

Neuroanatomy Laboratory Syllabus (tentative)

NROB60H3 Fall 2018

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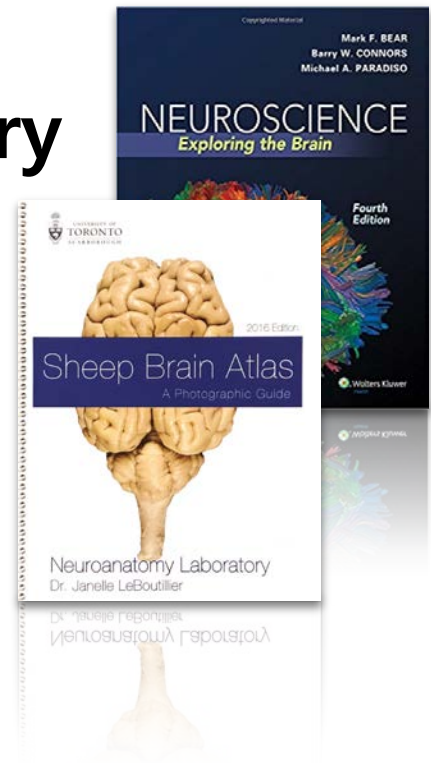
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Textbook: **Neuroscience: Exploring the Brain. 4th edition by Bear, Connors and Paradiso.** We will be covering the first 7 chapters and the appendix in this text. Several options are available to purchase the text (e.g., you may purchase only the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

Lab Text: **Sheep Brain Atlas: A Photographic Guide, 2016 Edition (available at the UTSC bookstore)**

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

Lectures: **Wed 11:00 AM to 1:00 PM in SW309**



Labs: You are expected to attend your scheduled lab section each week.
Any lab section changes must be made through ACORN/ROSI.
Labs start Thursday, September 6th and are conducted in SW242.

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.

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. Weekly lab sessions will cover gross and systems anatomy of the nervous system. Students will dissect sheep brains to examine a wide variety of nervous system structures in 3D. Basic dissecting equipment will be provided, but if you plan to continue in other science labs you may wish to purchase a dissecting kit. Lab coats are required to be worn at all times when in the lab and safety glasses are also required for the dissections. Disposable gloves will be provided. Proper safety procedures, as discussed within the first lab must be followed at all times.

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 50%

Midterm Exam (17.5%)

- TBA by Registrar's Office (90 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 (32.5%)

- Held during final exam period (120 minutes); date TBA by Registrar's Office.
- Tests lecture material covered since the midterm, and textbook chapters 4, 5, 6, plus **all of the content** of chapter 7 + Appendix unless specifically excluded in lecture.

Note: Lecture tests may include multiple choice, short answer, diagrams/labelling, and matching questions. Dates for the midterm exam and the final exam will be assigned by the Office of the Registrar. When this information is available it will be posted to Quercus.

Lab Component – Total 50%

- Midterm Bell Ringer Test (15%)*
- Final Bell Ringer Test (25%)*
- Written Bell Ringer Quiz (5%)*
- Dissection Protocol Quizzes (5%)*
- Bonus Lab Participation Marks (up to 3%)*

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. Dates for each week listed below correspond to the Monday of that week.

| WEEK | DATE | TOPIC | CHAPTER(S) |
|------|---------|---|---|
| 1 | 5-Sept | Course Introduction <i>Neuroscience: Past, Present and Future</i> | Ch 1 |
| 2 | 12-Sept | Structure of the Nervous System <i>Gross Organization</i> <i>Anatomical References</i> <i>CNS/PNS</i> <i>Video</i> | Ch 7 (partial) and Appendix (partial) |
| 3 | 19-Sept | Development of the Nervous System <i>Meninges</i> <i>BBB & Ventricular system</i> <i>Cranial nerves</i> | Ch 7 (partial) and Appendix (partial) |
| 4 | 26-Sept | Cortical Function & Brain Cells <i>The prototypical neuron</i> <i>Glia</i> | Ch 7 (partial) and Appendix (partial) Ch 2 |

