DALHOUSIE UNIVERSITY

Cellular Neuroscience
NESC/PHYL/PSYO 2570.01, Fall 2026
Faculty of Science Course Syllabus
Department of Psychology & Neuroscience
September 8th - December 9th

Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.
Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.

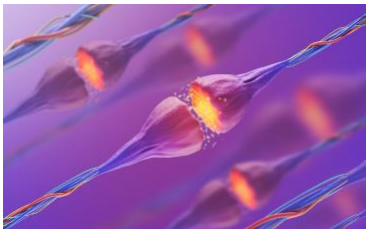
Instructors: Dr. L Caceres lucia.caceres@dal.ca
Dr. S. Krueger Stefan.krueger@dal.ca

Coordinator: Dr. L Caceres lucia.caceres@dal.ca
TA: Celia Glenham

Class Schedule: Blended
Location: Sir James Dunn Building room 117
Lectures: Tuesdays and Thursdays: 8:35 am – 9:55 am.

Test Schedule:
Unit tests: October 6th, November 3rd
Final Exam: Scheduled by registrar

Office Hours: In lieu of regular office hours, we had scheduled in-person tutorials once a week during one of the two scheduled lecture periods (please see pg. 5 for dates). In addition, we encourage everyone to post questions on the discussion board in Brightspace.



Course Description

[From calendar] This course explores the brain at the neuronal level. Material covered includes: the ionic basis of resting potentials, the electrical activity of neurons, synaptic transmission and plasticity, synthesis and action of synaptic transmitters, and drug action. Cellular phenomena relevant to healthy and neurologically dysfunctional systems are also discussed.

Course Prerequisites: [From Calendar] Introduction to Psychology I (PSYO 1011.03 or PSYO 1021.03 or PSYO 1031.03) and Introduction to Psychology II (PSYO 1012.03 or PSYO 1022.03 or PSYO 1032.03) EACH with a grade of B- or better, or Principles of Biology I (BIOL 1010.03 or BIOL 1020.03) and Principles of Biology II (BIOL 1011.03 or BIOL 1021.03) EACH with a grade of B- or better, OR SCIE 1506.09 and SCIE 1507.09 EACH with a grade of B- or better, or SCIE 1505X/Y.18 with a grade of B- or better.

Learning Outcomes

- Explain how electrical signals are produced and transmitted in the brain.
- Describe how neurons use chemical signals to communicate.
- Explain the mechanism, underlying neuronal plasticity.

Course Structure

See **Assessment** and **Course Content** sections for in-person meeting times. Asynchronous lecture videos will be posted on Brightspace, but in-person lectures/tutorials will not be recorded. All exams will be in-person. Midterm and final will be in person and quizzes will be online.

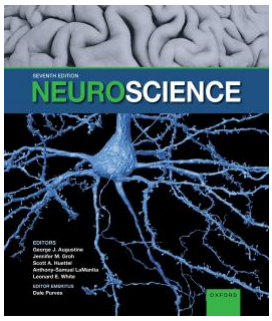
Notes on blended course delivery:

- Online Content will be delivered via Brightspace.
- Minimum technology: this course requires internet access, sufficient hardware to navigate Brightspace (e.g. view lecture PDFs and Panopto videos, completing computer-based quizzes, etc.), and to engage in Microsoft Teams consultations during office hours.
- If a student can provide evidence of power/technology malfunction during a computer-based quiz, the weight of that quiz will be transferred to the final exam.
- All exams, due dates, meetings are scheduled on Halifax Time (GMT-3).
- If students connect to online resources from outside Canada, they are responsible for ensuring awareness and compliance with any applicable laws in the country from which they are connecting.

Course Materials

The Dalhousie bookstore will be supplying physical and digital versions of this textbook (ISBN-9780197616246). **Students may use second-hand textbooks**.

