

NROD60H3: Current Topics in Neuroscience

Physiology of Learning and Memory

University of Toronto Scarborough, Fall 2024 edition

Tuesday 15h00 – 17h00 EST

Highland Hall B110

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COURSE DESCRIPTION

Our experiences not only determine who we are, but also who we will become. The brain is a repository of past experiences, a driver of behaviour, and a powerful predictor. As a predictor, the brain evolved to maximize our survival by compiling our experiences in an ordered fashion across time, and using this catalogue of events, it guides future behavior. This process is known as learning and memory. A defining feature of an episodic memory is that it occurred in a specific place. Yet, ‘place’ is an abstract concept, so it does not exist in the physical world. We will learn how the brain creates spatial representations, or cognitive maps, that serve as a stage for our memories. We will also explore how the brain encodes a diversity of social, fear, and habit memories. We will focus on research that uses *in vivo* recording methods in animal models during memory tasks, which will provide an understanding of the dynamic relationship between neural activity and behaviour.

COURSE OBJECTIVES

Understand how specialized neurons in the hippocampal formation generate spatial representations, or cognitive maps, that are the essential building-blocks of an episodic memory

Become familiar with widely used *in vivo* recording (electrophysiology and calcium imaging) and manipulation (optogenetics and chemogenetics) techniques in neuroscience

Understand how *in vivo* neural activity across multiple brain regions interact to support learning, strengthening, and retrieval of a diversity of memory types

Become adept at searching for primary research articles and critically analyzing the scientific narrative of the authors to determine if the experiments support their conclusions

Improve scientific communication skills through group presentations, reviewing grant proposals, and writing an original grant on the physiology of learning and memory

Confidently engage in productive classroom discourse by listening to others, formulating ideas that build upon previous comments, and sharing a perspective that propels the discussion narrative forward

Hone intellectual self-defense skills so that the endless amount of information confronted daily, both inside and outside the classroom, is interpreted using a critical lens

WORKLOAD AS PERCENTAGE OF FINAL GRADE

1. Foundation presentation:	5%	
2. Article presentation:	30%	(25% article; 5% discussion)
3. Participation:	15%	(3% classroom; 12% Perusall)
4. Grant proposal:	35%	(10% experimental plan; 25% final)
5. Peer review of grant proposal:	15%	

WORKLOAD DETAILS

1. Foundation group presentation (5%): 17 September in class

During the semester we will cover eight topic/subfields within the broad field of learning and memory. To familiarize ourselves with these eight topics, groups of 3 students will provide a 12 to 15 minute presentation to introduce the class to a subfield. Group members will share the same grade. I encourage group members to decide how they will communicate with each other and distribute the responsibilities equally. As the group prepares their presentation, be respectful of your group members by giving everyone a voice and including them in the process. The presentation should emphasize the findings of the assigned Foundation paper, but also provide a general background on the topic. Each topic has an associated review paper that will be a helpful resource. Note, you do not need to specifically present the review paper, but it will be a useful tool to understand the history, theory, and methods of the subfield.

You should begin by establishing how this topic is related to theories of learning and memory. What are the central hypotheses in the subfield? Explain how this subfield has used, or can be enriched by, *in vivo* neurophysiology? Then, explain the figures of the foundation paper. Provide a summary/conclusion of the results. The goal of this presentation is to provide you will a low-stakes opportunity to build confidence speaking in front of the class prior to your Article Presentation. The presentation will be assessed on: presentation and organization of content, accurate presentation of facts, adequate subfield background, clarity of explanation of the Foundation paper, adherence to time limit, scientific narrative that combines the subfield with the foundation paper. On the first day of class I will provide the class with their group assignments.

2. Article presentation (total 30%): Various due dates

Each week, a research topic in a subfield of physiology of learning and memory will be presented by a group of students. The class period will consist of two parts: (1) individual student presentations on their research article and (2) a group-led discussion that explores the subfield. Group members will share the same grade for the discussion portion of the presentation, but each group member will receive an individual grade for the research article they present. Grading rubrics are on Quercus.

Once the presentation group is set, I encourage group members to decide how they will communicate with each other and distribute the responsibilities equally for the class discussion segment. As the group prepares their presentation, be respectful of your group members by giving everyone a voice and including them in the process. It is highly encouraged to discuss your plans with me during office hours 1-2 weeks prior to presentation. If irreconcilable differences arise during presentation preparation, contact me as soon as possible prior the presentation.

