

Behavioral Neuroscience
PSYO/NESC 3770.01, Winter 2025
Faculty of Science Course Syllabus
Department of Psychology & Neuroscience
January 6th - April 7th

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.

Instructor: Dr. Lucia Caceres lucia.caceres@dal.ca

Class Schedule: Held in person.

Location: LSC-Common Area C244

Lectures: Tuesdays and Thursdays: 1:05 – 2:25 pm.
Pdf lectures posted on Brightspace 24hrs before next class.

Test Schedule:

Unit tests: January 28th, February 25th, and March 18th.

Final Exam: Scheduled by Registrar between Apr. 9th – 26th.

Office Location: LSC2321

Office Hours: Mondays and Fridays, 11:30 am – 12:30 pm.

Teams link for office hours will be provided on the class calendar on Brightspace.

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LECTURE HOURS PER WEEK: 3 hrs.



Course Description

Behavioural neuroscience explores the neural and hormonal mechanisms underlying a variety of behavioural phenomena. The course focuses on neural correlates of social and emotional behaviour, motor behaviour and patterns, and behavioural toxicology processes (neurotoxins and endocrine disruptors).

Course Prerequisites

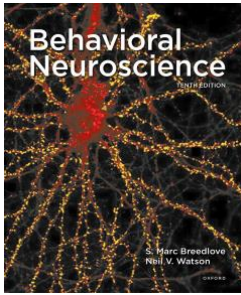
PSYO/NESC 2000 and PSYO/NESC 2470 or PSYO 2770

Course Materials

Exams will test knowledge based on the information taught in class.

Suggested popular textbooks and web links posted online on Brightspace are only to provide context and help fill in any gaps in background knowledge.

Recommended textbook (but not required)



Behavioral Neuroscience, 10th Edition
S. Marc Breedlove and Neil V. Watson
 ISBN-13: 978-0197161857
 Publication Year: 2023 | 848 pp.

Other Resources:

Essential Cell Biology (4th edition). Alberts, B., Bray, D., Hopkin, K., Johnson, A.D., Lewis, J., Raff, M., Robert, K., and Walter, P. Publisher: Garland Science. ISBN 0815345259.

All course material (videos, pdfs, ppt, etc.) will be posted on Brightspace

Course Assessment

Lecture Component: Tested material includes 1) lectures. Grades are based on **Assessment questions** (0.5% per lecture: 5%), and **4 Exams** (*Multiple choice, multi-select, interpreting images, short answer format. Content is cumulative*).

Marking Scheme	Weight	Due/Evaluation dates
Midterm I	25 %	January 28th, 2025
Midterm II	25%	February 25 th , 2025
Midterm III	25%	March 18 th , 2025
Final	20 %	TBD by Registrar
Assessment Lectures	5 %	Tuesday assignments due 5pm on Thursday Thursday assignments due 5pm on Saturday

Other course requirements

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.

3. Office hours: in-person or on Teams.

There are two ways to attend office hours. Either via teams or come drop by my office during the schedule time.

You can join office hours on Microsoft Teams. This software is available using your subscription to Office 365. Sign into login.microsoftonline.com with your @dal.ca email address and password. Once inside *Microsoft Office Home* you'll see an installer icon for Teams.

I will post the teams link for this course on the course calendar on Brightspace.

Course Objectives

This course will provide students with an introduction to behavior in the evolutionary, genetic, and cellular context.

The main objectives are covered within five themes:

- 1) Systemic description of behavior
- 2) Evolution of brain and behavior.
- 3) Life-span development of the brain and behavior.
- 4) The biological mechanism of behavior.
- 5) Application of behavioral neuroscience discoveries

Learning outcomes:

By the end of the course, students should be able to:

1. Describe historic and current methods of measuring behaviour.
2. Evaluate different methods of neuroscientific study in behavioural neuroscience.
3. Explain how neurobiological mechanisms relate to animal and human behaviour.
4. Understand and communicate important findings from primary research articles.

Key content

1. Mechanism of neurotransmitters and their receptor
2. Physiology of behavior
3. Evolutionary basis of behavior
4. Defining and measuring behavior

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.

Course Content: Tentative lecture topic guide

Week of...	Lecture	Lecture topic	
Jan.	7-9	1-2 <ul style="list-style-type: none"> Welcome and Scope of Behavioral Neuroscience. Evolution of the brain and behavior – Part I 	
	14-16	3-4 <ul style="list-style-type: none"> Evolution of the brain and behavior - Part II Biological Foundation of Behavior: Neurophysiology 	
	21-23	5-6 <ul style="list-style-type: none"> Biological Foundation of Behavior: Chemistry of Behavior. Life-span Development of the Brain and Behavior. 	
	28	-	Midterm I (Lectures 1- 6)
	30	7	<ul style="list-style-type: none"> Learning and Memory Part I
Feb.	4	8	<ul style="list-style-type: none"> Learning and Memory Part II
	6	-	In office midterm #1 review
	11-13	9-10	<ul style="list-style-type: none"> Biological Rhythms, Sleep and Dreaming Part I. Biological Rhythms, Sleep and Dreaming Part II.
	18-20	-	Winter Break
	25	-	Midterm II (Lectures 7 - 10)
	27	11	<ul style="list-style-type: none"> General principles of sensory processing, Touch and Pain
Mar.	4	12	<ul style="list-style-type: none"> Motor control and plasticity.
	6		In office midterm #2 review
	11-13	13-14	<ul style="list-style-type: none"> General principles of Somatosensory Part I. General principles of Somatosensory Part II.
	18		Midterm III (Lectures 11 - 14)
	20	15	<ul style="list-style-type: none"> Hormones and the Brain.
	25	16	<ul style="list-style-type: none"> Sex.
	27		In office midterm #3 review
Apr.	1-3	17-18	<ul style="list-style-type: none"> Homeostasis. Psychopathology.
	9-26	-	Final Exam Period (2-hrs Cumulative: Lectures 1-18)