Textbook



Neuroscience, 7th Edition, Purves, Augustine, Groth, Huettel, LaMantia, White, Publication Year: 2023 | 1008 pp.
Oxford Univeristy Press

Brightspace site

This site will be used for making announcements regarding the course, posting slides and recorded lectures, writing quizzes, viewing grades, etc. You are expected to **check Brightspace regularly for new content**, announcements, and potential schedule changes. If you have difficulties accessing or using Brightspace, please contact the folks at UCIS/WebCT for help.

Lecture Notes: Lecture notes are **the students' responsibility**. PDF files of PowerPoint slides covering important points of each chapter will be posted on the Brightspace site, and we will provide a narrated online walk-though for each set of slides via Panopto. However, these slides are not complete and will need to be supplemented by notetaking.

Course Assessment

Component	Weight (% of final grade)	Date	Duration/format
Online Quiz 1 (Ch. 1+2)	0.5%	Sep. 15th, 2026	10-20 min – computer online
Online Quiz 2 (Ch. 3)	0.5%	Sep. 22nd, 2026	10-20 min – computer online
Online Quiz 3 (Ch. 4)	0.5%	Sep. 29th, 2026	10-20 min – computer online
Midterm 1 (Chapters 1- 4)	28.5%	Oct. 6th, 2026	70 min. – Paper in-person
Online Quiz 4 (Ch. 7)	0.5%	Oct. 13th, 2026	10-20 min – computer online
Online Quiz 5 (Ch. 5.1)	0.5%	Oct. 20th, 2026	10-20 min – computer online
Online Quiz 6 (Ch. 5.2)	0.5%	Oct. 27th, 2026	10-20 min – computer online
Midterm 2 (Chapters 5, 7)	28.5%	Nov 3rd, 2026	70 min. – Paper in-person
Online Quiz 7 (Ch. 6)	0.5%	Nov. 17th, 2026	10-20 min – computer online
Online Quiz 8 (Ch. 8)	0.5%	Nov. 24th, 2026	10-20 min – computer online
Online Quiz 9 (Sensory Transduction)	0.5%	Dec. 1st, 2026	10-20 min – computer online
Final Exam (Cumulative)	38.5%	Scheduled by Registrar*	120 min – paper in-person

Conversion of numerical grades to final letter grades follows the Dalhousie Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (0-49)
A- (80-84)	B- (70-72)	C- (55-59)	

NOTE: Grades are final at the end of term and cannot be "bumped up" with extra work.

Assessment notes:

- Each COMPUTER-BASED ONLINE QUIZ is asynchronous and will open for 48 hours on the date listed on the table above. You will need an online device to access Brightspace to complete the quiz.
    - Quizzes will consist of 5-10 questions in a variety of formats (multiple choice, multi-response, fill-in-the-blank).
    - Once the quiz is initiated, students will have between 10 and 20 minutes to complete all the questions. (~90-120 s per point on the test).
    - An automatic 48 f-hour extension will be applied to online quizzes.

- In-person **MIDTERMS** will take place in the classroom at the regularly scheduled meeting time and will be exclusively multiple choice.

- * The **final** will be scheduled by the Registrar during the exam period. Do not plan to leave Halifax before the end of the exam period; travel is not a valid circumstance to reschedule the final exam.

1. Timing and schedule

You will need time to work on course material. You will have opportunities to complete some course components on your own schedule. The due dates for each component will be clearly marked on Brightspace.

2. Computer and Internet for submitting Assessment Questions on Brightspace.

Assignments will have a due date plus a "window of opportunity" (48 hrs) to give you enough time to complete them on time even if you have temporary technical problems. *For example*, an assignment due on Monday at 5pm will have a window of opportunity of 48hrs (2-days) to submit without penalty. However, **after this window of opportunity is missed a grade of zero will be assigned and not late assignments will be accepted.**

Postponing a test or assignment until the end of the availability window is risky, so it is better to submit early.