Article selection (0%): 05 September at 11:59PM EST

I will provide an overview of each topic and the PDFs of articles are located on Persuall. Review the papers and visit the interactive document on Quercus in the Pages section called “Sign-up for Presentation Article”. Select your article by typing your name in the “student” column. Groups will be generated organically as a function of article sign-up. Articles are selected on a first-come, first-served, basis. If you do not select an article before the deadline, one will be assigned to you.

Article (25%): Articles should be presented in a slide presentation lasting 20-25 minutes. For the day, you are meant to be the expert on this paper. You should know the article front-to-back, as though you performed the research yourself. Your peers may ask questions during your talk, be prepared to answer. Remember, there was the Foundation presentation and your peers annotated your article in Perusall. A highly detailed presentation of the article is not required. Rather, your presentation should address the following:

(i) Motivation: Explain what the scientists viewed as an interesting and unsolved phenomenon? What is their hypothesis and how does it fit into the theory of this subfield? What knowledge gap will they fill?

(ii) Results: Your goal here is to question the assumptions and conclusions of the researchers. You are required to carefully and critically examine the evidence. There are the results and there are the author’s conclusions; are the conclusions justified? Explain how the results confirm, or not, the author’s overall hypothesis. For each main figure you should: (a) describe the question that motivated the experiments that were performed. Most papers have a research narrative wherein the figures build upon each other, explain that to your peers. (b) briefly, what techniques were used? What analysis methods were applied to address the question? (c) when considering all of the figure’s panels, what was the final message of the figure? What is the narrative of the paper?

Note, it is **insufficient to simply repeat** the author’s figure conclusion. You must link the components of the figure to the figure conclusion. Tell us how the authors were allowed to make that conclusion. One helpful tip I can provide comes from screenplay writing. In effective films or series are marred by an “and then” narrative link. The most effective narrative uses “but; therefore” to link ideas. The same is true with research articles, they are narratives and the scientists were motivated to show you all the figure panels for “but” and “therefore” reasons, not “and then” reasons. So when I instruct you to share the results of the paper, you are meant to share the “but” and “therefore” narrative links between the experiments/figures. Here is a [Reddit Thread](#).

(iii) Limitations: Every paper has valuable information and limitations. You have already laid the groundwork for this in the *Results*. Consider the following questions: Is there a disconnect between the dependent measures and what the authors claim they are measuring? Were all effects convincing? Are the paper’s conclusions truly supported by the data? Did the experiments create a logical research narrative? How could the paper be improved? Criticism is cheap; to have meaningful discourse, if you identify a limitation, explain why it is a limitation and provide a solution. Lastly, stating that a study is limited because it was not performed in humans is rather obvious and should be avoided.

(iv) Perspectives: What was amazing about this paper? Did it change the way you think about the brain? Consider your paper and its relation to the associated Foundation paper. Do the results conflict with existing findings? Did the paper develop new techniques, behaviours, theories, etc.? You will have to dig into the literature to address these questions, often the discussion section of the article will be helpful. What follow-up experiments do the findings inspire? You may want to reserve a few minutes for peer questions.

You will be assessed on understanding of the motivation / hypotheses, methods, clear explanation of results, critical analysis of the limitations, perspective on paper's impact, presentation & organization of content, and adherence to time limit.

Pro tips: In the Files on Quercus, I uploaded a PDF "How to read a scientific article" that may be helpful. You should start preparing about 2 weeks prior to your presentation. Get to know your article! Use the Read Aloud function and listen to your article as you walk to class or ride TTC. Once familiar with the article, annotate it. Then translate every paragraph into simplified non-jargony summary using your own words. Now, look at the figures, assess how the results of the figures fit into the non-technical translation of the article you made. Write the conclusions of the figures in your own words. Important (again), given the results, explain why the authors were permitted to make their conclusions. Finally, when preparing your presentation, look at Perusall (details below) to see what your peers are struggling to understand and integrate this information in your slides.

Discussion (5%): After the Article presentations, the group will lead a class discussion lasting 10-15 minutes. The group is granted the liberty to structure the Discussion as they see fit. It can be as simple as preparing some prompts to ask students, dividing students into groups to debate merits and limitations of articles, etc. The task is to engage the class to discuss the topic at a high intellectual level that critically examines the article's findings and interpretations. Do the figures in the articles all agree? Can you synthesize a take-home message or theory? What are the implications of that message or theory? Remember, your classmates will have annotated these articles, so they should be prepared to discuss at a high-level. The Discussion section will be assessed on: presentation and organization of content, critical analysis of the article's implications for the subfield and beyond, ability to field questions, adherence to time limit, and engagement of your classmates.

