

Neuroanatomy Laboratory Syllabus (tentative)

NROB60H3 Summer 2020

Professor: Dr. Janelle LeBoutillier

TA Team: Vicki Dong
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Virtual Office Hours: Wednesday 1:30 to 2:30

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).

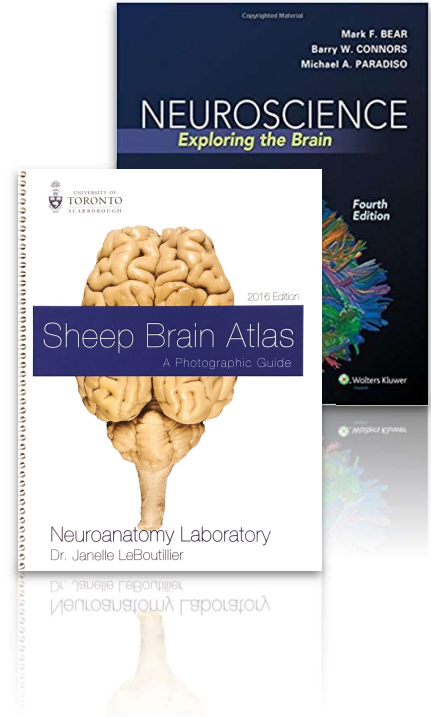
Lab book: **Sheep Brain Atlas: A Photographic Guide, 2016 edition**

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

Lectures: **Web Option tapes available through Quercus**

Labs: Live each week Wed 12-1 on BB collaborate
Labs will be recorded and available only until the next lab occurs. **Recordings can be viewed on BB collaborate by clicking the 3 lines on the top left and selecting the recording.**

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 49%

Midterm Exam (13%)

- 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 (36%)

- Held during final exam period (100 minutes); date TBA by Registrar's Office.
- Covers all lecture content and assigned text-book 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 51%

Midterm Lab Test (10%)

Final Lab Test (29%)

Dissection Protocol Quizzes (10%)

Cranial Nerve Assignment (2%)

COURSE SCHEDULE:

LECTURE SCHEDULE:

The topics and readings **highlighted in yellow** will be included on your first lecture midterm exam. You are responsible for all content in the assigned text readings, unless otherwise noted during lectures.

WEEK	DATE	TOPIC	CHAPTER(S)
1	11 May	Course Introduction <i>Neuroscience: Past, Present and Future</i>	Ch 1
2	18 May	Structure of the Nervous System <i>Gross Organization</i> <i>Anatomical References</i> <i>CNS/PNS</i> <i>Video NOTE THIS WILL BE TESTED ON THE FINAL LECTURE EXAM</i>	Ch 7 (partial) and Appendix (partial)
3	25 May	Development of the Nervous System <i>Meninges</i> <i>BBB & Ventricular system</i> <i>Cranial nerves</i>	Ch 7 (partial) and Appendix (partial)
4	1 June	Cortical Function & Brain Cells <i>The prototypical neuron</i> <i>Glia</i>	Ch 7 (partial) and Appendix (partial) Ch 2
5	8 June	Resting Membrane Potential	Ch 3
6	18 June	Midterm Test Requested TBA by Registrar	
7	22 June	Action Potential	Ch 4
	23 June	Reading week June 23-27. University closed June 29, 30 and July 1	
7	6 July	Action Potential	Ch 4

8	13 July	Principals of Synaptic Integration and Chemical Synaptic Transmission	Ch 5
9	20 July	Neurotransmitter Systems	Ch 6
		<i>Cholinergic neurons</i>	
		<i>Catecholamine neurons</i>	
		<i>Dopaminergic neurons</i>	
10	27 July	Hippocampus	7 and Appendix
11	4 August	Cerebellum & Basal Ganglia	7 and Appendix
12	11 August	Tying it all Together	7 and Appendix

The final exam is 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 May 13.

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:

The content **highlighted in purple** in the following table will be included on your midterm lab test. The final lab test is cumulative, testing the content of Photoseries 1-6. You are responsible for knowing all neuroanatomical structures as presented in the Sheep Brain Atlas: A Photographic Guide, 2016 edition.

LAB DATE	TOPIC	PHOTOSERIES
Week 1: May 13	<ol style="list-style-type: none"> 1. Lab rules You should be familiar with UTSC guidelines when in a lab. 2. Basic Terminology 3. Accessing the on-line atlas 4. Demo of lab test format 5. Gross Anatomy 6. Major sulci and gyri 	1
Week 2: May 20	<ol style="list-style-type: none"> 1. Ventral surface structures 2. Cranial nerves and functions 	1 and 2
Week 3: May 27	<ol style="list-style-type: none"> 1. Mid-sagittal sectioning 2. Identification of mid-sagittal structures 	3
Week 4: June 3	<ol style="list-style-type: none"> 1. Dorsal and lateral dissections 2. Hippocampal dissection 	4
Week 5: June 10	Optional Review	1,2,3,4
Week 5 June 11	Lab Test June 11 on Quercus at noon	
Week 6: June 17	<ol style="list-style-type: none"> 1. Identification of Horizontal structures 	5
June 25	Reading Week June 23-27. University closed June 29, 30 and July 1	
Week 7: July 8	<ol style="list-style-type: none"> 1. Rostral coronal sections 2. Caudal coronal sections 	6
Week 8: July 15	<ol style="list-style-type: none"> 1. Cerebellar coronal sections 	All
Week 9: July 22	Optional Review	All
Week 10: July 29	Final Lab Test July 29 on Quercus at noon	
Week 11: Aug 5	No labs	
Week 12: Aug 12	<ol style="list-style-type: none"> 1. Check final lab grade 2. Office hours for final lecture exam 	

Lab Test Format

Your TA will view 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.

