

# Neuroanatomy Laboratory Syllabus (tentative)

NROB60H3 Fall 2020

Professor: Dr. Janelle LeBoutillier

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Virtual Office Hours: Wednesday 1:30 to 2:30 by appointment

Course E-mail: nrob60.utsc@gmail.com

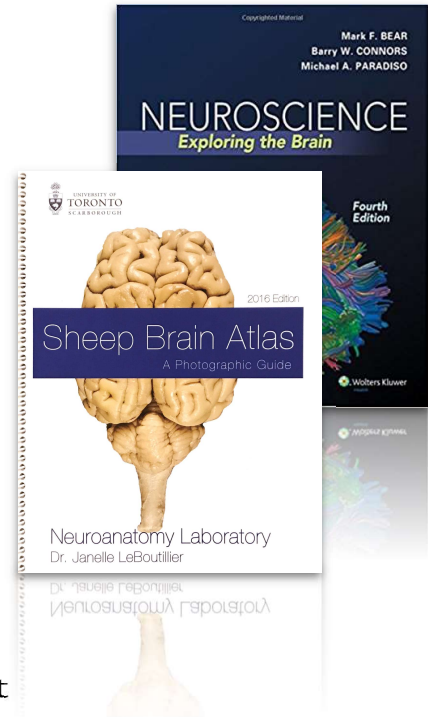
This is the only email account that will be monitored for the course.  
Times indicated for labs, tests & office hours are in Toronto time (ET).

Textbook: Neuroscience: Exploring the Brain. 4th edition by Bear, Connors and Paradiso. We will be covering the first 7 chapters and the appendix in this text. Several options are available to purchase the text (e.g., you may purchase only the required chapter readings, an electronic version of the entire text or a hard copy of the text through the bookstore).

Lab book: Sheep Brain Atlas: A Photographic Guide, 2016 edition  
A pdf version will be posted to Quercus  
Students can order a print copy of the atlas from [www.uoftbookstore.com](http://www.uoftbookstore.com), under the course NROB60

Course Material: Quercus (<https://q.utoronto.ca/>)

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



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

Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation, and are protected by copyright. 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.

**Lectures:** Every attempt will be made to have recordings available weekly on Blackboard collaborate by Tues evening each week. Lectures will remain online until the end of term. Some lectures will be live while others may be pre-recorded. Live lectures will be held Tues 12-2 on BB collaborate. You can view available recordings by clicking the three lines on the top left of BB collaborate

**Labs:** Live each week Wed 12-1 on BB collaborate. It is very important that you keep up with the weekly labs. If you are unable to attend the weekly lab, you can view available recordings by clicking the three lines on the top left of BB collaborate.

#### Course Description:

Neuroscience is the scientific study of nervous systems. It is the study of the nature and functioning of the nervous system at all levels, from the molecules that make up individual nerve cells and the transfer of information from one nerve cell to another, to the complexities of how thoughts, emotions, and behaviours are produced.

Neuroscience is at the interface between biology and psychology. It is unique in that it makes use of a variety of methods and investigations from a wide range of traditional disciplines. To understand the nervous system and how it works requires knowledge of anatomy, molecular biology, biochemistry, pathology, physiology, pharmacology, psychology and zoology.

The lecture part of this course deals with the anatomy of the nervous system. In this component, you will learn about the anatomy of the brain, as well as the structure and function of the cells of the nervous system. You will also develop an understanding of how neurons communicate, with a focus on their physiological properties. We will examine specific brain regions which you will also identify in the lab component of this course and discuss their functions and connections.

Weekly lab sessions will cover gross and systems anatomy of the nervous system. Learning neuroanatomy is like learning both a new language and a map of a new world, so be patient, practice the nomenclature, and your hard work will be rewarded.

Altogether, this course lays the framework for understanding subsequent neuroscience courses. We will begin to understand how the activity of even small groups of neurons can lead to the activity of circuits specialized for all our sensations, movements, specific goal-directed behaviours, emotions, and ultimately, we hope, cognition.

