

THE UNIVERSITY OF TORONTO SCARBOROUGH Neuroscience Program

NROD98: Thesis in Neuroscience, Fall 2021/Winter 2022

1.0 CALENDAR DESCRIPTION

This course offers the opportunity to engage in a year long research project under the supervision of an interested member of the faculty in Neuroscience. The project will culminate in a written report in the form of a thesis and a poster presentation. During the course of the year, at appropriate times, students will meet to present their own research proposals, to appraise the proposals of others, and to discuss the results of their investigation. Students must first find a supervisor, which is usually confirmed before the start of the academic term in which the project will be initiated. Students will meet as a group with the coordinator as well as individually with their supervisor. Preference in this course is given to Specialists in Neuroscience with a cumulative GPA of 3.3 or higher. Students planning to pursue graduate studies are especially encouraged to enrol in the course. Students must obtain a permission form from the Department of Psychology's website that is to be completed and signed by the intended supervisor, and submitted to the Psychology Office. At that time, the student will be provided with an outline of the schedule and general requirements for the course. Students seeking supervision off campus will need to arrange co supervision with a faculty member in Neuroscience at UTSC.

2.0 COURSE INFORMATION

Prerequisite: Satisfactory completion of 15.0 credits in any discipline, including [PSYB07H3] or STAB22H3] and [0.5 credit in a laboratory course from Psychology, Biology or Neuroscience] and consent of a faculty member in Psychology or Biology to serve as a research supervisor. Note: Preference will be given to students in a Specialist program in Neuroscience whose 15.0 credits include [PSYC08H3] or PSYC09H3] and who have a cGPA of at least 3.3.

Exclusion: BIOD98Y3, PSYD98Y3, (BGYD98Y3), (BGYD99Y3), (BGYD01Y3), (BGYD02Y3)

Class meeting time: Wednesdays from 3 pm – 5 pm (Online – Synchronous)

3.0 INSTRUCTOR CONTACT INFORMATION

Instructor: Professor Jonathan Cant (email: <u>jonathan.cant@utoronto.ca;</u> please put NROD98 in the subject line of any emails)

Virtual office hours: Thursdays between 12 pm - 2 pm (online via Zoom), or by appointment; A Zoom link will be provided by 11 am each Thursday morning; I will admit students from the waiting room and meet with them individually in turn; thus, there may be some wait time!

4.0 ONLINE COURSE RESOURCES

Quercus: https://q.utoronto.ca/

Quercus will be used as the main online resource for this course. All important course-related information (e.g. lecture slides, announcements, syllabus, class schedule, assignment information, message boards, grades, etc.) will be available via Quercus.

Zoom: Zoom links for each class will be posted as an announcement in Quercus by noon the day of a scheduled class. Please create a Zoom account prior to the first class by clicking on the following link and following the instructions https://act.utoronto.ca/zoom-information/

5.0 OBJECTIVES AND LEARNING OUTCOMES

The purpose of this course is to provide students pursuing a specialist degree in Neuroscience with an intensive research apprenticeship. The course is designed to achieve the following *Learning Outcomes:*

- 1. Students will develop a research question that identifies a gap in the existing literature, and that is informed by a current review of the published literature in the relevant area of research.
- 2. In collaboration with their faculty supervisor, students will design an experiment and implement the necessary procedures to conduct the research and complete the data collection, while always adhering to approved ethical standards in data collection.
- 3. Students will analyze their data using appropriate statistical techniques, and interpret their data based on the outcome of those analyses.
- 4. Students will become proficient in distinguishing between types of research articles, conducting a literature search using specialized databases, and using a citation management system.
- 5. Students will develop critical writing skills, including how to review a piece of literature for quality and pertinence, and then synthesize, paraphrase, and evaluate to produce a coherent piece of writing.
- 6. By the end of the course, students will have written a thesis that includes a review of the relevant literature, a clearly articulated research question and statement of rationale, a clearly articulated set of hypotheses, a detailed description of materials and methods, a plan for data analysis, a description of results, and a discussion of results within the framework of the published literature.
- 7. Students will develop oral presentation skills and have opportunities to practice them.
- 8. Students will become trained in research ethics for conducting research with both human and non-human animal subjects.