Course Policies

Email Etiquette.

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/NESC 3770).

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.

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

1. **emailed to lucia.caceres@dal.ca.**
2. Student must submit an **SDA to Brightspace** only (do not email SDAs or drop SDAs off in person).

A completed SDA MUST include the following:

- a. The reason for the absence in the comment section (do not submit proper documentation).
- b. The exam that you missed. Ex. Midterm #1
- c. Signed and dated.
- d. **SDA needs to be submitted withing 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.

⇒ SDA forms are only valid for short-term absences.

Exam dates.

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.

Due dates. Each lecture ends with assessment questions. All Brightspace material will be available for viewing throughout the length of the course, but the assessment questions **must be completed at their assigned due dates.**

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

- A **Tuesday assessment questions** opens at 8 am and are **due at 5:00 pm on Thursday.**
- A **Thursday assessment questions** opens at 8 am and are **due at 5:00 pm on Saturday.**

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 after their due date). No assignments will be accepted after this end date has been reached.

- **Tuesday assessment questions** can be submitted with no penalty for up to **2 days** (48 hrs) **after its due date**, with an **End date/time: Saturday 5:00 pm**.
- **Thursday assessment questions** can be submitted with no penalty for up to **2 days** (48 hrs) **after its due date**, with an **End date/time: Monday 5:00 pm**.
- All assessment questions, whether they open on a Tuesday or Thursday, will **PERMANENTLY close for marks** on their **5:00 pm end date**.

Please don't leave assignments until the window is closing. **There are no late submission options and no marks after 5:00 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.

If you would like to claim extenuating circumstances (see below re: missed assignment) and ask to hand in a late assignment, your SDA form should cover most or all of the assignment window including the extra 2-days given after their due date.

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.

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 one (1) submission 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.

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/campus_life/communities/indigenous.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-dal/internationalization.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/about-dal/agricultural-campus/student-success-centre.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: <http://www.dal.ca/cultureofrespect.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/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

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/dept/university_secretariat/policies/academic/fair-dealing-policy-.html

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at: https://www.dal.ca/dept/university_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy-.html

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

1. Important Dates in the Academic Year (including add/drop dates):
http://www.dal.ca/academics/important_dates.html
2. Classroom Recording Protocol:
https://www.dal.ca/dept/university_secretariat/policies/academic/classroom-recording-protocol.html
3. Dalhousie Grading Practices Policies:
https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html
4. Grade Appeal Process: https://www.dal.ca/campus_life/academic-support/grades-and-student-records/appealing-a-grade.html



5. Sexualized Violence Policy: https://www.dal.ca/dept/university_secretariat/policies/health-and-safety/sexualized-violence-policy.html
6. Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

Learning and Support Resources

1. General Academic Support – Advising (Halifax): https://www.dal.ca/campus_life/academic-support/advising.html
2. General Academic Support – Advising (Truro): <https://www.dal.ca/about-dal/agricultural-campus/ssc/academic-support/advising.html>
3. Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness.html
4. 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
5. Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html
6. Indigenous Connection: <https://www.dal.ca/about-dal/indigenous-connection.html>
7. 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://cdn.dal.ca/content/dam/dalhousie/pdf/academics/UG/indigenous-studies/Elder-Protocol-July2018.pdf>
8. Black Student Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html
9. International Centre: https://www.dal.ca/campus_life/international-centre.html
10. South House Sexual and Gender Resource Centre: <https://southhousehalifax.ca/about/>
11. LGBTQ2SIA+ Collaborative: <https://www.dal.ca/dept/vpei/edia/education/community-specific-spaces/LGBTQ2SIA-collaborative.html>
12. Dalhousie Libraries: <http://libraries.dal.ca/>
13. Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>
14. Dalhousie Student Advocacy Services: <https://www.dsu.ca/dsas?rq=student%20advocacy>
15. Dalhousie Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html
16. Human Rights and Equity Services: <https://www.dal.ca/dept/hres.html>
17. Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html



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18. Study Skills/Tutoring: http://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html
19. Faculty of Science Advising Support: <https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html>

Safety

1. Biosafety: <http://www.dal.ca/dept/safety/programs-services/biosafety.html>
2. Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>
3. Radiation Safety: <http://www.dal.ca/dept/safety/programs-services/radiation-safety.html>
4. Laser Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety/laser-safety.html>