### **Grading Scheme:**

Lecture Component – Total 45%

Midterm Exam (12%)

- TBA by Registrar's Office (50 minutes)
- Tests lecture material and textbook chapters 1, 2, 3, plus the content of chapter 7 + Appendix that has been covered in lecture to date.

Final Exam (33%)

- Held during final exam period (about 100 minutes); date TBA by Registrar's Office.
- Covers all lecture content and assigned textbook readings for the term.

Note: Lecture tests may include multiple choice, short answer, diagrams/labelling, and matching questions. All lecture tests will be conducted online with Quercus.

Lab Component – Total 55 %

Midterm Lab Test 1 PS1,2 and 3 (12%)

Midterm Lab Test 2 PS4 and 5 (12%)

Midterm Lab Test 3 PS6 (12%)

Final Lab Test All PS series (10%)

Assignment 1 (4%) Cranial nerves

Assignment 2 (5%) Anatomical Samples

Bonus Dissection Protocol Quizzes (up to 2%)

### **Course Schedule:**

LECTURE SCHEDULE:

WEEK	DATE	TOPIC	CHAPTER(S)
1	Sept 8	Course Introduction Neuroscience: Past, Present and Future	Ch 1
2	Sept 15	Structure of the Nervous System Gross Organization Anatomical References CNS/PNS Video NOTE THIS WILL BE TESTED ON THE FINAL LECTURE EXAM	Ch 7 (partial) and Appendix (partial)
3	Sept 22	Development of the Nervous System Meninges BBB & Ventricular system Cranial nerves	Ch 7 (partial) and Appendix (partial)
4	Sept 29	Cortical Function & Brain Cells The prototypical neuron Glia	Ch 7 (partial) and Appendix (partial) Ch 2
5	Oct 6	Resting Membrane Potential	Ch 3
		Reading week Oct 10-16	
6	Week of Oct 19	Midterm Test Requested TBA by Registrar	
7	Oct 27	Action Potential	Ch 4
8	Nov 3	Principals of Synaptic Integration and Chemical Synaptic Transmission	Ch 5
9	Nov 10	Neurotransmitter Systems Cholinergic neurons Catecholamine neurons Dopaminergic neurons	Ch 6
10	Nov 17	Hippocampus	7 and Appendix

11	Nov 24	Cerebellum & Basal Ganglia	7 and Appendix
12	Dec 1	Tying it all Together	7 and Appendix

The midterm lecture test will include all assigned text readings and lecture material covered up to and including week 5. The time and date of the test will be assigned by the registrar.

The final exam will be cumulative on all content covered in the lecture component of the course unless specifically excluded.

#### LABORATORY COMPONENT:

The lab schedule will be discussed in the first week of labs which start the week of Sept 9 and an overview will be given in the first lecture.

The Sheep Brain Atlas: A Photographic Guide will be available online on Quercus for use in the course. (the 2016 edition of the atlas is required). Dissection lab videos are also posted to Quercus. Students may find the online sheep atlas helpful for preparing for tests. A demonstration of these tools will be given in the first lab.

#### Lab Schedule:

There will be 4 tests in the course, in week 4, 7, 10 and 11. The first test will cover content on Photoseries (PS) 1,2 and 3. The second test will cover content on PS 4 and 5. The third test will cover content on PS6. The final lab test is cumulative, testing the content of PS 1-6. You are responsible for knowing all neuroanatomical structures as presented in the Sheep Brain Atlas: A Photographic Guide, 2016 edition. Any updates will be provided as an announcement to the course home page or during the weekly lab sessions.

