

Faculty of Science Course Syllabus

NESC / PSYO 3165

Neuroethology

Fall term 2023

Instructor: Dr. S. Adamo (sadamo@dal.ca) Office hours: By appointment, LSC 3324

TA: Dylan Miller (dy882407@dal.ca) Office hours: by appointment

Class Times: Fridays 11.30 am – 2.30 pm LSC P5257

Note that the class is in person, and attendance during labs is mandatory.

Before emailing, please check the syllabus and Brightspace announcements to see if the information you are seeking is already posted.

1. Course Description

Neuroethology explores how assemblies of neurons work together to produce behaviour. We will examine this question in simpler invertebrate animals.

NOTES: Some experiments involve live invertebrates. Students are required to handle invertebrates during these labs. If you are uncomfortable handling invertebrates, this is not the class for you.

2. Course Prerequisites

Nesc2570.03/Psyo2570.03 and either Psyo2000.03 or Nesc2000.03 or Biol2020.03.

The best preparation for this class is cellular neuroscience (Nesc 2570) and high school physics

3. Learning Outcomes

- Learn how to observe behaviour to produce reliable measurements
- Learn how to record the electrical activity of neurons
- Learn proper invertebrate handling techniques
- Learn basic data analysis
- Learn basic robotics
- Improve your writing skills by learning how to organize information and data while preparing your lab reports.

4. Course Materials

Neurons in Action (Simulation program from Oxford University Press)

Must be purchased online from Oxford University Press

Lab Manual - (electronic, found on course website)

Assigned readings and videos from the web.

Students are required to provide a bound lab book.

Brightspace: This site will be used for making announcements regarding the class, posting grades and the lab manual, etc. You are expected to check the class web page regularly for information updates. *If you have difficulties accessing or using Brightspace, please contact the help desk.*

5. Course Organization

5.1 Labs:

1. Computer simulations

Use computer simulations to study neural function

2. Neuroethology.

Learn how to quantify behaviour

Record electrical potentials from the nervous system of an Earthworm

3. Robotics

Use robots to understand the problems nervous systems must solve

5.2 Course Schedule:

Sept. 8: Lab introduction and Lecture 1 (Principles of Neuroethology)

Sept. 15: Lecture 2 (How to Observe Behaviour+Basic Data Analysis) + Outdoor Lab

Sept. 22: Lecture 3 (Electrophysiology)

Sept. 29: Virtual Neuroscience (Neurons in Action 1)

Oct. 6: Earthworm 1

Oct. 13: Earthworm 2 (Group A) Virtual Neuroscience (Neurons in Action 2) (Group B).

Oct. 20: Earthworm 2 (Group B) Virtual Neuroscience (Neurons in Action 2) (Group A).

Oct. 27: Lecture 3 – Neural Circuits and Connectomes.

Nov. 3 Robotics (Group A)

Nov. 10: Robotics (Group B)

Nov. 24: Neurons in Action 3

Dec 1: Robotics Report Due

NB: No final exam

5.3 Course Due Dates:

Oct. 5: Quiz 1 due

Oct. 12(A)/20(B): Quiz 2 due

Oct. 13: Neurons in Action 1 Due

Oct. 20: Earthworm 1 due

Nov. 2(A)/9(B). Quiz 3 due

Nov. 3: Earthworm 2 Report Due (Group A). NIA 2 Report Due (Group B)

Nov. 10: Earthworm 2 Report Due (Group B). NIA 2 Report Due (Group A)

Nov. 24: Robotics Report (Group A)

Dec. 1: Robotics Report (Group B) and NIA 3 Report Due
NB: No final exam

6. Course Grading Scheme

5%	Quiz 1 (on-line multiple choice)	Oct. 5
5%	Quiz 2 (on-line multiple choice)	Oct. 12
10%	Neurons in Action 1	Oct. 13
15%	Earthworm 1 Lab Report	Oct. 20
5%	Quiz 3 (on-line multiple choice)	Nov. 2
10%	Neurons in Action 2	Nov. 3/10
15%	Earthworm 2 Lab Report	Nov. 3/10
20%	Robotics Lab Report	Nov. 24/Dec. 1
10%	Neurons in Action 3	Dec. 1
5%	Lab Skills	

Students must obtain 70% or better on Quizzes to participate in the associated lab.

