

Neuroscience 2000
Introduction to Neuroscience

Course Syllabus for Fall/Winter 2023/24



Western University is committed to a **thriving campus**; therefore, your health and wellness matter to us! The following link provides information about the resources available on and off campus to support students: <https://www.uwo.ca/health/> Your course coordinator can also **guide you** to resources and/or services should you need them.

1. Technical Requirements:



Stable internet connection



Laptop or computer



Working microphone



Working webcam

2. Important Dates:



Classes Begin	Reading Week	Classes End	Study day(s)	Exam Period
September 7	October 30– November 5	December 8	December 9	December 10–22

*September 16, 2022: Last day to register for a full course and full-year half course

* November 30, 2022: Last day to drop a first-term full course without penalty

Classes Resume	Reading Week	Classes End	Study day(s)	Exam Period
January 8	February 17-25	April 8	April 9-10	April 11–30

3. Contact Information

Course Coordinator	Contact Information
Dr. Derek Mitchell	OWL message



Instructors	Contact Information
Dr. Julio Martinez-Trujillo	julio.martinez@robarts.ca
Dr. Derek Mitchell	Owl message
Dr. Susanne Schmid	susanne.schmid@schulich.uwo.ca
Dr. Brian Corneil	bcorneil@uwo.ca
Dr. Andrew Deweyert	adeweyer@uwo.ca
Teaching Assistants	Contact Information
Matthew Jones	mjone82@uwo.ca
Bradley Karat	bkarat@uwo.ca
Alice Zheng	azheng22@uwo.ca

4. Course Description and Design

Delivery Mode: In person. However, due to individual circumstances and any changes in COVID restrictions, some lectures and labs may be delivered remotely (please watch out for announcements). Due to the ongoing and evolving COVID-19 pandemic, additional changes to the course syllabus may be required as the 2022/2023 academic year progresses. This may include changes to the delivery mode (e.g., greater reliance on an online format). Please read course announcements and visit the OWL site regularly to stay up-to-date.

A comprehensive introduction to the neurosciences. Topics include molecular and cellular properties of neurons; neural plasticity; development of the brain and nervous system; sensory, motor and integrative systems; neural mechanisms of behaviour and cognition, including memory, language, and consciousness. Molecular and genetic techniques, electrophysiological recording, and brain imaging methods will be examined.

Antirequisites: None

Prerequisites: Psychology 1000 or the former Psychology 1200 with a minimum mark of 60%; either Biology 1001A or 1201A with a minimum mark of 60%; and either Biology 1002B or 1202B with a minimum mark of 60%.

4 lecture/discussion hours, 1.0 course

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Timetabled Sessions

- Pre-work (where indicated via announcements) must be completed prior to sessions
- Attendance at sessions when health permits is required to succeed
- Missed work should be completed within 24 hours and handed-in within 24 hours of the end of the accommodated period unless other specific arrangements are made with the course coordinator in writing

All course material will be posted to OWL: <http://owl.uwo.ca>. Any changes will be indicated on the OWL site and discussed with the class.

If students need assistance, they can seek support on the [OWL Help page](#). Alternatively, they can contact the [Western Technology Services Helpdesk](#). They can be contacted by phone at 519-661-3800 or ext. 83800.

[Google Chrome](#) or [Mozilla Firefox](#) are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#).

5. Learning Outcomes



The course begins with the study of nerve cells: their structure, the propagation of nerve impulses and transfer of information between nerve cells, the effects of drugs on this process, and the development of nerve cells in the brain and spinal cord. We also examine the overall structure of the nervous system and its development. We then move onto functional sensory systems such as vision, hearing, touch, smell, balance, and taste, and motor control. We will discuss how physical energy such as light is converted into neural signals, where these signals travel in the brain, and how they are processed. We will cover how the brain controls movement from a bottom-up perspective, beginning with the spinal cord and muscle contraction, moving through integrative control by the brainstem, cerebellum, and basal ganglia, and finishing with considerations of the cortical control of movement. Finally, we will study eating & drinking, language, emotion, memory, mental illness, and neurological disorders. From this course, you should obtain a solid understanding of the basics of brain function and neuroscience.