LAB DATE	TOPIC	PHOTOSERIES
Week 1: Sept 9	<ol style="list-style-type: none"> <li>1. Basic Terminology</li> <li>2. Accessing the on-line atlas</li> <li>3. Demo of lab test format</li> <li>4. Gross Anatomy</li> <li>5. Major sulci and gyri</li> <li>6. Testing your browser for quizzes and tests using the sample quiz link</li> </ol>	1
Week 2: Sept 16	<ol style="list-style-type: none"> <li>1. Ventral surface structures</li> <li>2. Cranial nerves and functions</li> </ol>	1 and 2

Week 3: Sept 23	1. Mid-sagittal sectioning 2. Identification of mid-sagittal structures	3
Week 4 Sept 30	Lab Test 1 on Quercus at noon Sept 30	1,2,3
Week 5: Oct 7	1. Dorsal and lateral dissections 2. Hippocampal dissection	4
	Reading week Oct 10-16	
Week 6: Oct 21	1. Identification of Horizontal structures	5
Week 7 Oct 28	Lab Test 2 on Quercus at noon Oct 28	4,5
Week 8: Nov 4	1. Rostral coronal sections 2. Caudal coronal sections	6a
Week 9: Nov 11	1. Cerebellar coronal sections	6b
Week 10: Nov 18	Lab Test 3 on Quercus at noon Nov 18	all of 6
Week 11: Nov 25	Final Lab Test on Quercus at noon Nov 25 Nov 25	All PS 1-6
Week 12: Dec 2	Check your lab mark on Quercus Ask questions about the lecture content	

### Lab Test Format

Your TA will provide a demonstration of the lab test format during the first lab. In brief, images of specimen samples will be set up with 1 neuroanatomical structure pinned per image/tray.

Test and quiz dates are all in this syllabus. Please take some time to enter these in your personal calendars so you don't miss anything. You are responsible for monitoring Quercus regularly for announcements. You are strongly encouraged to start all quizzes and tests on time.

- Lab test 1 will cover all content from PS 1, 2 and 3 will consist of 36 dissecting trays/images with 1 pin, each lasting 12 minutes.
- Lab test 2 will cover all content form PS4 and 5 and will consist of 36 dissecting trays/images with 1 pin each, lasting 12 minutes.
- Lab test 3 will cover all content form PS6 and will consist of 36 dissecting trays/images with 1 pin each, lasting 12 minutes.
- The final lab test will consist of 30 dissecting trays/images with 1 pin each and will be cumulative on all lab content (Photoseries 1-6). The test will be 10 minutes in length,

### Bonus Dissection Protocol Quizzes

Students can earn up to 2% in the course as follows:

A total of 6 quizzes will be given in the course with your best 4 counting. These will be based on the dissection protocols, dissection videos and photoseries for each lab, and will consist of 6 questions total and will take 2 minutes to complete. The purpose of these quizzes is to encourage you to keep up with lab content. There are no make-up quizzes and you are strongly encouraged to write all quizzes. Quizzes will be conducted at 10 am on the dates listed below through Quercus. In order to receive a 2 % bonus mark you must pass 4 of the 6 quizzes. Passing 3 quizzes will result in a bonus mark of 1.5% while passing 2 quizzes will result in a bonus mark of 1%. You will not receive any credit for passing fewer than 2 of the 6 quizzes.

Quiz 1 Content from Week 1 and 2 Wed Sept 16

Quiz 2 Content from Week 3 Wed Sept 23

Quiz 3 Content from Week 5 Wed Oct 7

Quiz 4 Content from Week 6 Wed Oct 21

Quiz 5 Content from Week 8 Wed Nov 4

Quiz 6 Content from Week 8 and 9 Wed Nov 11

You are responsible for testing your browser to ensure you have no technical challenges in completing tests and quizzes. We have posted a practice quiz for you to do this and it is important that this is done prior to the first quiz. We will discuss this at the first lab. Past experiences indicate that students found the Chrome browse to be the best one to use for uploading the images. If you have difficulties please check this link:

<https://www.vicestudents.utoronto.ca/covid-19/tech-requirements-online-learning/>

### Assignments:

Assignment 1. Cranial Nerve Assignment 4%

Each student shall prepare and submit to Quercus a test question on cranial nerves. You should assume that you are a clinician and an individual has presented to you with a nerve problem that you need to

diagnose based on the information discussed with you at their appointment. You may be as creative as you wish in designing your scenario but should include damage to 2 or 3 nerves in the answer.