To ensure there are no technical delays, please submit your slide presentation files to me via email prior to the start of class.

3. Participation (total 15%): Every class & each Tuesday by 09:00AM EST on Perusall

Classroom (3%): As a seminar course, the objective is to discuss everyone's questions, needs for clarification, criticisms, and perspectives on research articles. Since research articles are composed of several figures that build upon one another to create a narrative, it is critical to have a clear understanding from the outset, otherwise you will quickly be lost. Even if you believe your question to be obvious or unsophisticated, ask it. To generate a situation where curiosity conspires with theory to create interesting speculations and plausible scientific ideas, it is essential to maintain a professional and courteous demeanor during class. Although we will create a safe space for discussion, it does not mean that we cannot disagree with each other. Remember, what drives an interesting discussion is a common thread that considers and integrates previous comments. Whether or not you agree with your classmates, listen to them, build upon their comments, consider how you can link your idea to your peer's ideas.

To discuss the articles, you must attend class. An excellent participation grade reflects weekly comments and questions that demonstrate critical evaluation of course material and original thinking. The best strategy to ensure active participation is to read the assigned articles and come to class prepared to discuss. If you are not comfortable speaking in class, please contact me and we can discuss alternatives.

Perusall (12%): To encourage reading of the assigned articles before class, students will be required to annotate articles using Perusall. This software provides an interactive platform for classmates to virtually interact in the context of the assigned readings. Each week the class will be assigned the articles of that

week's topic. You must read the articles on the Persuall app. For each of the assigned articles, you will be required to provide at least four annotations per article. Annotations can take the form of questions that you post or answering a question from an existing conversation thread.

Not all annotations are created equal, so I have provided guide in the Files section of Quercus called "General Thoughts on Perusall Annotations" that demonstrates how annotations will be assessed. Moreover, the first Persuall "assignment" is not evaluated, but will help guide your use of Perusall. We are using this software because primary research articles are dense, and this platform provides a virtual space for classmates to collectively work through challenging topics, techniques, and experiments. Students will be split into 4 or 6 article annotation groups on Perusall. Within the Library section of Perusall you will find the foundation and review articles associated with the weekly topic. You are not required to annotate the articles associated with your presentation topic. All annotations are due each week on **Tuesday by 09:00AM EST**.

To access our class Perusall use this [link](#). Sign up for an account and follow the account confirmation directions. Once confirmed, enter the course code: ROZESKE-FZ8DZ . Perusall contains several functions that you will not be required to use for class, but might find useful (e.g., private notetaking for articles). This [link](#) provides the step-by-step process for account setup and use.

4. Grant Proposal (total 35%): Various due dates

Grants are the bread and butter of scientists. Mention the word "grant" to any research professor and they will tell you that they recently submitted one or are currently writing one. Scientists are perpetually writing grants because research is expensive and securing funding is a highly competitive process. The ability to write a clear, exciting, and compelling grant is a scientist's most valuable skill. For this assignment you will write a grant that follows the format of the Natural Sciences and Engineering Research Council of Canada (NSERC). This federal agency awards research funds for five-year projects via the [Discovery Grant funding mechanism](#). With millions of taxpayer dollars at stake, grant proposals are reviewed by a panel of three researchers in your general field of study. Your goal is to convince them that your exciting new experiments will fill a knowledge gap in the field. To convince your reader, you must communicate the following throughout various sections of your grant:

1. What is your research question and why is it significant?
 - a. Explain what you are interested in studying and the hypotheses or predictions that stem from your question. Why spend money to study it?
 - b. To develop a fundable grant, you must walk the line between an over-the-top almost impossible hypothesis that would radically change how we think about the brain and a so-overly-obvious hypothesis that it is practically already in textbooks and there is nothing further that is exciting to explore.
2. What is the theory or prediction in the subfield, and where are the knowledge gaps?
 - a. Connect your research question to theories in your field. Where do existing theories fall short? Will your hypothesis disprove a central prediction from a theory in the field? Will it confirm a theory in the field?
 - b. You are solving a puzzle that is either going to confirm a theory's prediction or break a theory and establish a new one. Your job is to provide an adequate background so that your reader clearly understands where there are gaps in scientific knowledge.
3. What is your approach to address the knowledge gaps?

