

**Faculty of Science Course Syllabus
Department of Biology**

*BIOL 2004: Diversity of Plants and Microorganisms
Winter 2023*

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.

We acknowledge the histories, contributions, and legacies of the African Nova Scotian people and communities who have been here for over 400 years.

Lecturer/Lab Instructor: *Ellen Jamieson*; ellen.jamieson@dal.ca; LSC 2124;

office hours: drop-in or by appointment

Lectures: *Tuesday & Thursday 1:05-2:25pm; Sir James Dunn Building Rm 117*

Laboratories: *Life Sciences Centre Rm B5009 (odd numbered sections) & B5012 (even numbered sections)*

| Lab Section | Room | Day | Time | Teaching Team |
|--------------------|-------------|------------|---------------------|----------------------|
| B01 | 5009 | Monday | 2:35 pm – 5:25 pm | Ellen & Tessa |
| B02 | 5012 | Monday | 2:35 pm – 5:25 pm | Ellen & Abbie |
| B03 | 5009 | Tuesday | 10:05 am – 12:55 pm | Ellen & Patrick |
| B04 | 5012 | Tuesday | 10:05 am – 12:55 pm | Ellen & Anna |
| B05 | 5009 | Tuesday | 3:05 pm – 5:55 pm | Ellen & Jacqueline |
| B06 | 5012 | Tuesday | 3:05 pm – 5:55 pm | Ellen & Jensen |
| B07 | 5009 | Wednesday | 2:35 pm – 5:25 pm | Ellen & Zaina |
| B08 | 5012 | Wednesday | 2:35 pm – 5:25 pm | Ellen & Kendra |
| B09 | 5009 | Thursday | 3:05 pm – 5:55 pm | Ellen & Liz |
| B10 | 5012 | Thursday | 3:05 pm – 5:55 pm | Ellen & Eden |

****Note: Students are expected to attend the lab section for which they are registered.***

Course delivery: *In-person lectures and labs. Lectures will be recorded.*

Course Description

Introduces the main domains of plant, fungal, and microbial life, based on modern phylogenetic taxonomy. Examines the diversity, structure, physiology, and ecology of non-animal life forms. Reviews the origins of the main lineages of living things - Archaea, Eubacteria and Eukaryota, as well as the main groups of eukaryotes

Course Prerequisites

A grade of C or higher in BIOL 1010.03 or (BIOL 1020.03, BIOL 1030.03, BIOA 1002.03, SCIE 1507.09) and BIOL 1011.03 or (BIOL 1021.03, BIOL 1031.03, BIOA 1003.03, SCIE 1506.09).

Course Objectives & Learning Objectives

The biology department has created a [curriculum map of the courses it offers](#).

On that page if you click on the courses link, you will come to a list of all the courses offered by the biology department. Clicking on any of the individual courses, leads to a course page, with a map for the course, illustrating what courses are needed to take the course and what subsequent courses require the course of interest as a prerequisite.

Below the [map for BIOL2004](#), you will find a list of assumed learning outcomes, these are the skills and topics a student is expected to know at the start of the course. Following this list is a second list of student learning outcomes, these are the topics and skills a student is expected to learn during the course.

Required Course Materials

1. Slonczewski JL, Foster JW, Zinser ER. 2023. Microbiology An Evolving Science. 6th ed. New York: W.W. Norton & Company.
2. Evert RF, Eichhorn SE. 2013. Raven Biology of Plants. 8th ed. New York: W.H. Freeman and Company.
 - Textbooks are available electronically from the [bookstore](#). You will purchase the book through the bookstore and access the book through the Willo platform on Brightspace.
 - The textbooks will also be placed on course reserve at the Killam Library.
 - Two copies of Microbiology, An Evolving Science. 4th ed. One on 2-hour loan, one on 24-hour loan.
 - One copy of Microbiology, An Evolving Science. 3rd ed. on 24-hour loan
 - One copy of Raven Biology of Plants. 8th ed. on 2-hour loan
 - One copy of Introduction to Botany on 24-hour loan
3. Supplementary course notes: There are supplementary course notes for parts of the microorganisms section. These will be available to you on Brightspace.
4. Laboratory Manual.
 - The Lab Manual is available from the bookstore.
5. Lab Coat
 - Dalhousie university policy states that all students will wear a lab coat when attending a laboratory session with potential hazards. Lab coats will be required for the weekly in-person labs. Lab coats are available at the bookstore and can be transported to and from lab in a plastic bag.
6. Course Brightspace page: BIOL 2004 – Diversity of Plants & Microorg – Winter 2023