Goals:

- Learn the structure and function of our nervous system.
- Learn how our brain compresses and analyzes incoming information
- Learn how the brain controls movement
- Learn the beauty and sophistication of our neurological systems

6. Course Content and Schedule

Week	Topic	Instructor	Chapter Readings
1	Intro to course	Mitchell	1
	Brain Structure and Development	Deweyert	7
2	Brain Day (Tutorial/Lab 1)	Deweyert/TAs	7
	Neurons and Glia	Trujillo-Martinez	2
3	Brain Day (Tutorial/Lab 2)	Deweyert/TAs	3
	The Neuronal Membrane at Rest	Martinez-Trujillo	
4	The Action Potential	Martinez-Trujillo	4
5	Synaptic Transmission	Martinez-Trujillo	5
6	Action potential (Lab 3)	TAs	6
	Neurotransmitters and Receptors	Martinez-Trujillo	
7	EXAM 1 (Weeks 1-6)	9:30am Location: TBD	8
	The Olfactory and Gustatory Systems	Schmid	
8	Reading Week		
9	Make-up Exam	9:30am Location TBD	9
	The Eye	Schmid	
10	Attention	Mitchell	21
11	Sensory Lab I (Lab 4)	Schmid/TAs	10
	The Visual System	Schmid	
12	Sensory Lab II (Lab 5)	Schmid/TAs	11
	Auditory System & Vestibular Systems	Schmid	
13	Exam Review (Optional)	TAs	12
	The Somatosensory System	Schmid	
	EXAM 2 - During Exam Period (Weeks 7-13)	TAs/Location TBD	



Week	Topic	Instructor	Chapter Readings
14	Spinal Control of Movement	Corneil	13
15	Make-up Exam	9:30am Location TBD	14
	Central Control of Movement	Corneil	
16	Motor systems (Lab 6)	Corneil/TAs	14
	Modulation of Movement: Basal Ganglia & Cerebellum	Corneil	
17	Motor systems (Lab 7)	Corneil/TAs	
	Eye Movements	Corneil	
18	Motor Systems (Lab 8)	Corneil/TAs	15
	Visceral System, ANS, and Hypothalamus	Corneil	
19	Exam Review (Optional)		16
	Motivated Behaviour and Executive Control	Corneil	
20	Reading Week		
21	EXAM 3 (Weeks 14-19)	TAs/ Location TBD	18
	Brain Mechanisms of Emotion	Mitchell	
22	Cognitive Neuroscience Techniques (Lab 9)	Mitchell/TAs	20 & Lab notes
	Language	Mitchell	
23	Make-up Exam	9:30am Location TBD	17
	Hormones & Sex	Sheppard (Guest lecture)	
24	fMRI (Lab 10)	Mitchell/TAs	24
	Memory	Mitchell	
25	Mental Illness	Mitchell	22
26	No lab		23
	Wiring the Brain	Machado (Guest lecture)	
27	Neurological Disorders/Review (Lab 11)	TAs	

	EXAM 4 - During Exam Period (Weeks 21-26)	TAs/Location TBD	
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7. Participation and Engagement



- Students are expected to participate and engage with content as much as possible
- Students can also participate by interacting in the forums with their peers and instructors

8. Evaluation

Below is the evaluation breakdown for the course. Any deviations will be communicated.

Assessment	Format	Weighting	Due Date
Exam	Multiple Choice/short answer	80% (4 x 20%)	See schedule
Projects	Essay/report	20% (2 x 10%)	TBD



- All projects are due at 11:55PM EST unless otherwise specified
- Written projects will be submitted to Turnitin (statement in policies below)
- Students will have unlimited submissions to Turnitin but NOT exams.
- After an assessment is returned, students should wait 24 hours to digest feedback before contacting their evaluator; to ensure a timely response, reach out within 7 days
- Any grade appeals must be received within 3 weeks of the grade being posted.
- 15% of your course grade will be evaluated and returned 3 days prior to the drop deadline (statement in policies below).