- a. You will propose three specific aims that contain multiple experiments to address the knowledge gaps. A major aspect of writing a successful grant is to propose an exciting set of experiments that specifically, and perhaps cleverly, address the knowledge gap.
 - b. Explain the methodology you will use to fill the knowledge gap (e.g. record 1000s of hippocampal parvalbumin interneurons in a mouse with *in vivo* calcium imaging during zero-gravity maze task on a SpaceX flight).
 - c. Prediction how the experiments will turn out, why do you think they will turn out that way? Citing existing theories and literature is solid way to support predictions.
 - d. Pre-emptively anticipate questions or criticisms of the reviewers by explaining the data analysis strategy, how experimental results will be interpreted, and additional strategies if technical issues arise (so-called *caveats* or *pitfalls*).
4. How will the results of your experiments fill the knowledge gaps and push the field forward?
- a. Describe the impact and the big-picture implications. Research is not an island; link your potential results with existing publications and explain how it will advance knowledge.

Your grant must investigate a question in the field of neurophysiology of learning and memory. Imagine you have access to all the techniques and resources that we discussed during this course. The goal is to synthesize what you have learned about *in vivo* recording and manipulations of neural circuits to write an original grant. Although the grant is reviewed by neuroscientists, it is unlikely they are specialists in your subfield. This means your reader is informed but may not use the same research techniques as you (e.g., neurophysiology of hippocampal somatostatin interneurons during fear behaviour compared to the expression of proinflammatory cytokine mRNA in the hippocampus after stress). Your task is to articulate your ideas to an informed population of scientists with a clear and simple narrative.

Pro tips: I provide a guide in the Files section of Quercus called “General Thoughts on Grant Writing Structure” for in-depth details. Choose a topic that you are interested in, you will spend a lot of time researching that topic as you write your grant. To ensure your grant is novel, find a recently published paper on the topic that you are interested in, and develop ideas that build off that article.

This assignment is divided into stages to provide you with feedback to improve your grant.

Experimental plan (10%): due 11 October by 11:59PM EST

This assignment will help you develop your hypothesis and experiment ideas. When writing a grant you should consider: What is the prevailing theory in the subfield? How does your hypothesis relate to the subfield’s theory? What is your rationale for suggesting this hypothesis? Remember, hypotheses are only useful if they generate clear, testable predictions.

Begin by writing a paragraph that provides the reader with sufficient background to place your hypothesis within a theoretical background. This paragraph is an on-ramp to understand why you will perform the experiments that you will propose. You will then write out the experiments of your grant. Experiments in grants are centered around three specific aims; the aims serve to outline three broad goals of the grant. You must explicitly write out three specific aims designed to test the grant’s overarching hypothesis. For each aim, describe in a few sentences the experiments you are planning: experimental and control groups, recording method, neural manipulation method, behavioural task, etc. For each aim, you are required to proposed at least 2 experiments. I will provide feedback on your experiments. Submit your Word file on the Quercus assignment “Grant Proposal: Experimental plan”. The maximum allowed length is 8000 characters (with spaces). If it is over the length limit, you will receive a 10% reduction. Late submissions are accepted, but with a 10% reduction penalty for every day late.

Grant proposal for peer review (0%): due 14 November by 11:59PM EST

Your grant proposal must adhere to the following formatting guidelines. The length must be between 8 and 8.25 double-spaced pages, this excludes the reference section. In Word, use Times New Roman font size 11 with 2.54 cm (1”) margins. Inclusion of a figure/diagram is prohibited without my consent; in the case of inclusion, the text length requirement must be met in the absence of your figure/diagram. As per the NSERC guidelines website, your submission must have the following sections:

Project title: One short and descriptive sentence that communicates the substance of your proposal.

Overview: Here you provide the background and rationale that is motivating the entire grant. This is like an abstract in a research paper and is the first section your referees will read. It should be clear, exciting, and compelling. In one to two paragraphs summarize your grant in lay terms and broadly describe the methods and deliverables of your specific aims. This section contains five references.

Objectives: Begin by writing a paragraph that provides the reader with an abbreviated, but sufficient background, to understand why you will perform these specific aims. Then list the aims one by one. Each aim should be one sentence long and succinctly capture the goal of that aim. After listing the aims, write a paragraph that describes the valuable information that will come from completion of these aims. Also describe the big-picture implications of these aims and how their completion fits into your long-term goals as a researcher. Finally, describe what completion of these aims will provide to the research community. The “Experimental Plan” assignment will guide you. This section contains five references.

Literature review: As your reader may not be in the same subfield as you, this section should provide them with enough background to understand the theory, brain regions, cell types, techniques, etc. that are directly relevant to your specific aims. This section should highlight how your specific aims relate to the most recent publications in the field. Remember, in a grant you are making the case that funding your proposal will create breakthroughs that push the boundaries of current knowledge. This section should be one to one-and-a-half pages long and include at least 10 references that are not review papers.