Optional Course Materials/Resources

1. Knisely K. 2005. A student handbook for writing in biology. 5th ed. Sunderland: Sinauer Associates. 237 p. (Dalhousie Killam call number QH 304 K59 2017)
2. LibGuide: The Dalhousie University Science Librarian, Gwendolyn MacNairn, has put together a [subject guide for Biology-2000-Level](#). On this page you will find links to the key databases, relevant books, writing guides, and other useful research tools.

Course Schedule & Content

| Week | Date | # | Lecture Topic | Laboratory Topic |
|------|--------------------|----------|--|--|
| 1 | Jan. 10 Jan. 12 | 1 2 | Introduction to microorganisms: The prokaryote cell The prokaryote cell continued | No Labs |
| 2 | Jan. 17 Jan. 19 | 3 4 | Metabolic diversity in prokaryotes Bacterial diversity 1 | Lab 1: Introduction, Lab Safety, Unknown Hand Bacteria, and Unknown Fungi (Part 1), Micro Techniques & Microscopes |
| 3 | Jan. 24 Jan. 26 | 5 6 | Bacterial diversity 2 Bacterial diversity 3 | Lab 2: Micro Techniques Practice, Bacterial Staining, Unknown Hand Bacteria (Part 2) |
| 4 | Jan. 31 Feb. 2 | 7 8 | Archaea Introduction to microbial eukaryotes (cells and evolution) | Lab 3: Micro Techniques Practice Unknown Hand Bacteria (Part 3) |
| 5 | Feb. 7 Feb. 9 | 9 10 | Microbial eukaryotes diversity 1: Mostly microalgae Microbial eukaryotes diversity 2: Mostly protozoa | Lab 4: Bacteriophage (Part 1) & Fungi (Part 2) |
| 6 | Feb. 14 Feb. 16 | 11 12 | Fungi Macroalgae | Lab 5: Bacteriophage (Part 2) & Fungi (Part 3) |
| 7 | Feb. 21 Feb. 23 | | Study Break: No Class Study Break: No Class | No Labs |
| 8 | Feb. 28 Mar. 2 | 13 14 | Introduction to Plants Bryophytes (i) | Lab 6: Cyanobacteria, Protists, Microalgae & Macroalgae |
| | Mar. 3 | | ** Microorganism Test** Outside of class time: 6:00-8:00pm, ROWE 1028 | |
| | Mar. 7 Mar. 9 | 15 16 | Bryophytes (ii), Seedless vascular plants (i) Seedless vascular plants (ii) | Lab 7: Introduction to Plants & Bryophytes |
| 10 | Mar. 14 Mar. 16 | 17 18 | Gymnosperms (i) Gymnosperms (ii) | Lab 8: Seedless Vascular Plants |
| 11 | Mar. 21 Mar. 23 | 19 20 | Angiosperms (i) Angiosperms (ii) | Lab 9: Gymnosperms |
| 12 | Mar. 28 Mar. 30 | 21 22 | Diversity of flowering plants (i) Diversity of flowering plants (ii) | Lab 10: Angiosperms |
| 13 | Apr. 4 Apr. 6 | 23 24 | Primary plant body: roots, leaves, stems The private life of plants/Programmed cell death in plants. | Plant Lab Exam |