A simple example... Your patient was away on a summer canoe trip and fell while on a portage. Upon recovery she noticed she had difficulty with her balance when walking. In addition, she continues to experience a brief but excruciating pain at the base of the tongue that radiates toward the neck. The pain is intermittent but often occurs after eating and swallowing. With these problems which nerves could contribute to these behavioural outcomes.

Answer: Vestibulocochlear and Glossopharyngeal nerves

Only the course instructor will be grading this assignment. For full credit on this assignment you must submit your first draft of the cranial nerve on time, provide feedback for your 2 peer-reviewed cranial nerve assignments and comment on the difficulty of each question by the due date, and submit a well written cranial nerve question through Turnitin by the due date. Be sure to review the details below before submitting your assignment.

1. Your cranial nerve assignment is due no later than Sept 30 at 9 am. Submit this on Quercus to the column labelled "Draft Cranial nerve". Reminder: **Do not include your answer at this time.**
2. On Sept 30 you will randomly be assigned 2 cranial nerve assignments to peer review. For each you should indicate the nerves involved, rate each question as to its difficulty and provide feedback to the author. If you found any part of the nerve question confusing this should be shared with the author. The feedback on your 2 nerve questions is due no later than Oct 7 at 9 am
3. Students should submit their final nerve question and answer through Turnitin on Quercus no later than Oct 21 at 9 am. Submit this to the column in the gradebook marked "Final Cranial Nerve". Students may elect to use or not use any of the feedback received by their peers to improve their final submission. Please read the details on Turnitin included on the home page if you are not familiar with this tool.

### **Turnitin:**

First, some background information on this program. Turnitin.com is a tool that assists in detecting textual similarities between compared works i.e.: it is an electronic resource that assists in the detection and deterrence of plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.

### Assignment 2 Functional Anatomy 5%

You will search the internet for suitable images of the sheep brain and prepare 5 sample trays which could be used for testing purposes. You should label these structures following the same guidelines we will use during all class quizzes and tests. Each image should have only 1 question and answer. Preparing these samples will help you study for your lab tests by examining different examples of sheep brain dissections. In selecting images for this assignment you should include cuts from different planes of section and across a range of difficulty from easy to hard. This assignment is due no later than Nov 11 at 9 am.

## **IMPORTANT INFORMATION FOR PSYCHOLOGY COURSES**

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## 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, you may use the following form to request special arrangements. Note that the form is only for term work. [Final exam conflicts](#) are handled by the Registrar's Office.

The form must be submitted **at least ten (10) business days before the activity**.

Form: <https://uoft.me/PSY-TimeZone>

**Submit via email to:** Keely Hicks, Departmental Assistant, [keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)

## Missed Term Work due to Medical Illness or Other Emergency

All students citing a documented reason for missed term work must submit their request for accommodations **within three (3) business days** of the deadline for the missed work.

**Submit via email to:** Keely Hicks, Departmental Assistant, [keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)

Students must submit **BOTH** of the following:

- (1.) A completed **Request for Missed Term Work Accommodations form** (<http://uoft.me/PSY-MTW>), and
- (2.) **Appropriate documentation** to verify your illness or emergency, as described below.

### **Appropriate documentation:**

For missed **ASSIGNMENTS** or **TERM TESTS** due to **FLU-LIKE SYMPTOMS** or **SELF-ISOLATION REQUIREMENTS**:

- Email the Request for Missed Term Work Accommodations form ([uoft.me/PSY-MTW](http://uoft.me/PSY-MTW)) to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), and
- **Declare** your absence on **ACORN** (Profile & Settings > Absence Declaration)

For missed **ASSIGNMENTS** due to **OTHER ILLNESS**:

- Email the Request for Missed Term Work Accommodations form ([uoft.me/PSY-MTW](http://uoft.me/PSY-MTW)) to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), along with the Self-Declaration of Student Illness Form ([uoft.me/PSY-self-declare-form](http://uoft.me/PSY-self-declare-form)).