Methodology: This section is organized by specific aim and for each aim there are separate sub-sections of rationale, experimental approach, and feasibility. For rationale, explain why you chose these particular experiments and methods. For experimental approach explain your experimental and data analysis approach with enough detail that your reviewer understands the methods and the control/experimental groups. For feasibility, describe potential pitfalls or data interpretation issues, and your strategy to address them if they arise. Please refer to the grant writing guide provided in Quercus for more details.

Impact: In this section you make the final case why your proposal should be funded. Emphasize the novelty of the experimental approach and how the results will change the trajectory of your research field and advance theories in the natural sciences. It is also appropriate to discuss how anticipated results will inform clinical practice(s) and potentially lead to novel therapeutics or medical devices.

References: In text citations must follow the formatting style used by the journals Nature or Science (for an example, refer to an assigned paper published in one of these journals). A reference manager is highly encouraged because it will save you time and make your life easier. Reference managers organize all your citations within your text and insert a formatted and chronological bibliography at the end of the document. There are two free reference managers. One is Mendeley, which seamlessly integrates into Word. The other is Paperpile, which can be used with Google Docs. Paperpile requires one additional step of converting your Google Doc to a Word file before submitting your final grant proposal.

The nearly finalized draft will be submitted on Quercus assignment “Grant proposal: Proposal for peer review”. As this is a double-blind anonymous review process, do not write your name or identifying information on your grant proposal. You will not receive a grade for this version of your grant, but a more polished version of your grant will receive more valuable feedback from your peer. If you do not submit your draft by the due date, I will use your Experimental Plan assignment and you will receive a 10% reduction applied to your final grant submission.

Final grant proposal (25%): due 02 December by 11:59PM EST

After receiving anonymous feedback from your peer, integrate their comments as you see fit and finalize the grant proposal for submission to me. The final grant proposal will be submitted through Quercus assignment “Grant Proposal: Final Version” and assessed by Turnitin. The grading rubric is available on Quercus. Late submissions will be accepted, but with a 10% reduction penalty for every day late.

Grants will be assessed by adherence to length and formatting guidelines, depth of background described in the literature review, novelty of hypothesis and specific aims, understanding of the methods proposed, grasp of the theoretical implications of the results, appropriate/accurate references, and clarity of writing. In a grant, the merit of the scientific idea is as important as the clarity in which you describe it. If your writing is poor and incoherent, your reader will not be able to grasp your brilliant idea.

5. Grant Proposal peer review (15%): due 21 November by 11:59PM EST

Before a grant is submitted to a private or federal granting agency it has been pored over by several scientists and is ultimately a product of a team effort. In the same spirit, each student will be assigned a peer’s grant to review, which will advance the clarity and rigor of the proposal. The peer review process will be double-blind and administered on Quercus. In the Quercus assignment “Grant Proposal: Proposal for peer review” you will find on the right-hand side a link to the proposal you will review (a tutorial can be viewed [here](#). **Do not annotate** the grant proposal on Quercus; the grant review you write will be given to your peer in a separate document (details below). Your review will follow the model used by several granting agencies that requires the referees to include:

Summary: In two to three paragraphs, provide your understanding of the author’s experimental rationale, hypothesis, objectives, methodology, and impact. Here you legitimize that you understood the grant.

Strengths & Weaknesses: In two separate sections, provide feedback on which aspects of the grant were the most compelling and the aspects that could be improved. In the Strengths section, comment on what you found to be the highlights of the grant. It could be the solid theoretical grounding, thorough literature review, clever/interesting experimental methods, and/or data analysis strategy. In the Weaknesses section, provide constructive suggestions for how the proposal can be improved. Ask yourself, “Do the proposed experiments specifically address a knowledge gap in the field? Am I excited about this grant? Are the techniques used appropriately?” Your comments for improvement could range from adding missing control groups, adopting a different behavioural task, recording from a more specific neuronal subtype, using a different neural perturbation method, etc. As you craft your peer review, remember the hours of work that you sunk into your own grant proposal; provide honest criticism, but take care to be constructive in your tone. Your goal is to guide the writer on how they can elevate their grant to perfection, not to crush their spirit.