6.0 CLASS SCHEDULE

Note: I will be posting lecture slides by noon the day of a scheduled class.

Fall 2021:

Date	Topic	Items Due
September 8	 Introduction and overview 	
September 15	No class scheduled	Research survey due by 11:59 pm
September 22	 Research workshop (with Sarah Guay, Librarian, UTSC) 	
September 29	 Applying for graduate school 	
October 6	CV/resume writing workshop (with Prof. Kyle Danielson)	
October 11 – 15	READING WEEK, NO CLASS	
October 20	No class scheduled	
October 27	 Ethics in science and the peer review process Giving effective oral presentations 	 Form documenting ethics meeting with supervisor due by 3 pm TCPS 2 certificate due by 3 pm Ethics in animal research certificate due by 3 pm Thesis proposal due by 3 pm
November 3	No class scheduled	
November 10	Oral presentations	
November 17	Oral presentations	
November 24	Oral Presentations	
December 1	 Oral Presentations 	

Winter 2022:

Date	Topic	Items Due
January 12	No class scheduled	
January 19	Writing workshop	
January 26	No class scheduled	
February 2	No class scheduled	
February 9	Peer review session	 Draft introduction and methods due by 3 pm
February 16	No class scheduled	
February 22 – 25	READING WEEK, NO CLASS	
March 2	No class scheduled	
March 9	Poster workshop	
March 16	No class scheduled	
March 23	Writing support drop in	
March 30	No class scheduled	
April 6	Writing support drop in	
April 11 (tentative)		 Thesis paper due; Thesis poster due; Thesis Day

7.0 EVALUATION

Supervisor grade: 60% Second reader grade: 15%

Class grade: 25%

The breakdown of your evaluation for the class component is as follows:

1. Attendance and participation in scheduled meetings: 10%

2. Ethics requirement: 8%3. Research proposal: 10%

4. Draft introduction and methods: 12%

5. Oral presentation: 30%6. Poster presentation: 30%

1. Attendance/participation

All classes this year will be held on Zoom, with synchronous delivery (to create an account, please go to the following link and follow the instructions: https://act.utoronto.ca/zoom-information/). The class will not meet every week during the year. For scheduled classes, however, attendance is mandatory (except where indicated). Attendance will be taken at each meeting, and information about your contributions to the class will be available to your supervisors. The opportunity during class for students to develop public speaking skills and to engage in discussion about research with peers is an important part of the overall research experience. Students must attend at least 50% of classes to receive any of this portion of this component of the grade (e.g., you will get a grade out of 10 proportionate to the number of classes you attended). A student may miss one class without penalty; however, any additional missed classes will be reflected in the final assessment of this component of the evaluation.

2. Ethics

All research in the University that involves living animals, human or non-human, must be approved by the appropriate ethics review board before the research can begin. There are 3 components to the ethics assignment for this course, and all students, regardless of whether they are doing human or animal research, are expected to complete each component. The 8% that comprises this component of the evaluation is all-or-nothing; ALL components must be completed by October 27 to achieve the 8%. That said, as part of the completion of the course requirements, ALL students must as a minimum complete the form that documents their meeting with their supervisor (item 'a' below), and the component of the ethics training corresponding to the type of research they are doing (human or laboratory animal; item 'b' or 'c' below):