For missed **TERM TESTS** due to **OTHER ILLNESS**:

- Email the Request for Missed Term Work Accommodations form ([uoft.me/PSY-MTW](http://uoft.me/PSY-MTW)) to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), along with a scan/photo of the **original** copy of the official UTSC Verification of Illness Form ([uoft.me/UTSC-Verification-Of-Illness-Form](http://uoft.me/UTSC-Verification-Of-Illness-Form)) or an **original** copy of the record of visitation to a hospital ER.
- Forms are to be completed in full, clearly indicating the start date, anticipated end date, and severity of illness. The physician's registration # and business stamp are required.
- *Note: If an end date of "ongoing" is specified, the medical note will be assumed to cover a period of **two weeks**. If no end date / an "unknown" end date is specified, the note will be assumed to cover a period of **three business days** (starting from illness start date.)*

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

- Meet with your **AccessAbility consultant** and have them email Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)) detailing accommodations required.

For missed **ASSIGNMENTS** due to **ACCESSABILITY REASONS**:

- If your desired accommodation is **within the scope** of your Accommodation Letter (ex. your letter includes “extensions of up to 7 days” and you need 1-7 more days), email the Request for Missed Term Work Accommodations form ([uoft.me/PSY-MTW](http://uoft.me/PSY-MTW)) to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), and attach a **copy of your letter**. Specify how many days extension you are requesting in your email.
- If your desired accommodation is **outside the scope** of your Accommodation Letter (ex. your letter includes “extensions of up to 7 days” but you need more time than that) you will need to meet with your **AccessAbility consultant** and have them email Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)) detailing the accommodations required.

For missed **ASSIGNMENTS** or **TERM TESTS** in **OTHER CIRCUMSTANCES**:

Email the Request for Missed Term Work Accommodations form (<http://uoft.me/PSY-MTW>) form to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), along with:

- For the **death of a family member/friend**, provide a copy of the death certificate.
- For U of T varsity-level or professional **athletic commitments**, an email from your coach or varsity administrator should be sent directly to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)) **well in advance** of the missed work, detailing the dates and nature of the commitment.
- For **religious accommodations**, please email Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)) **well in advance** of the missed work.
- For circumstances **outside of these guidelines**, please email Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)) **on or before the date of the test / assignment deadline** to describe your circumstances and determine appropriate documentation.

Documents covering the following situations are NOT acceptable: medical prescriptions, personal travel, weddings, personal/work commitments.

As stated above, your documents must be submitted **within three (3) business days** of the deadline for the missed work.

**For NROB60 if the procedure outlined above is followed, the instructor may permit the following accommodations:**

#### Missed Midterm Lecture Test

There will be no make-up test. Your final lecture exam will count for 45% of your final grade in the course.

#### Missed Midterm Lab Tests 1,2 and 3

There will be no make-up tests. The weight from your missed lab test will be transferred to the final lab test ie the final lab test will be valued at 22% if you miss either lab test 1, 2 or 3. Any student who misses more than 1 lab test in the term must consult with the course instructor via the course email to discuss their personal circumstances.

#### Missed Final Lab Test

A make-up test will be scheduled. Make-up tests may not follow the same format. The date and time of the make-up test will be posted to Quercus and will be conducted in Week 12.

#### Missed Bonus Dissection Protocol Quizzes

There are no make-up quizzes. The goal of these quizzes is to encourage you to be prepared for the weekly lab. Only your best 4 of 6 quiz marks will be used to determine if you receive any bonus marks. Do not submit Missed Term Documentation as outlined in the Policy Notes for this assignment.

### Missed Assignments

There will be no make up for assignment 1 and 2. You are strongly encouraged to complete these assignments in advance of the due date as they are designed to enhance your understanding of course content. Late assignments will be accepted and penalized 10% per 24 hours late.

### **General information which you should be aware of:**

#### **Course Equity, Diversity and 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.

#### **AccessAbility:**

The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs.

Students with diverse learning styles and needs are welcome in this course. If you have a disability that may require accommodations, please feel free to approach me and/or the Accessibility Services\* office.

[AccessAbility Services on the UTSC campus](#)

#### **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.
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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 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 on request.