Course Content: Tentative lecture topic guide

Week of...		Day	Lecture topic	In-person meeting	Assessments
Sept.	8	Tue	**Ch. 1: Intro to neurons and glia**	Yes	
	10	Thu	**Ch. 2: Nerve Excitability**	No	
	15	Tue	Tutorial (Chapters 1+2)	Yes	Quiz 1
	17	Thu	**Ch. 3: Membrane Properties**	No	
	22	Tue	Tutorial (Chapter 3)	Yes	Quiz 2
	24	Thu	**Ch. 4: Ions Channels**	No	
	29	Tue	Tutorial (Chapter 4)	Yes	Quiz 3
Oct.	1	Thu	Pre-midterm 1 review	Yes	
	6	Tue	**Midterm 1 (Ch. 1-4)**	Yes	Midterm 1
	8	Thu	**Ch. 7: Molecular Signalling**	No	
	13	Tue	Tutorial (Chapter 7)	Yes	Quiz 4
	15	Thu	**Ch. 5: Synaptic Transmission Part I - Electrical and Chemical Synapses**	No	
	20	Tue	Tutorial (Chapter 5 Part I)	Yes	Quiz 5
	22	Thu	**Ch. 5: Synaptic Transmission Part II - Neurotransmitter Release**	No	
	27	Tue	Tutorial (Chapter 5 Part II)	Yes	Quiz 6
	29	Thu	Pre-midterm 2 review	Yes	
Nov.	3	Tue	**Midterm 2 (Ch. 5 and 7)**	Yes	Midterm 2
	5	Thu	**Ch. 6: Neurotransmitters and Receptors**	No	
	9-13	**Fall Break**			
	17	Tue	Tutorial (Chapter 6)	Yes	Quiz 7
	19	Thu	**Ch. 8: Synaptic Plasticity**	No	
	24	Tue	Tutorial (Chapter 8)	Yes	Quiz 8
	26	Thu	**Assorted: Sensory Transduction**	No	
Dec.	1	Tue	Tutorial (Transduction)	Yes	Quiz 9
	3	Thu	**Final Review - All**	Yes	
	8	Tue	Lieu day to accommodate the Thanksgiving Day (Monday Schedule)		
	11-20		**Final Exam Period (2-hrs; Cumulative)**		

Course Policies

1. Email

When sending an email please make sure of the following:

1. Read the syllabus and check the Brightspace page to determine if the information you seek is already available.
2. If you have multiple questions regarding lecture material, it is best to attend office hours.
3. Enter the course number in the subject line (PSYO 2570, PHIL 2570 or NESC 2570).
4. Please enter your B# in your email signature.

2. Exams must be taken at the scheduled time.

- Students writing at the accessibility center are responsible to schedule their exams. It is recommended to book all midterms the first week of classes.
- Students who fail to book a room at the accessibility center must write the midterm(s) with the entire class.
- It is the responsibility of the student to check the course schedule and tell me of any religious holy days, required court appearances, or scheduled surgeries within the first week of the course.

3. Quizzes Due dates. All Brightspace material will be available for viewing throughout the length of the course, but the quizzes **must be completed at their assigned due dates.**

Quizzes questions **are due at 5 pm 2-days after it is assigned.**

- A **Tuesday assessment questions** opens at 10:01 am and are **due** at 10:00 am **on Thursday**.

  Need more time? Assignments have a no-penalty "late" submission window of 48 hrs after their due date. However, they will permanently close on their end date (48 hrs afters their due date). No assignments will be accepted after this end date has been reached.

- **Tuesday quiz questions** can be submitted with **no penalty** for up to **2 days** (48 hrs) **after its due date**, with an **End date/time: Saturday 12:00 pm.**
- All assessment questions, whether they open on a Tuesday, will **PERMANENTLY close for marks** on their **12:00 pm end date**. **SDAs will not be accepted –** *SDAs are only allowed for short term absences of 3-consecutive days or less.*

  Please don't leave assignments until the window is closing. There are no late submission options and no marks after 12:00 pm of their **end time**. Remember that assignments were due 2 days before the closing date. This closing date is just an automatic extension for unexpected problems.

Extended window of opportunity is meant to take care of temporary issues with a busy schedule, technology, internet, electricity, weather, and other minor issues.