a. Meeting with supervisor to determine ethics requirements; submission of form documenting meeting (available on Quercus under the "Ethics Materials" module; Upload to Quercus by class-time October 27. All students must consult with their supervisor first thing in the term to determine what review procedures have been followed for their projects and whether additional review proceedings are required before the work can be carried out. Many students will need to submit an "Undergraduate Ethics Review Protocol Form - Student-Initiated Projects" for approval by the Psychology "Delegated Ethics Review Committee" (DERC). The protocol form is available at http://www.utsc.utoronto.ca/psych/experiential-learning. Please speak with me, Ainsley Lawson, and/or your supervisor about the procedures for submitting

these protocols for review. Ultimately, it is the responsibility of your supervisor to ensure that your projects have met the necessary ethics review requirements; however, it is an important part of your education to know and understand what those requirements are. For this reason, you are asked to have a conversation with your supervisor about the ethics requirement for your particular project as early in the term as possible (form documenting meeting due October 27). Please discuss with your supervisor what, if any, special considerations apply to the approval of ethics for your project due to COVID-19, and whether these will affect your timeline for data collection.

- b. Completing Introductory Tutorial for the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2); **Upload to Quercus by class-time October 27**. All students are required to complete this tutorial online (https://ethics.gc.ca/eng/education_tutorial-didacticiel.html), and obtain a certificate of completion to submit to Prof Cant (i.e., upload via Quercus) on October 27. If you already have a certificate of completion, dated within the past two years, you may submit this certificate and be exempt from repeating the course.
- c. Training in Ethical Research with Animals; **Upload to Quercus by class-time October 27**. All students, regardless of whether they are working with live animals this year or not, must complete the University of Toronto's Division of Comparative Medicine short course on ethics in animal research. The course comprises its own Quercus page, to which all thesis students will be invited in mid-September. The course must be completed in its entirety by the deadline of October 27 (If you have already completed the course, within the past two years, you just need to upload proof of completion to Quercus and are exempt from repeating the course).

3. Proposal

You will submit a brief (300-500 word) proposal/plan for your research project, **uploaded to Quercus by October 27, 3 pm**. This proposal should include: a clear rationale for the research, a research question, hypotheses, and a brief description of the methodology. You should construct this short proposal in collaboration with your research supervisor. This proposal will be graded on a 4-point scale: 1 = unsatisfactory (incomplete, poor development and writing); 2 = satisfactory (complete, poor development or writing); 3 = good (complete, development and writing meet expectations); 4 = excellent (complete, development and writing exceed expectations), with decimal values possible (e.g., 3.7, 4.1, etc.).

4. First draft of Introduction and Methods

Please **upload to Quercus by class-time** *February 9,* a well-developed first draft of your introduction and methods; also, please have a copy available during class-time to work with in a peer-review exercise during class time. This draft will be graded on a 4-point scale: 1 = unsatisfactory (incomplete, poor development and writing); 2 = satisfactory (complete, poor development or writing); 3 = good (complete, development and writing meet expectations); 4 = excellent (complete, development and writing exceed expectations), with decimal values possible (e.g., 3.7, 4.1, etc.).

5. Oral Presentation

Students will give a 20-25 min oral presentation of their thesis project, followed by a 5-10 min discussion period. Presentations must include a well-developed background of current literature in the relevant research area that provides a sound rationale for the research question under study. A clear statement of the research question and hypotheses must be

provided, as well as detailed description of the methodology, research design, and data analysis techniques. Because presentations are scheduled for relatively early in the year, it is not expected that most students will have data to present. If, however, a student has preliminary results that they wish to share, they may do so. In all cases, a discussion and interpretation of anticipated (or obtained) results, within the context of the published literature, must be provided. Tips on giving effective oral presentations will be provided in class on Oct 27, and presentations are scheduled for November 10, 17, 24, and December 1. You will find out the specific date your presentation is scheduled for well in advance of this date.

A grading rubric for the presentations will be provided by Oct 27.

6. Poster Presentation

A poster conference is planned for early April, either in-person, or virtual, depending on the status of the COVID-19 pandemic. This session will provide a valuable opportunity to present your final work and receive feedback from professors and peers. More details about poster content and layout will be provided in class on **March 9**. Below are preparation guidelines for your poster e-presentations.

