

Neuroanatomy Laboratory Syllabus (tentative)

NROB60H3 Summer 2021

Professor: Dr. Janelle LeBoutillier

TA Team: Vicki Dong
Sadia Riaz

Virtual Office Hours: Wednesday 1:15 to 2:15 by
appointment. Requests should be sent to the course email 24 hours in
advance to allow time to schedule.

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

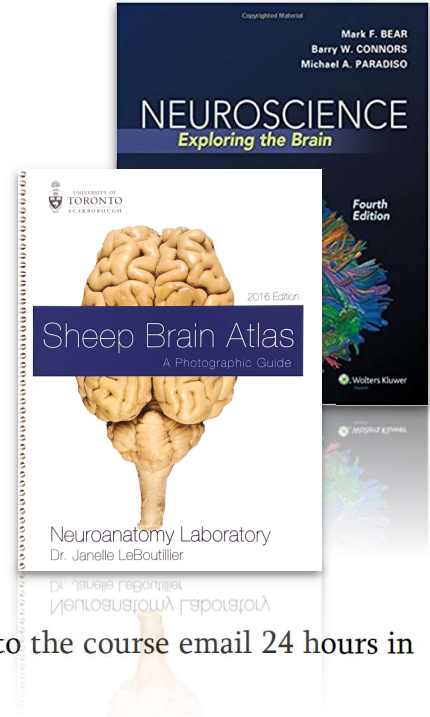
This is the only email account that will be monitored for the course.
Times indicated for labs, tests & office hours are in Toronto time (ET).

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,
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. Summer students will primarily view lectures from the fall 2020 term.

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: On line lectures can be viewed in the Lecture Module on Quercus and are recordings from the Fall semester. Once released, all lectures will remain online until the end of term. Always monitor announcements and review the syllabus for any changes or updates.

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 a weekly lab, you can view available recordings by clicking the three lines on the top left of BB collaborate. Please note all scheduled quizzes and lab tests will be conducted at noon sharp on Wed. As the lab component is asynchronous students are required to be available during this time.

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 (about 45 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.

Lecture tests and quizzes are closed book and non-collaborative in this course. This means that you should not use your text, notes or other sources during any testing and you should be working independently.

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%)

Lab tests and quizzes are closed book but you may create a list of anatomical terms only that you find difficult to spell for quick reference on the tests/quizzes.

Course Schedule:

LECTURE SCHEDULE:

NOTE: UTSC SUMMER TERM RUNS FROM FRI MAY 7 TO WED AUG 11

WEEK	DATE	TOPIC	CHAPTER(S)
1	May 11	Course Introduction Neuroscience: Past, Present and Future	Ch 1
2	May 18	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	May 25	Development of the Nervous System Meninges BBB & Ventricular system Cranial nerves	Ch 7 (partial) and Appendix (partial)
4	June 1	Cortical Function & Brain Cells The prototypical neuron Glia	Ch 7 (partial) and Appendix (partial) Ch 2
5	June 8	Resting Membrane Potential	Ch 3
6	Week of June 15	Midterm Test Requested TBA by Registrar	
	June 22	Reading week June 22-26. No classes	
7	June 29	Action Potential	Ch 4

8	July 6	Principals of Synaptic Integration and Chemical Synaptic Transmission	Ch 5
9	July 13	Neurotransmitter Systems	Ch 6
		Cholinergic neurons	
		Catecholamine neurons	
		Dopaminergic neurons	
10	July 20	Hippocampus	7 and Appendix
11	July 27	Cerebellum & Basal Ganglia	7 and Appendix
12	Aug 3	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 May 12 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.

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
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Week 1: May 12	<ol style="list-style-type: none"> 1. Basic Terminology 2. Demo of lab test format 3. Gross Anatomy 4. Major sulci and gyri 5. Testing your browser for quizzes and tests using the sample quiz link 	1
Week 2: May 19	<ol style="list-style-type: none"> 1. Ventral surface structures 2. Cranial nerves and functions 	1 and 2
Week 3: May 26	<ol style="list-style-type: none"> 1. Mid-sagittal sectioning 2. Identification of mid-sagittal structures 	3
Week 4 June 2	Lab Test 1 on Quercus at noon June 2	1,2,3
Week 5: June 9	<ol style="list-style-type: none"> 1. Dorsal and lateral dissections 2. Hippocampal dissection 	4
Week 6; June 16	1. Identification of Horizontal structures	5
	Reading Week June 22 -26. No classes	
Week 7 June 30	Lab Test 2 on Quercus at noon June 30	4,5
Week 8: July 7	<ol style="list-style-type: none"> 1. Rostral coronal sections 2. Caudal coronal sections 	6a
Week 9: July 14	1. Cerebellar coronal sections	6b
Week 10: July 21	Lab Test 3 on Quercus at noon July 20	all of 6
Week 11: July 28	Final Lab Test on Quercus at noon July 28	All PS 1-6
Week 12: Aug 4	<p>Check your lab mark on Quercus</p> <p>Ask questions about the lecture content</p>	

