Independent Research I, II, and III
Syllabus
Department of Biology

BIOL 4806.03, BIOL 4807.03, BIOL 4809.03

MARI 4806.03, MARI 4807.03, MARI 4809.03

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 Coordinator

Name	Email	Office Hours
Patrice Côté	patrice.cote@dal.ca	By Appointment

NOTE: text in **red** indicates new syllabus components for the 2023-2024 academic year.

Course Description

Students conduct supervised, independent research in Biology. The student and faculty supervisor together develop a course outline, with a proposal for original research and the method of evaluation, including a formal research paper. Outline must be approved by the department before the student is permitted to register.

Course Prerequisites and Registration Process

The signature required to register can only be given by the Chair of the Biology Undergraduate Curriculum Committee or their designate. This course is intended for Biology or Marine Biology students in their fourth year of study. The course outline must be submitted for approval no later than one week after the start of the term in which the student wishes to register. For forms and more information see https://www.dal.ca/faculty/science/biology/programs/undergraduate.html

Learning Objectives

These courses provide unique opportunities outside the regular classroom for upper-level students to engage in independent research. The student should do some initial exploration of a research area or question, find a supervisor, and together prepare a draft proposal of the project. Supervisors are usually professors at Dalhousie who conduct research in an area related to the research question. The finalized proposal, with detailed assessment components and the completed registration form (signed by both the supervisor and the student) are then submitted to the Chair of the Biology Undergraduate Curriculum Committee. The proposal is then reviewed and approved or not, or approved after modification.

Common Formats of the course include: (i) an original research project, similar to that involved in Honours research; and/or (ii) directed writing of an original review paper.

Regulations:

- The student(s) should normally be in their 4th year of study or equivalent and have a minimum of 75 Earned Credit Hours including at least 36 credit hours in Biology or Marine Biology courses.
- Students are responsible for finding a supervisor in their field of interest.
- The supervisor is usually a faculty member at Dalhousie University and usually holds a PhD in a Biological discipline.
- Proposed supervisors that are not from Dalhousie must hold a PhD, MD or equivalent and must be a faculty member in an accredited university (a C.V. will be required). In some cases, an 'internal supervisor' (ie. a faculty member from the Dalhousie U. Department of Biology with expertise in the proposed field of study) may be required. The need for an internal supervisor is assessed by the course coordinator on a case-by-case basis. If a supervisor from outside Dalhousie is being considered, please contact the course coordinator as soon as possible, as the approval process may take longer.
- Material prepared for an Independent Research course cannot be used in an Honours thesis.
- Material prepared for an Independent Research course cannot be derived from work performed as a routine expectation of employment.
- Independent Research II and III: It is possible to undertake more than one Independent Research course with the same supervisor, although students are encouraged to explore other labs for new project opportunities. If a student wishes to undertake another term with the same supervisor, the new project must be *entirely different* from the previous project (different objectives, hypotheses, and techniques).

Application Deadline:

- The proposal and registration form signed and dated by both the student and the supervising Professor must be received by the Chair of the Biology Undergraduate Curriculum Committee NO LATER THAN ONE WEEK AFTER THE START OF CLASSES for the term in which the course is to

begin. The student is responsible for ensuring that these materials reach the Chair of the Curriculum Committee by the appropriate deadline.

- Once the proposal is approved, the Curriculum Committee Chair will set up through the Banner system, permission to register in the course and notify the student that he or she may now register in the course.

The Course Numbers:

BIOL/MARI 4806.03 - the first Independent Research course taken (any semester)

BIOL/MARI 4807.03 - the second Independent Research course taken (any semester)

BIOL/MARI 4809.03 - the third Independent Research course taken (any semester)

How to apply for an **Independent Research course** in the Biology Department:

The student, with approval from their supervisor must submit the following separate documents.

1) Completed **registration form** (last page of this syllabus).

2) Proposal – Written by the student, this should be approximately two pages long and include the (i) title of your project (ii) background information about the subject including in text citations and end references (iii) objective(s) of your research project (iv) methods used (v) and why this research is significant.

3) Details of **Assessment** – this is a description of how the student will be evaluated, including deadlines for submission of course assignments, the value for each part being assessed, policies on missed or late academic requirements, and policies related to academic integrity.

Course Assessment

Assessment criteria of independent research students are flexible but must be agreed upon by the student and supervisor by the time of registration. It is important that the assessment criteria be clear from the outset (see **Expectations for Undergraduate Research**)

Mandatory components include:

- At least one deadline which should be met by mid-term.
- A final report worth no less than 30% of the final grade.

The assessment page should also include a statement of how the student and professor will interact, (e.g. one or two-hour meetings held biweekly).

Completion Deadline:

- **STUDENT:** A copy of the final report of the project should be submitted by email by the student to the Chair of the Biology Undergraduate Curriculum Committee by the <u>END OF THE FINAL WEEK OF CLASSES</u> for the term in which the student is enrolled.
- **SUPERVISOR:** The final letter grade for the student should be submitted by the supervisor to the Chair of the Biology Undergraduate Curriculum Committee <u>NO LATER THAN TWO WEEKS AFTER THE END OF CLASSES</u> for the term in which the student is enrolled.
- An Incomplete Grade (INC) will be assigned to students for whom no grade is received by the deadline specified in the Academic Regulations.