Poster e-presentations (if necessary)

To give you a chance to disseminate your research findings and present your poster, you will be asked to record a short video presentation of your electronic poster to be judged by faculty or graduate students in the Psychology and Neuroscience programs. These are the same individuals who would judge your poster presentation on Thesis Day in person. The presentation will take the form of a **screen recording on your computer**. You are not required to record your face while speaking. Instead, you will simply record what is on your computer screen while narrating. Technical details are below.

In your presentation:

- You should provide a description of your study's background, methods, findings, and interpretation of the results, much as you would do during a live poster session.
- While speaking, you should point out specific areas of your poster, much as you would do during a live poster session.
- You should highlight any future directions or methodological limitations to your work.
- More details about how to make an effective poster presentation can be discussed with your thesis course instructor and/or thesis supervisor.

Technical details:

- Your video presentation should last **no more than five minutes**. Please be respectful of the judges' time and do not exceed this time limit.
- To complete your video, you should use screen capture software that simultaneously records what is shown on your screen and your voice. There is no need to use your webcam to record your face.
- While recording, your poster should be in **full screen mode** to ensure maximal visibility.
- The University of Toronto subscribes to TechSmith Snagit, software that allows you to record your screen and voice simultaneously. **This software is the best tool for this project**. Information about downloading and licensing Snagit can be found here: https://g.utoronto.ca/courses/46670/pages/lecture-capture/
- Once the video is completed, you may edit its length using Snagit or another video editing tool. You should then save the video and upload it to the University's MyMedia site

(https://mymedia.library.utoronto.ca/login). There it will be converted to a link that you can submit on Quercus for the judges. Please do not attempt to upload the actual video file to Quercus.

FINAL THESIS SUBMISSION

Students are required to submit their final thesis by **Monday April 11 (tentatively)**. Further instructions for submitting documents will be provided later in the year. Late submissions will be subject to a penalty of 10% per day.

Important Dates

September 15: Research survey due by 11:59 pm

October 27: Form documenting ethics meeting with supervisor due by 3 pm

TCPS 2 certificate due by 3 pm

Ethics in animal research certificate due by 3 pm

Thesis proposal due by 3 pm

November 10: Oral presentations November 17: Oral presentations November 24: Oral presentations December 1: Oral presentations

February 9: Draft introduction and methods due by 3 pm

April 11: Thesis paper due

Thesis poster due

Thesis day

<u>Policy on late assignments:</u> late assignments will lose 10% for each day past the deadline that they are not submitted. Extensions will only be granted with proper documentation (i.e., documented family emergency, and/or missed term work accommodations form). Please note, according to UTSC policy, I am not permitted to extend the deadline for any assignment beyond 5 days past the last day of classes for the year (April 8).

Psychology Department Missed Term Work Policy, FALL 2021

For missed term work (assignments and term tests) due to illness, emergency, or other mitigating circumstances, please follow the procedures outlined below.

- The following reasons are not considered sufficient for missed term work: travel for leisure, weddings, personal commitments, work commitments, human error.
- Missed Final Exams are handled by the Registrar's Office and should be declared on eService: http://www.utsc.utoronto.ca/registrar/missing-examination
- Instructors cannot accept term work any later than five business days after the last day
 of class. Beyond this date, you would need to file a petition with the Registrar's Office:
 https://www.utsc.utoronto.ca/registrar/term-work

Accommodations for Illness or Emergency:

For missed work due to ILLNESS OR EMERGENCY, complete the following **three-step** process:

- Complete the Request for Missed Term Work Accommodations Form (http://uoft.me/PSY-MTW)
- 2. Declare your absence on <u>ACORN</u> (Profile & Settings > Absence Declaration)
- Email both the Request for Missed Term Work Accommodations Form <u>AND</u> a screenshot of your Self-Declared Absence on <u>ACORN</u> to <u>jonathan.cant@utoronto.ca</u> <u>within 2 business days</u> of the missed work.