Submission guidelines: The length of the peer review should be 2.75 to 3 double-spaced pages. In Word, use Times New Roman font size 11 with 2.54 cm (1”) margins. Include the title of the grant proposal in

the header section of your peer review. Submit your review on Quercus assignment “Peer Review: Peer review of grant proposal” and Turnitin. Late submissions will be penalized 10% per day. A grading rubric is on Quercus. Importantly, the anonymous feedback you receive from your peer on your grant will not factor into the overall grade that you receive for your grant proposal. You have the liberty to either include your peer’s feedback, or not.

COURSE SCHEDULE

WEEK	DATE	TOPIC	READINGS
01	03 SEP	Course introduction	Syllabus
	05 SEP	Due	Sign up for Article presentation
02	10 SEP	The hippocampus in memory and space I	Milner et al 1998; Lisman et al 2017
03	17 SEP	Foundation article presentations	Your assigned foundation paper and review
04	24 SEP	The hippocampus in memory and space II	Colgin et al 2008; Fenton et al 2024 (optional)
05	01 OCT	Hippocampal replay	Wilson et al 1994; de Lavilleon et al 2015; Fernandez-Ruiz et al 2019; Roux et al 2017; Rev: Joo et al 2018
06	08 OCT	Ventral hippocampus	Nadel 1968; Ciochi et al 2015; Padilla et al 2019; Jimenez et al 2020; Rev: Dong et al. 2010
	11 OCT	Due	Experimental plan
07	15 OCT	Social memory	Maaswinkel et al 1996; Scribner et al 2020; Oliva et al 2020; Robson et al 2024; Rev: Piskorowski et al 2018
08	22 OCT	Fear memory	Phillips et al 1992; Herry et al 2008; Diehl et al 2018; Krabbe et al 2019; Rev: Duvarci et al 2014
		Reading Week 28 OCT to 01 NOV	NO CLASS
09	05 NOV	Memory allocation	Guzowski et al 1999; Ramirez et al 2013; Mocle et al 2024; Tanaka et al 2018; Rev: Josselyn et al 2020
10	12 NOV	Systems consolidation	Frankland et al 2004; Goshen et al 2011; Kitamura et al 2017; Refaeli et al 2023; Rev: Takehara 2020
	14 NOV	Due	Grant proposal for peer review
11	19 NOV	Hippocampal dopamine	Gasbarri et al 1996; McNamara et al 2014; Takeuchi et al 2016; Krishnan et al 2022; Rev: Duzkiewicz et al. 2019
	21 NOV	Due	Peer review of grant proposal
12	26 NOV	Striatal learning	Packard et al 1996; Gage et al 2010; Crego et al 2020; Burton et al 2017; Rev: Berke 2018
	02 DEC	Due	Final grant proposal

COURSE MATERIALS

The weekly topic will have 1 review article, 1 foundational paper, and 3 recent research papers. Often, the recent research papers will have a supplementary file in addition to the main article. All materials are available in Persuall. Students are expected to read the 3 research articles and come to class prepared to

discuss. Evidence that you read the assigned articles is determined by in class participation and Perusall activity (see *Participation* for details).

COURSE POLICIES

Email: All correspondence should be sent from a UofT email address to the instructor's email address listed on the first page of the syllabus. Please use professional email etiquette as outlined in the document "General Thoughts on Email Etiquette" that is available in the Files folder on Quercus. Messages sent through Quercus Messages will not be answered. If you do not receive a response within 48 hours it is likely the answer to your question is in the syllabus or Quercus Announcements.

Video and audio recording: No part of the classes may be recorded, unless you are granted specific permission by the instructor as part of an accommodation through Accessibility Services. This prohibition stems from reasons of privacy as well as protection of copyright. This is outlined in the Provost's guidelines on *Appropriate Use of Information and Communication Technology*.

Copyright of lecture material: As protection of copyright, unauthorized copying, use, or uploading onto the internet of any of the lecture slides, handouts, or course materials produced by Professor Rozeske is strictly prohibited.

Contesting a grade: Re-grade requests will only be considered within two weeks of the grade being received. These will only be considered if adequate written justification is provided by the student. If granted, re-grading will consist of re-evaluation of the complete assignment, potentially leading to a grade increase, no change, or decrease. Requests without a solid rationale will not be considered (e.g. I need a higher grade to apply to med or grad school).

Classroom conduct: The University is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities. Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person or online. Professional courtesy, respectful language, and sensitivity will help to create a welcoming and safe learning environment for everyone. Students are expected to be attentively engaged during lectures and resist the temptation to use their mobile device or laptop to engage in non-course related activities.