Course Assessment

| | Assessment | Weight (% of final grade) | Due Date |
|---------------|---|---------------------------------|---|
| Lecture (56%) | Test 1 (Microorganism Material) | 28 | Friday, March 3 rd 6:00-8:00pm Rowe 1028 |
| | Test 2 (Plant Material) | 28 | TBA: During regular exam period |
| Lab (44%) | <i>*Lab Safety Rules Quiz (required 100% to access other quizzes)</i> | — | Monday, January 16 th at 11:59pm |
| | Microorganism Quizzes (Brightspace) | 2/quiz x4 = 8 | Due Mondays at 11:59pm Micro Quiz 1: January 23 rd Micro Quiz 2: January 30 th Micro Quiz 3: February 6 th Micro Quiz 4: February 13 th |
| | Slides | 0.25/slide x7 = 1.75 | Reference Gram stain: Lab 2 (Jan. 23-26) Spore stain: Lab 2 (Jan. 23-26) Negative stain: Lab 2 (Jan. 23-26) Hand Gram stain 1: Lab 2 (Jan. 23-26) Hand Gram stain 2: Lab 3 (Jan. 30-Feb. 2) Unknown Gram stain: Lab 3 (Jan. 30-Feb. 2) Pair of Fungi slides: Lab 4 (Feb. 6-9) & Lab 5 (Feb. 13-16) |
| | Plates | 0.25/plate x7 = 1.75 | Hand Streak Plate: Lab 2 (Jan. 23-26) Unknown EMB streak plate: Lab 3 (Jan. 30-Feb. 2) Unknown Lawn plate: Lab 3 (Jan. 30-Feb. 2) Bacteriophage Plate 1: Lab 4 (Feb. 6-9) Bacteriophage Plate 2: Lab 4 (Feb. 6-9) Bacteriophage Plate 3: Lab 5 (Feb. 13-16) Fungi Subculture: Lab 4 (Feb. 6-9) |
| | Bacterial Unknowns | 2 | Week of Monday, February 6 th |
| | Bacteriophage Assignment | 1.5 | Week of Monday, February 27 th |
| | Fungi Report | 4 | Friday, March 3 rd |
| | Protist Drawings | 3 | Monday, March 6 th |
| | Plant Quizzes (Brightspace) | 2/quiz x5 = 10 | Bryophyte Quiz: Monday, March 13 th S.V.P. Quiz: Monday, March 20 th Inside Gymnosperm Quiz: Monday, March 27 th <i>*Outside Gymnosperm Quiz: Sunday, April 2nd</i> Angiosperm Quiz: Monday, April 3 rd |
| | Plant Natural History Pages | 1/page x3 = 3 | Bryophyte Page: Monday, March 13 th Seedless Vascular Plant Page: Monday, March 20 th Gymnosperm Page: Monday, March 27 th |
| | Lab Exam | 9 | April 3 rd – 6 th |

Lecture Tests: There will be two lecture tests. Test 1 will be based on the Microorganism material and will be held outside of class time on Friday, March 3rd from 6:00-8:00pm in Rowe 1028. Test 2 will be based on the Plant material and will be scheduled by the registrar's office during the April exam period. Each test is worth 28% of your final grade.

Quizzes: The four microorganism quizzes and four plant quizzes, with the exception of the outside gymnosperm quiz, will be delivered online through Brightspace. Each quiz will consist of ten questions, each worth 0.2 marks, for 2 marks per quiz. There will be 3-4 lecture questions and 6-7 lab questions per quiz. Quizzes are scheduled on select Mondays (see course schedule) and will open at 12:01am and close at 11:59pm. The quiz questions will only pertain to material covered in lecture and lab the week before except for the first quiz which will cover the first two weeks of lecture and first lab. You will have one attempt at the quiz. Once you open the quiz you will only have 15 minutes to complete the quiz.

Assignment Submission: Both individual and group assignments will be submitted to Brightspace Dropboxes and are due no later than 11:59pm on the associated due dates. Assignments must be submitted as PDF files. Pay close attention to assignment due dates as some are Mondays, some are Fridays, and some depend on your lab section. If you are submitting an assignment on behalf of a group, please ensure that the names of all group members are recorded on the submission.

Lab Exam: A lab exam will be held in the last laboratory session in the week of April 3rd – 6th. Students are expected to write their lab exam in their registered lab section. The lab exam will be two hours in duration and will cover all plant lab material. No microorganism material will be on the test. The lab exam will be an untimed station exam, consisting of identification, definitions, and short answer questions. Students are expected know and spell the names of the taxa covered in the labs.

Course Policies

Assignments: All work submitted for credit must be completed independently, unless designated as a group project. Assignments are to be submitted before 11:59pm on the due date listed in the outline of Course Assessments.

