>. 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.

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 medical documentation in support of your specific medical circumstances. You may use the absence self-declaration tool on ACORN (please email me a PDF copy) or the usual VOI form. For more information, please see <http://www.illnessverification.utoronto.ca>. 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. 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.

Harassment and Discrimination

The University of Toronto is a richly diverse community and as such 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 actions or 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.

Re-Marking

All requests for re-marking must be submitted *in writing* within two* calendar weeks of the first day the marked test or assignment is available for student viewing. Only requests that include adequate written justification of an oversight in the original grading will be considered. Be as specific as possible. A legitimate request will result in the entire test or assignment being re-graded. Note that in agreeing to

resubmit your work for remarking, you are agreeing to a re-evaluation of the entirety of your work; your grade may go up, go down, or stay the same. If there has been an error in our arithmetic, please let us know and we will immediately recalculate your grade (no written request necessary). The work will first be re-marked by the original grader (usually the TA); if the student's concern is not satisfied, they can appeal to the instructor. *Negotiations for extra marks once final grades are in will not be tolerated. Arbitrary requests for grade increases will not be entertained (e.g., "I need to get into grad school, so could you please change my grade from a B+ to an A-?"). If I did this for one person, I would need to do it for everyone in the class. Please do not ask for special treatment – it is unfair to your classmates.*

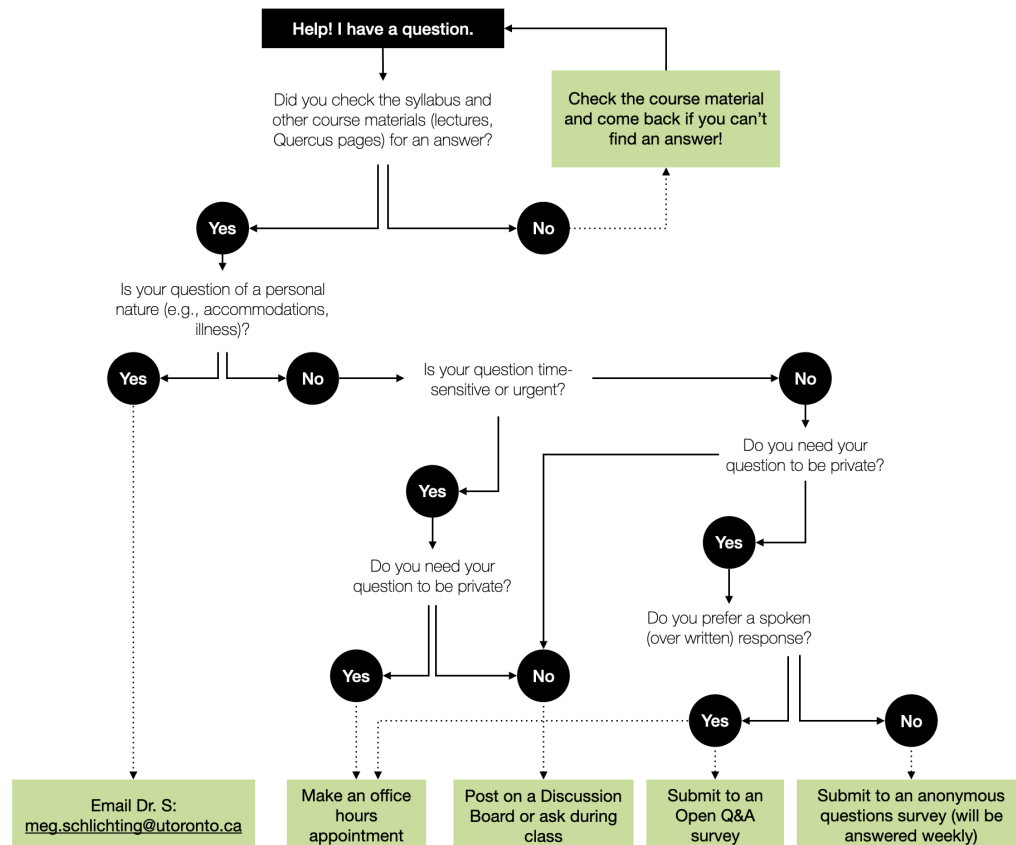
**Edited on Jan 26, 2022 to be two weeks rather than one week.*

Course materials, including lecture notes

Course materials are provided for the exclusive use of enrolled students. Do not share them with others. I do not want to discover that a student has put any of my materials into the public domain, has sold my materials, or has given my materials to a person or company that is using them to earn money. The University will support me in asserting and pursuing my rights, and my copyrights, in such matters.

Have a question?

See following flow chart for information on how to best ask your question. Please only ask your questions *after* you have double-checked the syllabus and Quercus pages for the answer to your question. I will make every effort to respond to questions posted to the Discussion board within one business day; however, questions posted to the anonymous weekly survey may take longer (up to one week). With the exception of the Term Test Hotlines, I will *not* respond to questions on evenings, holidays, or weekends, so plan ahead!



Additional Resources

Mental health and well-being

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. All of us benefit from support and guidance during times of struggle; there is no shame in needing help or in asking for help. There are many helpful resources available through your college Registrar or through Student Life (studentlife.utoronto.ca and 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 and do not hesitate to seek assistance from your Teaching Assistant or from me to help learn what supports are available.

Academic Integrity

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments and collaborating with fellow students. Ensure that all work you submit represents your own honest efforts. Plagiarism—representing someone else's work as your own or submitting work that you have previously submitted for marks in another class or program—is a serious offence that can result in sanctions. The following are *examples* of offences:

- Using someone else's ideas or words in one's own work without acknowledging in a citation that those ideas/words are not one's own.
- Including false, misleading or concocted citations in one's work.
- Obtaining unauthorized assistance on any assignment or to provide unauthorized assistance to another student.
- Using or possessing an unauthorized aid in any test or exam.
- Submitting work for credit in more than one course without permission of the instructor.
- Falsifying or altering any documentation required by the University (e.g., doctors' notes).

Speak to me for advice on anything that you find unclear. 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 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 artsci.utoronto.ca/osai and academicintegrity.utoronto.ca.

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 improve their writing, including one-on-one appointments with writing instructors, free workshops, and English Language Support. For more information on campus writing centres and activities, please visit writing.utoronto.ca.