Attendance: As a seminar course, your attendance is required to participate in class. There are no virtual options available for attendance or presentations. Additionally, please be punctual. Understandably, in certain circumstances tardiness cannot be avoided, but please be on time. Habitual tardiness demonstrates a lack of respect for the entire class as it disrupts the flow of a presentation. As the adage goes, "to be early is to be on time, to be on time is to be late". Lastly, you are expected to bring the required readings (digital or hard copy) to class. If you are unable to attend class, refer to the Psychology Department Missed Term Work Policy outlined in this syllabus. An unexcused absence will result in a 0% for class participation that day.

Office hours: Students are encouraged to attend office hours to discuss the course content, their grant proposal, their presentation, etc. Students are also welcomed to attend office hours if they would like guidance on how they can become involved in neuroscience beyond the classroom. Contact me to book an appointment if the scheduled office hours are incompatible with your schedule.

Syllabus modifications: The instructor reserves the right to make minor changes to the syllabus. These changes will be communicated to the class via Quercus Announcements. Most often alterations to the syllabus will be related to sequencing and articles discussed.

GRADING SCALE & DEFINITIONS

PERCENT	LETTER	VALUE	GRADE DEFINITION
90-100	A+	4.0	<i>Excellent:</i> Strong evidence of original thinking, good organization; capacity to analyze and synthesize; superior grasp of subject matter with sound critical evaluations; evidence of extensive knowledge base.
85-89	A	4.0	<i>Excellent</i>
80-84	A-	3.7	<i>Excellent</i>
77-79	B+	3.3	<i>Good:</i> Evidence of grasp of subject matter; some evidence of critical capacity and analytic ability; reasonable understanding of relevant issues; evidence of familiarity with literature
73-76	B	3.0	<i>Good</i>
70-72	B-	2.7	<i>Good</i>
67-69	C+	2.3	<i>Adequate:</i> Student who is profiting from the university experience; understanding of the subject matter and ability to develop solutions to simple problems in the material.
63-66	C	2.0	<i>Adequate</i>
60-62	C-	1.7	<i>Adequate</i>
57-59	D+	1.3	<i>Marginal:</i> Some evidence of familiarity with the subject matter and some evidence that critical and analytic skills have been developed.
53-56	D	1.0	<i>Marginal</i>
50-52	D-	0.7	<i>Marginal</i>
0-49	F	0.0	<i>Inadequate:</i> Little evidence of even superficial understanding of subject matter; weakness in critical & analytical skills; limited or irrelevant use of literature.

ACADEMIC INTEGRITY

Academic integrity is essential to the pursuit of learning and scholarship, and to ensure that a degree from the University of Toronto is a strong signal of a student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The [University of Toronto's Code of Behaviour on Academic Matters](#) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.

Potential offences in papers and assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment. On tests and exams, cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If students have questions about what constitutes appropriate academic behaviour or appropriate research and citation methods, they are expected to seek out additional information on academic integrity from their instructors or from other institutional resources.

Note: You may see advertisements for services offering grammar help, essay editing and proof-reading. Be very careful. If these services take a draft of your work and significantly change the content and/or language, you may be committing an academic offence (unauthorized assistance) under the *Code of Behaviour on Academic Matters*.

It is safer to take your draft to the Writing Centre whose services can be accessed through the [Centre for Teaching and Learning](#). They will give you guidance that you can trust. Students for whom English is not their first language should go to the English Language Development Centre also available at the Centre for Teaching and Learning. If you decide to use these services in spite of this caution, you **must keep a draft** of your work and any notes you made before you got help and be **prepared to give it to your instructor** upon request.

USE OF GENERATIVE ARTIFICIAL INTELLIGENCE TOOLS

The use of generative artificial intelligence tools and apps is strictly prohibited in all course assignments unless explicitly stated otherwise by the course instructor. This includes ChatGPT, GPT4, and other AI writing and coding assistants. Use of generative AI in this course may be considered use of an unauthorized aid, which is a form of cheating. This course policy is designed to promote your learning and intellectual development. Use of generative artificial intelligence tools will prevent the fulfilment of a central course objective, the synthesis of original ideas into a compelling written research report. The instructor reserves **the right to request a draft of your work** and any notes you made throughout your writing processing.

UNIVERSITY'S 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](#).

EQUITY, DIVERSITY, INCLUSION

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.

UNIVERSITY LAND ACKNOWLEDGEMENT

I wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit.

Today, this meeting place is still home to many indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

ACCOMMODATIONS

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, contact [Accessibility Services Office](#) as soon as possible. Accessibility Services staff (located in Rm AA142, Arts & Administration Building) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. Please contact 416-287-7560 (tel/TTY) or email ability.uts@utoronto.ca for more information.