<u>Note:</u> If you are unable to submit your documents within 2-business days, **you must still email your instructor within the 2-business day window** to explain the nature of the delay, and when you will be able to provide your documents. Exceptions to the documentation deadline will only be made under **exceptional circumstances**.

<u>Note:</u> For this semester, we do not require any additional supporting documentation (e.g. medical notes) to support your missed term work accommodation request.

Accommodations for Academic Conflicts:

For missed term work due to an ACADEMIC CONFLICT (i.e. two midterms scheduled at the same time), please complete the following process:

- Complete the Request for Missed Term Work Accommodations Form (http://uoft.me/PSY-MTW), choosing "Other" and explaining the conflict in the space provided.
- 2. Take screenshots of your course homepages that demonstrate the conflict.
- 3. Email the form and screenshots to <u>jonathan.cant@utoronto.ca</u> at least two weeks (10 business days) before the date of the activity, or as soon as possible if it was not possible to identify the conflict earlier.

<u>Note:</u> Multiple assignments due on the same day are <u>not</u> considered conflicts.

Accommodations may only be possible in the case of quizzes and tests that are both scheduled during the same discrete period. Back-to-back tests/quizzes are <u>not</u> considered conflicts.

<u>Note:</u> Students are responsible for keeping their course timetables conflict-free. Students who choose to register in two synchronous courses with overlapping lecture/tutorial/lab schedules may not necessarily be accommodated.

Accommodations for Religious Conflicts:

For missed term work due to a RELIGIOUS CONFLICT, please complete the following process:

 Complete the Request for Missed Term Work Accommodations Form (http://uoft.me/PSY-MTW), choosing "Other" and noting "Religious conflict" in the space provided. 2. Email the form to jonathan.cant@utoronto.ca at least two weeks (10 business days) before the date of the activity, or as soon as possible if it was not possible to identify the conflict earlier.

Accommodations for Time Zone Conflicts:

If you are physically in a different time zone and a quiz or midterm is scheduled outside of 7:00am to midnight in your local time, please complete the following process:

- 1. Complete the Time Zone Conflict Form (https://uoft.me/PSY-TimeZone), and
- 2. Email the form to jonathan.cant@utoronto.ca at least two weeks (10 business days) before the date of the activity, or as soon as possible, if it was not possible to identify the conflict earlier.

<u>Accommodations for Students Registered with AccessAbility Services:</u>

For missed **TERM TESTS** due to ACCESSABILITY REASONS:

 Contact your AccessAbility consultant and have them email jonathan.cant@utoronto.ca detailing accommodations required.

For missed ASSIGNMENTS due to ACCESSABILITY REASONS:

- If your desired accommodation is within the scope of your Accommodation Letter (e.g. your letter includes "extensions of up to 7 days" and you need 3 days):
 - 1. Complete the Request for Missed Term Work Accommodations Form.
 - Email the form and your Accommodation Letter to jonathan.cant@utoronto.ca, specifying how many days extension you are requesting.
- 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 email jonathan.cant@utoronto.ca detailing the accommodations required.

Accommodation Procedure:

After submitting your documentation, you will receive a response from your instructor or TA. This form does not guarantee that you will be accommodated. The course instructor reserves the right to decide what accommodations (if any) will be made. Failure to adhere to any aspect of this policy may result in a denial of your request for accommodation. 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 an instructor response to resume work on your assignment. Extension accommodations may be as short as one business day, depending on

the nature of the illness/emergency. You should complete your assignment as soon as you are able and email it your instructor.

For an anticipated event (e.g. scheduled surgery or an illness with a prolonged recovery period), submit a <u>Verification of Illness Form</u> completed by your doctor, AND this form to your instructor if you would like to request accommodations in advance of the assignment deadline or midterm date. **Declare your future absence on <u>ACORN</u>** (absences can be declared up to 14 days in the future).

