

Neuronal Organization Laboratory Syllabus

Department of Psychology and Neuroscience

PSYO/NESC 3371 Fall 2023

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.

Course Instructor(s)

Name	Email	Office Hours
Janusz Borycz	jborycz@dal.ca	Monday 12:30 – 2:00 PM at PSYCH 2539
Jolanta Borycz	jaborycz@dal.ca	By appointment

Course Description

Introduction to several laboratory techniques used in contemporary neuroscience. Students work under supervision individually or in groups of 2 or 3 in regular labs that introduce neuroanatomical analyses using the following: Golgi impregnation, immunocytochemistry, dye-tracing of connections, electron microscopy of the retina, and neurotransmitter determinations using HPLC.

Course Prerequisites

PSYO 2000.03 or NESC 2007.03, PSYO 2470.03/NESC 2470.03 and PSYO 2570.03/NESC 2570.03

Student Resources

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/dept/university_secretariat/policies/academic/classroom-recording-protocol.html

Dalhousie Grading Practices Policies:

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

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/dept/university_secretariat/policies/health-and-safety/sexualized-violence-policy.html

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/about-dal/agricultural-campus/ssc/academic-support/advising.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

Indigenous Connection: <https://www.dal.ca/about-dal/indigenous-connection.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://cdn.dal.ca/content/dam/dalhousie/pdf/academics/UG/indigenous-studies/Elder-Protocol-July2018.pdf>

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

South House Sexual and Gender Resource Centre: <https://southhousehalifax.ca/about/>

LGBTQ2SIA+ Collaborative: <https://www.dal.ca/dept/vpei/edia/education/community-specific-spaces/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/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Human Rights and Equity Services: <https://www.dal.ca/dept/hres.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>

Course Structure

Course Delivery

In-person lab class

Lectures

No lectures – lab only course

Laboratories

3-hour lab weekly; 3 separate sections (Tue 2:35-5:25 PM; Thu 11:35 AM-2:25 PM; Fri 8:35-11:25 AM)

Location - Psychology 4245

Course Materials

No textbook(s) – the manual will be provided. Additional material e.g., Power Points, notes, demonstrations of lab procedures and pdf copies of scientific articles will be posted on Brightspace.

Assessment

Assessment	Percent of final grade	Date
Pre-lab Quizzes (8 quizzes worth 2.5% each – no quiz in 1 st week and presentation weeks)	20%	Ongoing
Presentation 1	20%	Tue-Fri, Oct 4-6
Presentation 2	20%	Tue-Fri, Nov 1-3
Final Exam	35%	TBA (exam period)
Attendance and work quality	5%	Ongoing

The pre-lab weekly quizzes (8), start from week 2 and each one will be posted on Brightspace at 9 am a day before scheduled class and will be available until class starts the next day. Each pre-lab quiz must be completed before the lab so no make-up for quizzes. They are based on handout/power points/video clips posted on Brightspace and will help you to prepare for the current class.

Presentations will be held in class using the class monitor. Each student will have 10 min for the presentation which will be followed by a 5 min (max) discussion. The presentation grade will be judged based on presenting the results (50%) and ability to answer questions related to the subject (50%). Exceptions from presentation can be obtained and the student will write a full report instead (Introduction, methods, results, and discussion) by the presentation due date. There are no alternative dates for presentations.

Other course requirements

Watching/reading of material that will be posted on Brightspace is essential for writing lab quizzes, preparing the presentation as well as for writing the final exam.

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)	

Course Policies on Missed or Late Academic Requirements

Obligatory are two presentations and an exam. Without these components an “Incomplete” grade will be issued. Only one of all lab classes can be missed if the Declaration of Absence is sent no later than 24 hours from the beginning of missed lab. Missing more than one lab class will result in an “Ill” grade. Classes are full so there is no possibility to make up the class on a different day of the week.

There is no makeup for presentations. Students who miss their presentation are required to submit the Student Declaration of Absence no later than 24 hours after their presentation time. Instead of presentation they are required to write a full lab report. The deadline for reports will be decided in person on a case-by-case basis. Forgetting to submit the Declaration of Absence will result in grade 0 assigned for that presentation. There is a penalty for late report submission: 10% for the first day and 5% for each following day.

There are 8 pre-lab quizzes. They are not mandatory to pass the course but if you do not complete them you will lose % from your final grade.

Missed final exam: Refer to the calendar. The makeup for the final exam will be announced at a later date.

Course Policies related to Academic Integrity

When collecting your data, you will frequently work in teams. However, the presentation should be done independently. Using generative AI (e.g., ChatGPT) is permitted when preparing your presentations but you should have a solid knowledge of material for answering the questions.

Learning Objectives

After completing the course, you should have a good knowledge of retinal organization, structure of muscles and neuromuscular junctions as well as knowledge of insect sensory system. The skills you will develop include tissue dissection, fixing, labeling using histochemistry and immunohistochemistry methods, tissue sectioning, using different types of light and

electron microscope. The other skills include cell counting and mapping their distribution in the retina.

Course Content

Tentative Course Schedule (Fall 2023)

Class	Date	Topic
1-1	Tue-Fri, Sep 5-8	Introduction. Dissecting and fixing crayfish muscles then adding Phalloidin-TRITC.
1-2	Tue-Fri, Sep 12-15	Mounting, viewing, and photographing preps stained with Phalloidin-TRITC and Hoechst Blue.
1-3	Tue-Fri, Sep 19-22	Dissecting and fixing larvae of <i>Lucilia sericata</i> . Staining larval fillet preparations with anti-synapsin, anti-5-HT and other neuronal and glial antibodies.
1-4	Tue-Fri, Sep 26-29	Mounting, viewing, and photographing preps stained by immunocytochemistry.
1-5	Tue-Fri, Oct 4-6	Presentation 1
2-1	Tue-Fri, Oct 10-13	Watching the video of dissection of rabbit's eye to make a retinal wholemount. Dissection of sheep's eye.
2-2	Tue-Fri, Oct 17-20	Nissl staining of wholemount preparations made in previous week. Drawing and photographing the Golgi-stained retina cells.
2-3	Tue-Fri, Oct 24-27	Making retinal cells count. Processing the pictures of Golgi-impregnated retinas and semithin retina sections stained with toluidine blue.
2-4	Tue-Fri, Oct 31- Nov 3	Making the ganglion cell density map and preparing figures for Presentation 2.
2-5	Tue-Fri, Nov 1-3	Presentation 2
3-1	Tue-Fri, Nov 7-10	Cutting thick plastic sections of <i>Lucilia sericata</i> brain. Making histamine standards and samples for HPLC.
	Nov 13-17	Fall Study Break – no classes
3-2	Tue-Fri, Nov 21-24	Photographing sectioned <i>Lucilia</i> brain. Processing HPLC data.
3-3	Tue-Fri, Nov 28 - Dec 1	Classes wrap-up.
	Wed, Dec 6	Classes end
	To be announced	Final Exam (exam period Dec 8-19)

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.