IMPORTANT

Out of fairness for everyone, the final report deadline will be strictly enforced. Only extreme extenuating circumstances can justify a deadline extension and will only be granted if a request, with support from the supervisor, is made at least one week before the deadline. "Extreme extenuating circumstances" can include prolonged incapacitating illness (over one week), death of a close family member, or other exceptional circumstances of a similar nature. Issues with the research project is not an acceptable justification.

Expectations for Undergraduate Research

Our **philosophy** regarding Independent Research is that – as the course name suggests – students should have a high degree of independence and autonomy with respect to their research projects. To that end, we stress that the key to success in Independent Research is the relationship that the student develops with his or her supervisor. With the supervisor's guidance, the student is responsible for pursing all aspects of their research project. Students learn how to formulate hypotheses and predictions and how to prepare a project proposal. They also learn how to conduct laboratory or field research, how to collect and analyse data, and how to write a structured final report. These skills are all learned directly from their research experience, which means that the supervisor is responsible for mentoring the student. The student is expected to take command of their experience and seeks out answers, but of course under the wing of a supervising professor. The course coordinator, Patrice Côté, is available to advise the student too, or they can suggest additional or alternate avenues that the student might explore to find answers. We believe that this kind of **independent but supervised** approach to research fosters critical independent thought, problem solving, autonomy and is the best way to prepare students for a career involving research or further studies.

Because the student-supervisor relationship is fundamental to the research process, the department feels it is important to outline certain expectations for undergraduate research. If, at any time, either the student or supervisor(s) do not feel the below expectations are being met, they are encouraged to contact the Chair of the Biology Undergraduate Curriculum Committee, Patrice Côté.

- Students can expect to work closely with their supervisors in defining a project proposal that is appropriate given the time and resource constraints.

- Students can expect to work closely with their supervisors in defining assessment components that will fairly evaluate progress at various stages of the project.

- Students can expect to have regular communication with their supervisors to receive help with problem solving, and to receive regular feedback on assessment components and as the final report is being written.

- Students can expect to have a clear understanding of what is expected in delivering the assessment components, including the final report (e.g. expected length and format, acceptable methodology, validity of topic) and to receive a thorough and fair assessment of their work, with explanations of any criticism.

- Students are expected to give serious and considered attention to the advice from their supervisor(s) concerning what they regard as essential changes in the research and/or final report.

- Students are expected to produce a final report that is essentially their own work and to acknowledge direct assistance or borrowed material from other scholars or researchers.

- Students can expect their efforts to be focused on their research project. While students may choose to participate in other projects within the research lab, they should not be diverted from the timely completion of their thesis and other course obligations.

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

Except for the Final Report, the supervisor shall set the policies on missed or late academic requirements for all assessment components and these policies will be included with the Assessment Components when they are submitted with the Project Proposal and Registration Form.

The penalty for the late submission of the Final Report (submitted after midnight on the deadline date) is 5% of the Report grade, per day late.

Course Policies related to Academic Integrity

Similarly to Course Policies on Missed or Late Academic Requirement, with the exception of the Final Report, the supervisor shall set the policies related to academic integrity for all assessment components and these policies will be included with the Assessment Components when they are submitted with the Project Proposal and Registration Form. Supervisors should clarify if and how plagiarism software (e.g., URKUND) will be used, their expectations around generative AI and large language models (e.g., ChatGPT), and indicate if they have any other academic integrity-related requirements.

While the supervisor is expected to provide feedback during its development, the Final Report is expected to be the student's own work. Plagiarism is not acceptable and plagiarism detection software may be used by the course coordinator. The use of generative AI and large language models is discouraged for the composition of the Final Report. However, if ChatGPT (or similar software) is used, the student shall declare at the beginning of the Report that it was used, that the supervisor has approved its use, and they will indicate which sections were produced with the assistance of the technology.

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.

Faculty of Science

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/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

Independent Research I, II, and III
REGISTRATION FORM

Semester: □ **Fall 2023**   □ **Winter 2024**   □ **Summer 2024 (section: _____)**

For the <u>Student</u>:

I have read the information and regulations for the Independent Research courses.

I agree to abide by the regulations for Independent Research courses including the requirement that I submit a copy of my final report to the Chair of the Biology Undergraduate Curriculum Committee by the end of classes through the Brightspace course site.

I have read and agree to the provisions of the '**Expectations for Undergraduate Research**' statement.

I understand that failure to follow the regulations will result in an INC grade being awarded for the Independent Research course, and that such grades are assigned a grade point value of 0.0.

Student Name and Banner Number: _____

Student's Signature: _____ Date: _____

Student's e-mail address: _____

For the <u>Supervisor</u>:

I have read the information and regulations for Independent Research course.

I have read and agree to the provisions of the '**Expectations for Undergraduate Research**' statement.

I agree to submit the details of the assessments and a final letter grade to the Chair of the Biology Undergraduate Curriculum Committee no later than two weeks after the end of classes.

Please register the student in:

□ BIOL 4806.03 Independent Research I   □ MARI 4806.03 Independent Research I
□ BIOL 4807.03 Independent Research II   □ MARI 4807.03 Independent Research II
□ BIOL 4809.03 Independent Research III   □ MARI 4809.03 Independent Research III

Supervisor's Name: _____ Department: _____

University: _____ e-mail address: _____

Supervisor's Signature: _____ Date: _____

Biology Department Signature (Curriculum Chair): _____ Date: _____