DEPARTMENT OF PSYCHOLOGY MISSED TERM WORK POLICY

For missed term work due to illness, emergency, or other mitigating circumstances, please follow the procedure outlined below.

Procedure:

1. Complete the [Request for Missed Term Work Accommodations Form](#) ("MTW Form").
2. Email **BOTH** your MTW Form and Supporting Documentation to the **course instructor** according to the instructions specified below.

Supporting Documentation Requirements and Deadlines:

Reason for Missed Work	Documentation required for a first absence in the term	Documentation required for subsequent absences in the term or for absence during scheduled presentation day	Deadline for submitting MTW form and supporting documentation
Illness or Injury	ACORN Absence Declaration	UofT Verification of Illness Form	<u>WITHIN 2 BUSINESS DAYS</u> of the missed work
Bereavement	ACORN Absence Declaration	A death certificate or funeral announcement	<u>WITHIN 2 BUSINESS DAYS</u> of the missed work
University-sponsored athletic or artistic obligation at the varsity/provincial/national level	ACORN Absence Declaration	A note from a university staff member (advisor, coach, residence staff, etc.) who can substantiate the obligation, sent directly to the course email	<u>10 BUSINESS DAYS IN ADVANCE</u> of the missed deadline
Disability-related reasons for students registered with AccessAbility Services	For missed TERM TESTS , <ul style="list-style-type: none"> - Contact your AccessAbility consultant and have them write to the course email detailing the accommodations needed. For missed ASSIGNMENTS , <ul style="list-style-type: none"> - If your desired accommodation is within the scope of your Accommodation Letter (e.g. your letter includes "extensions of up to 7 		<u>PREFERABLY IN ADVANCE OF THE MISSED WORK, OR AS SOON AS POSSIBLE</u>

	<p>days” and you need 3 days), send your Accommodation Letter to the course email and specify how many days extension you are requesting.</p> <ul style="list-style-type: none"> - If your desired accommodation is outside the scope of your Accommodation Letter (e.g. your letter includes “extensions of up to 7 days” but you need more time than that), contact your AccessAbility consultant and have them write to the course email detailing the accommodations needed. 	
Academic Conflict (e.g. two midterms at the same time)	Screenshot from Quercus demonstrating the conflict.	10 BUSINESS DAYS IN ADVANCE of the missed work
Religious Conflict	None required	

Notes:

- The following reasons are not considered sufficient for missed term work: social activities, recreational travel, technological issues, avoidance of assessments or deadlines, work commitments
- [Missed Final Exams](#) are handled by the Registrar’s Office and should be declared on eService.
- For ACORN absence declarations, the date you declare the absence is required to fall within the seven-day declaration period (i.e.) the absence cannot be submitted proactively or retroactively.
- Instructors cannot accept term work any later than five business days after the last day of class. Beyond this date, accommodations are only possible via the Registrar’s Office [petition process](#).
- If you are unable to submit your request within the specified number of business days, you must still email your instructor within that window to explain the nature of the delay. Exceptions to the deadlines are made only under exceptional circumstances.
- Multiple assignments due on the same day are not considered academic conflicts. Students are expected to manage their time effectively to meet assignment deadlines.
- Back-to-back tests/quizzes are not considered academic conflicts. Only overlapping activities are conflicts.
- Students are responsible for keeping their course timetables conflict-free. Students who register in two courses with overlapping lecture/tutorial/lab schedules will not be accommodated.

Next Steps:

After submitting your documentation, you will receive a response from your instructor or TA. The course instructor reserves the right to decide what accommodations will be made. Failure to adhere to any aspect of this policy may result in a denial of your request. **You are responsible for checking your official U of T email and Quercus course announcements daily**, as accommodations may be time-critical.

For missed assignments, **do not wait for the instructor’s response to resume work on your assignment**. Extensions may be as short as one business day, depending on the nature of the illness/emergency. Complete your assignment as soon as you’re able, and email it to your instructor.

If an accommodation is granted but a continued illness/emergency prevents you from meeting its requirements, you must repeat the missed term work procedure to request additional accommodations.

Please make it clear in your subject line that you are requesting a second accommodation.

Examples: If you were granted an extension for a paper but are still unable to meet the new deadline, or if you miss a make-up term test, you must submit *another* MTW form and supply documentation according to the “subsequent absences” column in the chart above. *Note: In the case of a missed make-up test, an opportunity to write a second make-up test may not necessarily be provided.