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|----------|---------------|--|----------------|
| 5 | 1-Oct | Resting Membrane Potential | Ch 3 |
| | 10-Oct | Thanksgiving & Reading Week (Oct 6-12) | |
| 6 | 17-Oct | Midterm requested (TBA) Lab Test requested (TBA) | |
| 7 | 24-Oct | Action Potential | Ch 4 |
| 8 | 31-Oct | Principals of Synaptic Integration and Chemical Synaptic Transmission | Ch 5 |
| 9 | 7-Nov | Neurotransmitter Systems | Ch 6 |
| | | <i>Cholinergic neurons</i> | |
| | | <i>Catecholamine neurons</i> | |
| | | <i>Dopaminergic neurons</i> | |
| 10 | 14-Nov | Hippocampus | 7 and Appendix |
| 11 | 21-Nov | Cerebellum & Basal Ganglia | 7 and Appendix |
| 12 | 28-Nov | Tying it all Together | 7 and Appendix |

The assigned readings for the final exam (**highlighted in blue**) include Chapters 4, 5, and 6 along with all of Chapter 7 and the Appendix.

LABORATORY COMPONENT:

The lab schedule will be discussed in the first week of labs which start the week of Sept 4. Any changes in your assigned lab section may only be made through ROSI/ACORN. The instructor and TAs cannot make such changes.

Colour printed copies of the *Sheep Brain Atlas: A Photographic Guide* will be available for purchase through the bookstore (**the 2016 edition of the atlas is required**). All students will be able to utilize the online sheep atlas and dissection videos posted on Quercus. Details and a demonstration regarding the use of this atlas will be presented in your first lab.

During the lab, students are required to wear a lab coat at all times, wear closed toed shoes and to follow all lab rules and regulations, which will be discussed at your first lab. You will not be permitted to attend labs if you do not adhere to these rules.

Bellringer Test Format

Your TA will give a demonstration of the bellringer format during the first lab. In brief, specimen samples will be set up in dissection trays with a total of 3 neuroanatomical structures pinned per tray.

You will be given **1 minute** to identify all pins at each tray. Practice bellringers will be set up during most labs.

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

- The midterm bellringer will cover all content **highlighted in purple** on the lab schedule and will consist of approximately 10 dissecting trays with 3 pins each.
- The final bellringer test will consist of approximately 17 trays with 3 pins each and will be *cumulative on all lab content (Photoseries 1-6)*.

The use of cell phones and computers will not be permitted during bellringer tests. All you will need to complete your lab test is a pen and your lab coat. Specific details regarding the bell ringer will be posted to Quercus.

Written Bell Ringer Quiz

This quiz will be based on the content of PS 5 and 6 only and will be held in Week 8.

Dissection Protocol Quizzes

Quizzes will be given at the start of some labs, with a total of 6 administered over the term. Quizzes will be given in **Week 2, 3, 4, 6, 7 and 9**. These will be based on the study guides for the weekly lab and the dissection videos for each lab with the exception of the Week 9 quiz. Week 9 will be based on PS6. The purpose of these quizzes is to encourage you to be prepared for the lab that week. There will be no lab quiz during the first lab. There are no make-up quizzes and you will not be permitted to write the quiz if you arrive late. Only your best 5 quiz grades will count.

Bonus Lab Participation Marks

Up to 3% can be achieved by full attendance and full participation in the 2 review labs. These labs will be held in the week before your mid-term bellringer test (maximum 1% in Week 5) and your final bellringer test (maximum 2% in Week 9). These are bonus marks and there will be no make ups to receive these points if you miss either lab. These marks are offered as incentive for you to participate fully in the review session with the goal of improving you performance on the actual tests.