Note: Exams are weighted towards new material. However, because of the inherently inter-related nature of the brain and Neuroscience, success on any exam will require cumulative knowledge of the material that preceded it

Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

90-100	One could scarcely expect better from a student at this level
80-89	Superior work which is clearly above average
70-79	Good work, meeting all requirements, and eminently satisfactory
60-69	Competent work, meeting requirements
50-59	Fair work, minimally acceptable
below 50	Fail

Information about late or missed evaluations:

- Late assessments without accommodation will receive a grade of 0. Late projects will be subject to a late penalty of 15% per day.
- An assessment cannot be submitted after it has been returned to the class; for approved accommodation, an alternate assessment may be assigned
- There is no reweighting in Neuroscience 2000. All course components must be included in the calculation of any grades (missed assessments, projects, essays etc. will receive a mark of 0).
- If a make-up assessment is missed, but an approved accommodated absence is obtained, a student will receive an INC or SPC and complete the assessment the next time the course is offered

INC (Incomplete Standing): If a student has been approved by the Academic Counselling Office (in consultation with the instructor/department) to complete term work at a later date, an INC will be assigned. Students with INC will have their course load in subsequent terms reduced to allow them to complete outstanding course work. Students may request permission from Academic Counselling to carry a full course load for the term the incomplete course work is scheduled.

SPC (Special examination): If a student has been approved by the Academic Counselling Office to write a Special Examination and the final exam is the only outstanding course component, an SPC will be assigned. If the class has a makeup exam, the student is expected to write the makeup exam. If the class doesn't have a makeup exam or the student misses the makeup exam for reasons approved by the Academic Counselling Office, the student will write the exam the next time the course is offered. Outstanding SPCs will reduce the course load for the term the exam is deferred as outlined in [Types of Examinations](#) policy.

9. Communication:



- Students should check the OWL site every 24–48 hours
- Students should email their instructor(s) and teaching assistant(s) using the preferred method listed above
- Emails will be monitored each weekday students normally receive a response in 24–48 hours, and if not, please send a reminder email
- This course will use the OWL forum for discussions
- Students should post all course-related queries on the discussion forum so that everyone can access the questions and responses. Discussion forums will be monitored regularly by instructors and/or TAs.

10. Office Hours:



- Office hours can always be arranged either in person or via Zoom by request
- Announcements for any additional set office hours will be sent via announcement for each instructor

11. Resources



- Some resources will be posted in OWL
- Required textbook: Neuroscience: Exploring the Brain (either the 3rd or 4th Edition) By Mark F. Bear, Barry W. Connors, and Michael A. Paradiso. Lippincott, Williams & Wilkins, 2007 (3rd Edition; may be available used at the Bookstore) or 2016 (4th Edition)
- Required software for select labs: MotorLab 2022 software**, Detailed installation instructions for Windows, Mac and Chromebook/Linux users are available at (<https://motorlab.ca/download/>) and activation codes can be purchased for **\$6 CAD/license** (<https://motorlab.ca/purchase/>). The software will allow students unlimited access to all 27 lab activities until **August 30, 2024**.
- simplified and streamlined installation process for both Mac and Windows users. Students can now download (<https://motorlab.ca/download/>) and install (<https://motorlab.ca/support/>) the software directly from our website (<https://motorlab.ca/>), for the cost of \$5 CAD/license. The software will allow students unlimited access to all 22 lab activities in the package until the license expiry date of August 30, 2022.
- To complete other lab or tutorial assignments, students will occasionally be required to download open source software or other online materials

12. Professionalism & Privacy:



Western students are expected to follow the [Student Code of Conduct](#). Additionally, the following expectations and professional conduct apply to this course:

- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared (e.g., Must Knows Facebook group, Course Hero, Chegg, etc.)
- Recordings are not permitted (audio or video) without explicit permission
- Permitted recordings are not to be distributed
- Students will be expected to take an academic integrity pledge before some assessments

Western is committed to providing a learning and working environment that is free of harassment and discrimination. All **students**, staff, and faculty have a role in this commitment and have a responsibility to ensure and promote a safe and respectful learning and working environment. Relevant policies include Western's [Non-Discrimination/Harassment Policy](#) (M.A.P.P. 1.35) and [Non-Discrimination/Harassment Policy – Administrative Procedures](#) (M.A.P.P. 1.35).

Any **student**, staff, or faculty member who experiences or witnesses' behaviour that may be harassment or discrimination **must report the behaviour** to the Western's [Human Rights Office](#). Harassment and discrimination can be human rights-based, which is also known as EDI-based, (sexism, racism, transphobia, homophobia, islamophobia, xenophobia, antisemitism, and ableism) or non-human rights-based (personal harassment or workplace harassment).