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 from 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 from 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 noon 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 May 19

Quiz 2 Content from Week 3 Wed May 26

Quiz 3 Content from Week 5 Wed June 9

Quiz 4 Content from Week 6 Wed June 16

Quiz 5 Content from Week 8 Wed July 6

Quiz 6 Content from Week 8 and 9 Wed July 13

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 browser to be the best one to use for uploading the images. If you have difficulties please check this link:

<https://www.vicprovoststudents.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 1. submit your first draft of the cranial nerve on time, 2. provide feedback for your 2 peer-reviewed cranial nerve assignments and comment on the difficulty of each question by the due date, and 3. 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 **June 2 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 June 2 you will randomly be assigned 2 cranial nerve assignments to peer review. For each nerve assignment you receive you should 1. indicate the nerves involved, 2. rate each question as to its difficulty and 3. provide brief 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 **June 9 at 9 am**
3. Students should submit their final nerve question and answer through Turnitin on Quercus no later than **June 16 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. **Remember to include your answer with the question for this submission.**

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. Preparing these samples will help you study for your lab tests by examining different examples of sheep brain dissections.

1. Search the internet for sheep brain images and prepare 5 sample trays which could be used for sample test or quiz questions in the course. The format should be the same as what you have seen for all tests in the course.
2. Include the source/internet link for each image.
3. Each image should have only 1 question and answer. Be sure spelling is correct.
4. You must choose cuts from 5 different photoseries. For example, you can include an image from PS1,2 4,5,and 6. Do not include 2 images from the same photoseries and do not use the same image twice.
5. Include cuts from different planes of section i.e. coronal, sagittal or transverse, or whole brain. You must include sample images from at least 3 of these 4 listed options. For example, you could include 2 coronal, 2 sagittal and 1 whole brain. You are strongly encouraged to include as many different cuts as possible to allow you to become more familiar with course content.
6. Include a range of difficulty in your questions, i.e.; Do not include all easy structures to identify. Remember, the goal of this assignment is to help you prepare for your final test.
7. The assignment is due no later than **July 13 at 9 am**. Late assignments will be accepted and penalized 10% per 24 hours late.
8. There is no required file submission format required. e.g.; You can submit your file as a pdf or other.

IMPORTANT INFORMATION FOR PSYCHOLOGY COURSES

Psychology Department Missed Term Work Policy, SUMMER 2021

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

Notes:

- 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.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.utoronto.ca/registrar/term-work>

Accommodations for Illness or Emergency:

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

1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>) and email it to Keely Hicks at keely.hicks@utoronto.ca,
and
2. **Declare your absence** on [ACORN](#) (Profile & Settings > Absence Declaration)

Deadline: You must complete the above steps **within 3 business days** of the missed work.

Note: For this semester, we do not require any additional supporting documentation (ex. 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:

1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>), choosing “Other” as your reason for missed work 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 Keely Hicks (keely.hicks@utoronto.ca).

Deadline: You should report the conflict to Keely Hicks (keely.hicks@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.

Note: Multiple assignments due on the same day are not 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 not considered conflicts.

Note: 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:

1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>), choosing “Other” as your reason for missed work and noting “Religious conflict” in the space provided.
2. Email the form to Keely Hicks (keely.hicks@utoronto.ca).

Deadline: You should report the conflict to Keely Hicks (keely.hicks@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 Keely Hicks (keely.hicks@utoronto.ca)

Deadline: You should report the conflict to Keely Hicks (keely.hicks@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 Students Registered with AccessAbility Services:

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

- **Contact 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 3 days):
 1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>).
 2. Email the form and your **Accommodation Letter** to Keely Hicks (keely.hicks@utoronto.ca).
- 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):
 1. **Contact your AccessAbility consultant** and have them email Keely Hicks (keely.hicks@utoronto.ca) detailing the accommodations required.

Accommodation Procedure:

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.

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, noting that you have submitted your Missed Term Work Accommodations Request Form to Keely.

Note that ACORN will not allow you to declare **future absences**. For something like a scheduled surgery or an illness with a prolonged recovery period, if you would like to request accommodations in advance of the assignment deadline or midterm you should submit a Verification of Illness Form (<http://uoft.me/UTSC-Verification-Of-Illness-Form>) completed by your doctor, along with this form to Keely Hicks (keely.hicks@utoronto.ca).

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

(E.g.) If you are given an extension but are still sick and need more time, or if you miss a make-up midterm, you would need to submit another Request for Missed Term Work Accommodations form and declare your extended absence on ACORN.

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**.

Questions?

If you have any questions about this Missed Term Work policy, please contact Keely Hicks (keely.hicks@utoronto.ca) **well before** the date of the test / assignment deadline to describe your circumstances and inquire about procedures.

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. Instead, you will write a final exam valued at 10% of the course and an additional cumulative test valued at 12% of the course. 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.

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.