Group work: During labs, you are expected to collaborate respectfully and responsibly with other students in small groups. There is one group submission in BIOL2004 (Bacterial Unknowns). Group work should be peer-reviewed prior to submission and all members of the group will be assigned the same grade.

Late Assignments: If you cannot submit an assignment due to illness or other valid reasons, please contact Ellen, and the appropriate arrangement will be made. Technical issues (e.g., forgetting to submit an assignment, submitting the wrong file, computer crashes, etc.) are not valid reasons for an extension. Late assignments are not accepted.

Absences: If you miss in-person assessments or instructional time due to illness or other exceptional circumstances, contact Ellen. Appropriate arrangements will be made based on the circumstances. Student Declaration of Absence (SDA) forms are not accepted in this course.

- Lectures will be recorded and posted on Brightspace, so if you miss a lecture, you can review the material online.
- If you cannot write a lecture test at the scheduled date, you must notify Ellen before the test and be prepared to provide a valid reason and if possible, documentation that clearly explains your absence. One make-up test will be scheduled for both Test 1 and Test 2 to accommodate students who miss a test due to illness and other legitimate reasons (dates TBD). Permission to write a makeup test is at the discretion of the professor.
- If you miss a lab, the ideal situation would be to cover the material at a later lab session. However, most lab sections are full, and it will not always be possible to accommodate requests to attend an alternate lab. The appropriate accommodation will be determined on a case-by-case basis. In all cases, you are responsible for the missed material. If you attend another lab section your assignment due date does not change.

**Note 1: If you have an Accessibility Plan that involves deferrals or extensions, you must contact your instructor in advance to implement your plan.*

**Note 2: Accommodations for long-term absences due to major physical or mental health conditions or other extenuating circumstances will be honoured as they arise, however, retrospective action will not be taken.*

Communication & Boundaries: Primary communication between the Instructor (Ellen) and students will be via Dalhousie email and Brightspace announcements. It is your responsibility to maintain regular checking of these platforms. Ellen's email hours will be as follows: Monday to Friday from 8:00am – 5:00pm. TAs are not available to answer emails.

Assessment Re-evaluation: If you have concerns about how your work was evaluated, you must contact Ellen within 7 days of releasing the grade. Please note that only specific reasons will result in a full re-evaluation of an assessment and know that your grade may stay the same, increase, or decrease. Resubmissions of graded assignments is not permitted.

Course Policies related to Academic Integrity

Referencing & Photo Credits: In your work, *all* statements that were not empirically derived by you as part of an experiment or study for that assignment, must be credited to a source. When crediting or referencing sources, please use the Name-Date system of the Council for Science Editors (CSE) style. In-text citations should be given as (Name Date), and all sources should be collected into a list at the end of your assignment and presented in CSE style. There is a link to the CSE style guide on the Brightspace page.

Photos: Not all photos presented on the internet are available for use. Some were developed for specific companies or sites and require permission or payments for use. However, if you look around you can often find photos that are published with creative commons or educational use licenses. Avoid using photos that are under copyright or where it is unclear what type of license they are published under. The name of the creator and the license it is being used under should be placed under the photo, and the full reference as a webpage should be placed in your reference list. If it is your own photo put your name and either used by permission or own use.

Taxa, Terminology, & Spelling: In all assessments, students are expected to know and be able to spell the names of taxa and terminology discussed in the class. A full list of the taxa you are expected to know can be found in the lab manual and on Brightspace.

Course Safety

Lab Safety: Student conduct in lab is regulated by the Student Code of Conduct. Lab rules are found in the lab manual and will be reviewed during the first lab session. There is a Lab Safety Quiz on Brightspace that students must complete within the first week of labs. This quiz is not for marks, but students must score 100% to access rest of quizzes.

COVID Safety: All students are required to comply with health and safety requirements on campus and should be considerate of others' health concerns. Non-compliance may be reported under the Student Code of Conduct. We will adhere to the most [recent COVID policies and procedures determined by Dalhousie University](#).

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) | |

The common grade scale definitions can be found at [Grade Scale and Definition](#).

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of 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.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.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.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

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

Statement: <http://www.dal.ca/cultureofrespect.html>

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 (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

<https://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=117&chapterid=-1&topicgroupid=31821&loaduseredits=False>

University Grading Practices

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

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/undergrad-students/degree-planning.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.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>