13. How to Be Successful in this Class:

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.



1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule your time throughout the course.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted to help you succeed in this class.
3. Follow weekly checklists created on OWL or create your own to help you stay on track.
4. Take notes as you go through the lesson material. Keeping handwritten notes or even notes on a regular Word document will help you learn more effectively than just reading or watching the videos.
5. Connect with others. Try forming a study group and try meeting on a weekly basis for study and peer support.
6. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor(s) and or teaching assistant(s).
7. Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.

14. Western Academic Policies and Statements

Absence from Course Commitments

A. Absence for medical illness:

Students must familiarize themselves with the [Accommodation for Illness Policy](#).

A student seeking academic accommodation for any **work worth less than 10%** must contact the instructor or follow the appropriate Department or course specific instructions provided on the course outline. Instructors will use good judgment and ensure fair treatment for all students when considering these requests. You are not required to disclose details about your situation to your instructor; documentation is not required in this situation, and you should not send any pictures to your instructor.

If you are unable to meet a course requirement for any **work worth 10% or greater** due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Academic Counseling as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. Please note that the format of a make-up test, exam, or assignment is at the discretion of the course coordinator.

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found at: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

B. Absence for non-medical reasons:

Student absences might also be approved for non-medical reasons such as religious holidays and compassionate situations. Please review the policy on [Accommodation for Religious Holidays](#). All non-medical requests must be processed by Academic Counselling. Not all absences will be approved; pay attention to the academic calendar and final exam period when booking any trips.

C. Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examinations dates. These dates as well as other important information about examinations and academic standing can be found [here](#).

Academic Offenses

Scholastic offences are taken seriously, and students are directed [here](#) to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review [The policy on Accommodation for Students with Disabilities](#)

Correspondence Statement

The centrally administered **e-mail account** provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts [here](#).

Discovery Credit Statement

Students are permitted to designate up to 1.0 Discovery Credit course (or equivalent) for pass/fail grading that can be counted toward the overall course credits required for their degree program. The details of this policy and the deadlines can be found [here](#).

Turnitin and other similarity review software

All projects will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. Students will be able to view their results before the final submission. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and [Turnitin.com](#).

15% Rule

According to the [Evaluation of Academic Performance](#) policy, at least three days prior to the deadline for withdrawal from a 1000- or 2000-level course without academic penalty, students will receive assessment of work accounting for at least 15% of their final grade. Generally, students can expect some form of feedback on their performance in a course before the drop date. In rare instances, at the Dean's discretion, an exemption can be issued, which also must be noted in the course syllabus. Deans should review exemptions on a course-by-course basis each time an exempted course is offered.

15. BMSUE Academic Policies and Statements

Cell Phone and Electronic Device Policy (for in-person tests and exams)

The Schulich School of Medicine & Dentistry is committed to ensuring that testing and evaluation are undertaken fairly across all our departments and programs. For all tests and exams, it is the policy of the School that any electronic devices, i.e., cell phones, tablets, cameras, or iPod are strictly prohibited. These devices **MUST** be left either at home or with the student's bag/jacket at the front of the room and **MUST NOT** be at the test/exam desk or in the individual's pocket. Any student found with one of these prohibited devices will receive a grade of zero on the test or exam. Non-programmable calculators are only allowed when indicated by the instructor. The program is not responsible for stolen/lost or broken devices.

Copyright and Audio/Video Recording Statement

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. You must always ask permission to record another individual and you should never share or distribute recordings.

Rounding of Marks Statement

Across the Basic Medical Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. **Final grades** on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks **WILL NOT** be bumped to the next grade or GPA, e.g., a 79 will **NOT** be bumped up to an 80, an 84 **WILL NOT** be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark "bumping" will be denied.

16. Support Services

The following links provide information about support services at Western University.

[Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence \(either recently or in the past\), you will find information about support services for survivors, including emergency contacts at](#)

https://www.uwo.ca/health/student_support/survivor_support/get-help.html

[To connect with a case manager or set up an appointment, please contact support@uwo.ca.](#)

[Academic Counselling \(Science and Basic Medical Sciences\)](#)

[Appeal Procedures](#)

[Registrarial Services](#)

[Student Development Services](#)

[Student Health Services](#)