Monitor Quercus regularly for announcements. Dates and times of lab tests will be communicated via Quercus.

- The midterm lab test will cover all content **highlighted in purple** on the lab schedule and will consist of 45 dissecting trays/images with 1 pin each lasting 15 minutes.
- The final lab test will consist of 120 dissecting trays/images with 1 pin each and will be ***cumulative on all lab content (Photoseries 1-6)***. The test will be 40 minutes in length,

Dissection Protocol Quizzes

A total of 7 quizzes will be given in the course with your best 5 counting towards your final grade in the course. These will be based on the study guides for the weekly labs and the dissection videos for each lab and will consist of 9 questions total and will take 4 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 9 am through Quercus.

Quiz 1 Content from Week 1 and 2	Wed May 20
Quiz 2 Content from Week 3	Wed May 27
Quiz 3 Content from Week 4	Wed June 3
Quiz 4 Content from Week 6	Wed June 17
Quiz 5 Content from Week 7	Wed July 8
Quiz 6 Content from Week 7 and 8	Wed July 15
Quiz 7 Content from ALL	Wed July 22

Cranial Nerve Assignment

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.

Vestibulocochlear and Glossopharyngeal nerves

You should submit your first draft of this question to the cranial nerve assignment no later than **Wed June 3 at 9 am.**

Each student will receive 2 cranial nerve questions prepared by their peers to peer review. In addition to answering the nerve questions assigned to you, you should rate the difficulty of the question as easy, moderate or challenging and comment on any inconsistencies or concerns you may have found with the question. Your peer reviews are due no later than **Wed June 10 at 9am.** The author will receive this feedback and submit their final test question to Quercus using TURNITN for evaluation no later than **Wed June 17 at 9 am.** Please read the details on Turnitin below 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.

IMPORTANT POLICY NOTES:

SUMMER 2020: 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

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) to Keely (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) to Keely (keely.hicks@utoronto.ca, along with the Self-Declaration of Student Illness Form (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) to Keely (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) 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) 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) to Keely (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) 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), 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) **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) **well in advance** of the missed work.

☑ For circumstances **outside of these guidelines**, please email Keely (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.

After submitting your documentation:

Within approximately one to five business days, you will receive a response from your instructor detailing the accommodations to be made (if any).

You are responsible for checking your official U of T email and Quercus course announcements daily, as accommodations may be time-critical.

You should continue to work on your assignments to the best of your ability, as extension accommodations may be as short as one business day, depending on the nature of the illness/emergency.

If an accommodation has been granted but you are unable to meet the conditions of the accommodation (ex. you need a longer extension, or you missed a make-up test), you will need to repeat the missed term work procedure and submit additional forms to request further accommodation. Note that in the case of a missed make-up test, an opportunity to write a second make-up test may not be provided.

Completion of this form does NOT guarantee that accommodations will be made. 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.

Missed Accommodations

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

(E.g.) If you miss a make-up midterm, you would need to submit another Request for Missed Term Work Accommodations form. If your original medical note / documentation included the date of the make-up midterm, then only the Request form is required. If the date of the make-up midterm fell outside of the dates indicated on your original medical note/other documentation, then a new medical note/other appropriate documentation must also be submitted.

Importance of Three Business Day window:

If you are unable to submit your documents within the three business day window, **you must email Keely** (keely.hicks@utoronto.ca) **within the three 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.

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.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.utoronto.ca/registrar/missing-examination>).

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 be cumulative and count for 49% of your final grade in the course.

Missed Midterm Bell Ringer Lab Test

There will be no make-up test. Your final lab test will be valued at 39%.

Missed Final Bell Ringer 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. Your final lab will be valued at 29% of your final grade in the course.

Missed Dissection Protocol Quizzes

There are no make-up quizzes. If you miss a quiz for any reason a mark of zero will be assigned. The goal of these quizzes is to encourage you to be prepared for the weekly lab. Only your best 5 of 7 quiz marks will count towards your final grade in the course. Do not submit Missed Term Documentation as outlined in the Policy Notes for this assignment.

Missed Cranial Nerve Assignment

There will be no make up for this assignment valued at 2%.

General information which you should be aware of:

The University of Toronto is dedicated to fostering an academic community in which the learning and scholarship of every member may flourish, with vigilant protection for individual human rights, and a resolute commitment to the principles of equal opportunity, equity and justice.

AccessAbility:

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](tel: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.

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 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.