LAB SCHEDULE:

The content **highlighted in purple** in the following table will be included on your midterm bellringer lab test. The final bellringer 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. Dates for each lab listed below correspond to the Thursday of that week.

| LAB DATE | TOPIC | PHOTOSERIES |
|----------|-------|-------------|
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|-------------------------|---|---------|
| Week 1: September 6 | <ol style="list-style-type: none"> 1. Lab rules 2. Basic Terminology 3. Accessing the on-line atlas 4. Demo of lab test format 5. Gross Anatomy 6. Removal of Meninges 7. Major sulci and gyri | 1 |
| Week 2: September 13 | <ol style="list-style-type: none"> 1. Ventral surface structures 2. Cranial nerves and functions | 1 and 2 |
| Week 3: September 20 | <ol style="list-style-type: none"> 1. Mid-sagittal sectioning 2. Identification of mid-sagittal structures | 3 |
| Week 4: September 27 | <ol style="list-style-type: none"> 1. Dorsal and lateral dissections 2. Hippocampal dissection | 4 |
| Week 5: October 4 | Review and Practice Quiz | 1,2,3,4 |
| Oct 11 | Reading Week (No Labs) | |
| Week 6: October 17 | Mid-term Bell ringer requested (tentative) <i>Details to be posted on Quercus</i> | |
| Week 6: October 18 | 1. Identification of Horizontal structures | 5 |
| Week 7: October 25 | <ol style="list-style-type: none"> 1. Rostral coronal sections 2. Caudal coronal sections 3. Bell ringer test returned | 6 |
| Week 8: November 1 | <ol style="list-style-type: none"> 1. Cerebellar coronal sections 2. Written Quiz | all |
| Week 9: November 8 | Practice Bell Ringer test | all |
| Week 10: November 15 | Lab Test Requested Time TBA | |
| Week 11: November 22 | No labs | |

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|-------------------------|---|--|
| Week 12: November 29 | <ol style="list-style-type: none"> 1. Pick-up Lab Test 2. Confirm final lab grade 3. Office hours for final lecture exam | |
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IMPORTANT POLICY NOTES:

Missed Term Work due to Medical Illness or Other Emergency:

All students citing a documented reason for missed term work must bring their documentation to the Psychology Course Coordinator in SW427C **within three (3) business days** of the assignment due date. You must bring the following:

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

Appropriate Documentation:

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

- Submit an **original** copy of the official 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 emergency room. Forms are to be completed in full, clearly indicating the start date, anticipated end date, and severity of illness. The physician's registration number and business stamp are required.

For missed **ASSIGNMENTS** due to ILLNESS:

- Submit **both** (1.) a **hardcopy** of the Self-Declaration of Student Illness Form (<http://uoft.me/PSY-self-declare-form>), and (2.) the **web-based** departmental declaration form (<http://uoft.me/PSY-self-declare-web>).

For missed term tests or assignments in **OTHER CIRCUMSTANCES:**

- In the case of a **death of a family member**, a copy of a death certificate should be provided.
- In the case of a **disability-related concern**, an email from your Disability Consultant at AccessAbility Services should be sent directly to both the Course Coordinator (psychology-undergraduate@utsc.utoronto.ca) and your instructor, detailing the accommodations required.
- For U of T Varsity **athletic commitments**, an email from your coach or varsity administrator should be sent directly to the Course Coordinator (psychology-undergraduate@utsc.utoronto.ca), detailing the dates and nature of the commitment. The email should be sent **well in advance** of the missed work.

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

Procedure:

Submit your (1.) [request form](#) and (2.) [medical/self-declaration](#)/other documents in person **WITHIN 3 BUSINESS DAYS** of the missed term test or assignment.

Submit to: Course Coordinator, Room SW427C, Monday – Friday, 9 AM – 4 PM

If you are unable to meet this deadline for some reason, you must contact the Course Coordinator via email (psychology-undergraduate@utsc.utoronto.ca) within the three business day window. Exceptions to the documentation deadline will only be made under exceptional circumstances.

Within approximately one week, you will receive an email response from the Course Instructor / Course Coordinator 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.

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.**

Note that 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>).

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 50% 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 40%.

Missed Written Bell Ringer Quiz

There will be no make-up test. The value of this quiz will be added to your final bell ringer ie: Your final bell ringer test will be valued at 30% instead of 25% of your final grade in the course.

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 Bellringer will be valued at 25% 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 or arrive late to the lab a mark of zero will be assigned. The goal of these quizzes is to encourage you to be prepared for the weekly lab. You may only write the quiz in your assigned lab. All quizzes will be given at the start of the lab. Only your best 5 quiz marks will count towards your final grade in the course.

Missed Bonus Labs

There are no make ups for any bonus labs marks missed.

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.