4. AI usage

Online quizzes are intended to help you assess your understanding of the course material and identify areas that may require further review. Using AI tools to answer quiz questions undermines this purpose, as it does not provide an accurate representation of your own understanding and may negatively impact your learning and preparedness for in-person assessments, such as midterms and the final exam, where AI tools are not available. It can also reduce opportunities to practice independently recalling, applying, and explaining the material, which may leave students less prepared for closed-book, in-person assessments. Therefore, students are strongly discouraged from using AI tools during online quizzes.

5. Student Declaration of Absence (SDA):

⇒ SDA forms are only valid for short-term absences (three consecutive days of absence).

Missed midterms due to illness or exceptional circumstances **must** be communicated to the instructor **immediately** by

I. Student must submit an **SDA to Brightspace** only (do not email SDAs or drop SDAs off in person).
II. **A completed SDA MUST be signed and dated.** A grade of zero will be assigned of SDA is not signed and dated.
III. **SDA needs to be submitted within 3 days (72hrs) of the missed exam** for the SDA to be valid.

Please note: If SDA is approved, no alternative make-up exams will be given, instead the weight of the missed exam will be transferred to the cumulative final. Only **ONE SDAs will be accepted per term**.

Note: Student Declaration of Absence forms should normally be submitted before missing a test. In circumstances when this is not possible submit your form as soon as it is safe and logical to do so.

6. Testing Protocol

General - all head coverings must be removed or adjusted so invigilators have an unobstructed view of student's gaze direction. Students may not use their own paper during an exam, nor are they permitted to take any paper with them that they were supplied during the quiz/exam. Quizzes and exams are "closed-book", which means no information other than the questions themselves is to be accessible during the quiz/exam. You must complete all quizzes and exams alone with no consultation/collaboration with other people.

Computer-based quizzes - students are expected to complete quizzes online. Only one online device should be available for each student, and only the Brightspace page should be accessed during quizzes (no google searches, messaging apps, etc.).

On paper exams – No electronic devices may be accessed or visible during paper exams. Phones must be turned off and stored before entering the exam room. Come prepared to examinations – bring pencils/pens, erasers, etc.

7. Distributing Course Materials

Students will have access to lecture slides and recorded lectures throughout this course. However, under no circumstances is this material to be shared, posted online, or distributed in any other way. Personal copies of recordings must be destroyed at the end of term. Furthermore, students do not have permission to revise, modify, share, post on-line, or redistribute in any manner - electronic or otherwise - any of the lecture materials.

8. Short-term Absence

Students experiencing short-term absences of three (3) consecutive days or fewer resulting in missed or late academic requirements must:

- Contact their instructor by phone or email prior to the academic requirement deadline or scheduled time and;
- Complete a **Student Declaration of Absence** form or provide alternate verification of the absence to their instructor or to the instructor's designate in-person, on-line through Brightspace, or via instructor e-mail within three (3) calendar days following the last day of absence.

Students who have recurring short-term absences and who exceed two submissions per course during a term are strongly encouraged to meet with a Faculty or Declared Major Advisor, or Faculty Program Coordinator. In cases of recurring short-term absences, instructors may request documentation to demonstrate a student has met with an Advisor or Coordinator and arrived at a course of action to manage the recurring absences before considering alternate academic requirement arrangements.

9. Long-term Absence

For long-term absences greater than three (3) consecutive days, students should contact their course instructor(s) or the instructor's designate within five (5) calendar days following the last day of absence. **The Student Declaration of Absence form will not be accepted for long-term absences.**

Students experiencing recurring or long-term absences are strongly encouraged to meet with a faculty advisor, Declared Major Advisor, or Faculty Program Coordinator. In some cases, instructors may also request that student discuss their situation with the Faculty of Science Associate Dean of Student Affairs, Dr. Patricia Laws: scieasst@dal.ca

University Policies and Statements

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit or e-mail the Indigenous Student Centre at 1321 Edward St or elders@dal.ca. Additional information regarding the Indigenous Student Centre can be found at: https://www.dal.ca/about/mission-vision-values/mikmaq-indigenous-relations.html

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: https://www.dal.ca/about/mission-vision-values/global-relations.html

Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. Additional academic integrity information can be found at: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (https://www.dal.ca/campus_life/academic-support/accessibility.html) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (https://www.dal.ca/campus_life/ssc.html).

Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: https://www.dal.ca/about/mission-vision-values/equity-diversity-inclusion-and-accessibility/about-office-equity-inclusion.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner - perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution. The full Code of Student Conduct can be found at: https://www.dal.ca/content/dam/www/about/leadership-and-governance/governing-bodies/code-student-conduct.pdf

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at: https://www.dal.ca/content/dam/www/about/leadership-and-governance/university-policies/fair-dealing-policy.pdf

Student Use of Course Materials

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.

Student Resources and Support

University Policies and Programs

- **Important Dates in the Academic Year (including add/drop dates):** http://www.dal.ca/academics/important_dates.html
- **Classroom Recording Protocol:** https://www.dal.ca/content/dam/www/about/leadership-and-governance/university-policies/class-recording-protocol.pdf
- **Dalhousie Grading Practices Policies:** https://www.dal.ca/content/dam/www/about/leadership-and-governance/university-policies/grading-practices-policy.pdf
- **Grade Appeal Process:** https://www.dal.ca/campus_life/academic-support/grades-and-student-records/appealing-a-grade.html
- **Sexualized Violence Policy:** https://www.dal.ca/content/dam/www/about/leadership-and-governance/university-policies/sexualized-violence-policy.pdf
- **Scent-Free Program:** https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html

Learning and Support Resources

- **General Academic Support – Advising (Halifax):** https://www.dal.ca/campus_life/academic-support/advising.html
- **General Academic Support – Advising (Truro):** https://www.dal.ca/campus_life/ssc.html
- **Student Health & Wellness Centre:** https://www.dal.ca/campus_life/health-and-wellness.html
- **On Track** (helps you transition into university, and supports you through your first year at Dalhousie and beyond): https://www.dal.ca/campus_life/academic-support/On-track.html
- **Indigenous Student Centre:** https://www.dal.ca/campus_life/communities/indigenous.html
- **Mi'kmaq and Indigenous Relations:** https://www.dal.ca/about/mission-vision-values/mikmaq-indigenous-relations.html
- **Elders-in-Residence** (The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit the office in the Indigenous Student Centre or contact the program at elders@dal.ca or 902-494-6803: https://www.dal.ca/about/mission-vision-values/mikmaq-indigenous-relations/elders-in-residence-and-traditional-knowledge-keepers.html
- **Black Student Advising Centre:** https://www.dal.ca/campus_life/communities/black-student-advising.html
- **International Centre:** https://www.dal.ca/campus_life/international-centre.html

- **LGBTQ2SIA+ Collaborative:** https://www.dal.ca/about/mission-vision-values/equity-diversity-inclusion-and-accessibility/about-office-equity-inclusion/community-specific-groups/lgbtq2sia-collaborative.html
- **Dalhousie Libraries:** http://libraries.dal.ca/
- **Copyright Office:** https://libraries.dal.ca/services/copyright-office.html
- **Dalhousie Student Advocacy Services:** https://www.dsu.ca/dsas?rq=student%20advocacy
- **Dalhousie Ombudsperson:** https://www.dal.ca/campus_life/safety-respect/ombudsperson.html
- **Human Rights and Equity Services:** https://www.dal.ca/about/mission-vision-values/equity-diversity-inclusion-and-accessibility/about-office-equity-inclusion/human-rights-and-equity-services.html
- **Writing Centre:** https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html
- **Study Skills/Tutoring:** http://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html
- **Faculty of Science Advising Support:** https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html

Safety

- **Biosafety:** http://www.dal.ca/dept/safety/programs-services/biosafety.html
- **Chemical Safety:** https://www.dal.ca/dept/safety/programs-services/chemical-safety.html
- **Radiation Safety:** http://www.dal.ca/dept/safety/programs-services/radiation-safety.html
- **Laser Safety:** https://www.dal.ca/dept/safety/programs-services/radiation-safety/laser-safety.html