Missed Accommodations

If an accommodation is granted but a continued illness/emergency prevents you from meeting the requirements of your accommodation, you must <u>repeat</u> the missed term work procedure to request additional accommodations. **Please make it clear in your subject line that you are requesting a second accommodation.** For example, if you are given an extension but are still sick and need more time, or if you miss a <u>make-up</u> midterm, you must submit another request 'Missed Term Work Accommodations' form and declare your extended absence on ACORN. ***Note: In the case of a missed make-up test, an opportunity to write a second make-up test may not be provided.

NOTE: Assignments due at end of term

Instructors cannot accept term work any later than five business days after the last day of class. Beyond this date, you would need to file a petition with the Registrar's Office (https://www.utsc.utoronto.ca/registrar/term-work).

NOTE: Final Exams

This policy applies only to missed assignments and term tests. Missed final exams are handled by the Registrar's Office (http://www.utsc.utoronto.ca/registrar/missing-examination).

Policy on Missed Final Examinations: students are expected to write the final examination. If a student fails to write the final examination, they may petition the Registrar's office for permission to write a deferred exam, but note that the Registrar's office only grants these petitions under conditions of illness or extreme emergency at the time of the examination (see http://www.utsc.utoronto.ca/registrar/deferred-exams for more details). Thus, you must ensure that you have proper documentation to support your petition (e.g., documented family emergency, or UTSC medical certificate). Students who fail to provide proper documentation for missing the final exam will receive a mark of 0% on that exam.

8.0 ADDITIONAL INFORMATION

Help With Writing

If you would like help with academic writing, the following resources are available to you:

- The Centre for Teaching and Learning (AC312) Writing Centre offers students one-to-one appointments and supplementary materials to help improve upon their writing skills. http://ctl.utsc.utoronto.ca/home/ http://ctl.utsc.utoronto.ca/twc/
- The English Language Development Centre offers support and specialized writing programs for students who do not speak English as their primary language. http://ctl.utsc.utoronto.ca/eld/
- Advice on academic writing http://www.writing.utoronto.ca/advice

Academic Integrity

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun011995.pdf) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In papers and assignments:

- 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:

- Using or possessing unauthorized aids;
- Looking at someone else's answers during an exam or test;
- Misrepresenting your identity; and
- When you knew or ought to have known you were doing it.

In academic work:

- Falsifying institutional documents or grades;
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes; and
- When you knew or ought to have known you were doing so.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If students have questions or concerns 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 much better and safer to take your draft to the Writing Centre as early as you can. They will give you guidance you can trust. Students for whom English is not their first language should go to the English Language Development Centre.

If you decide to use these services in spite of this caution, you <u>must</u> keep a draft of your work and any notes you made before you got help and <u>be prepared to give it to your instructor on</u> request.

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)

Access Ability Services

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, please feel free to approach me and/or the AccessAbility Services as soon as possible.

AccessAbility Services staff (located in Rm SW302, Science Wing) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email ability@utsc.utoronto.ca. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Literature Searches

Students can use the following resources when conducting literature searches to find relevant articles for their presentation and final essay:

The UTSC Library (AC235) http://www.library.utoronto.ca/utsc/

PubMed

http://www.ncbi.nlm.nih.gov/pubmed

PsychINFO

http://www.apa.org/pubs/databases/psycinfo/index.aspx

Google Scholar http://scholar.google.ca/

For Your Health

The Health and Wellness Centre (SL270, 416-287-7065) provides diagnostic, treatment and referral services for all illnesses ranging from the medical to psychological to health promotion. The professional staff of physicians, nurses and counselors provides personal advice and assistance with family issues, eating disorders, depression, stress, drug and alcohol abuse, relationship issues, a positive space for gender/sexuality issues, and more. http://www.utsc.utoronto.ca/wellness