6.1 Lab Report Grading Scheme

Introduction	2/10
Methods	1/10
Results	2/10
Discussion	3/10
Conclusions	1/10
References	1/10

Please see class website (contents section) for a discussion of what is expected in each section of the lab report.

Labs can be submitted electronically or as a hard copy.

6.2 Missed Lab Policy

Missing a lab period requires a declaration of absence form. Regardless of the reason for the absence, the lab report for that lab must still be written up. Under these circumstances, students will be allowed to borrow results from another student or from the TA.

There are no make-up labs.

6.3 Missed Quizzes

To ensure proper handling of the earthworms, students cannot participate in Earthworm 1 and 2 without completing the Quizzes 1 and 2. To ensure safe use of the robots, students cannot participate in the robotics lab without completing Quiz 3. Labs missed for this reason will result in a 2 mark deduction from the Lab Skills mark (for each lab missed, to a maximum of 5 marks) and a 0 on the quiz. The student will need to borrow

data to write up the lab they missed. The quizzes, based on the lab manual, will be opened at the start of class, giving students multiple weeks to complete the on-line quiz.

6.4 Late Labs Reports and Neurons in Action problem sets.

Students have 3 days after the due date to hand in assignments without penalty. Late penalties are 2% per day for the first 5 days after the grace period, then 1% per day thereafter to a maximum of 25%. Late assignments will be accepted until the end of the first week of final exams for the fall term.

6.5 Lab Skills Mark

The Lab Skills mark will be determined by weekly performance during the lab class. Students will be graded for promptness, organization, ability to focus during the lab and technical skill.

6.6 Course Grading Scheme

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

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

7. Course Policies

7.1 Recording Lectures

Students must seek permission from the instructor before recording any portion of a lecture or lab in any format - audio, audio-visual, visual, transcription, etc. Even if permission is given, under no circumstances are such recordings to be shared, posted online, or distributed in any other way; recordings must be destroyed by the end of term. Permission to record lectures/labs will generally only be granted in cases of documented disability that explicitly requires this form of assistance.

7.2 Distributing Course Materials

Students do not have permission to revise, modify, share, post on-line, or redistribute in any manner - electronic or otherwise - any of the lecture or lab materials.

7.3 E-mail Etiquette

Students often don't appreciate how many emails their professors and TAs receive in a single day, most of which require a response. E-mails constitute professional correspondence and the informal messages students may use to communicate with their friends are not appropriate in this context.

We are very happy to hear from you and will endeavour to provide a helpful response within a maximum of three *working days* of receipt. You can facilitate this by making sure that you:

- Read the syllabus and website to determine whether the information you require is already available
 - We may *not* respond to emails that ask about information contained in the course syllabus or on the course website.
 - We will not respond to emails that ask whether 'anything important' was or will be covered during an absence.
- Enter the course number in the subject line: Nesc 3165
- Provide a professional salutation ("Hey!" is not appropriate)
- Write in full, grammatically correct sentences
 - Your professors do not want to receive text-speak
- Proof-read your email message to be sure that it is clear and provides all pertinent information
 - Avoid the time-wasting back-and-forth that happens when a respondent must request more information before being able to act
- Do not write to request an exception to the syllabus
 - All students are subject to all the rules as outlined in this course syllabus and no exceptions will be made to any class policies under any circumstances
- Provide a professional closing
- If you have already sent an email on the same topic within the last three *working* days, do not re-send your message
- Include your FULL name and Dal student ID

7.4 Texting/Email During Labs

- Students sometimes don't realize how distracting their texting/E-mailing can be to those around them. You are requested to please show the courtesy of putting away your phones, turning off your email, etc. during the lectures and labs. The labs, in particular, require your complete attention.
- Because of animal care regulations and safety concerns, students who are distracted by electronics during the lab will be asked to leave. Students who are asked to leave will be required to make an appointment to meet with me in person before being allowed to resume lab attendance. Missed labs for this reason will result in a loss of marks for lab participation.

7.5 Academic Integrity

- Students are expected to work independently on their assignments, unless they are told explicitly that they can work together as part of a group. Otherwise, the assignments should be entirely the student's own work (e.g. the use of large language models is not allowed).
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University Policies and Statements

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, and the many other cultures that have contributed to Nova Scotia.

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

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: <https://libraries.dal.ca/>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: <https://dsu.ca/dsas>

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

Dalhousie COVID-19 information and updates: <https://www.dal.ca/covid-19-information-and-updates.html>