

**Faculty of Science Course Syllabus**

Department of Biology

BIOL 1011.03

Principles of Biology Part II

Winter 2024

The Dalhousie University Senate 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.

We recognize that African Nova Scotians are a distinct people whose histories, legacies and contributions have enriched that part of Mi'kma'ki known as Nova Scotia for over 400 years.

We strive to make this course, and the sciences in general, a field of study where peoples of all faiths, genders, race/ethnicities, and abilities are encouraged to understand and contribute to the pursuit of scientific knowledge.

<b>Instructor</b>	<b>Office</b>	<b>Email</b>	<b>Role</b>
M. Johnston	LSC 7132	mark.johnston@dal.ca	Plant Biology Lectures
S. Arif		sc428746@dal.ca	Ecology Lectures
I. Aubé	LSC 2132	isabelle.aube@dal.ca	Animal Biology Lectures
G. Gass	LSC 2116	gillian.gass@dal.ca	Course Coordinator, Lab Instructor
T. Bishop	LSC 2089	todd.bishop@dal.ca	Lab Instructor

**Lectures:** Tuesdays and Thursdays 1:05-2:25 p.m. (section 01) or 2:35-3:55 p.m. (section 02) Ondaatje Auditorium. We will aim to have captioned lecture recordings posted to Brightspace within seven days following the in-class lecture.

**Laboratories:** Eight laboratory sessions, each 110 minutes (see lab manual for schedule)

## Course Description

Biology 1011 broadens the background laid down in BIOL 1010 to include plant and fungi form and function, ecology, and animal form and function.

## Course Prerequisites

Knowledge of high school mathematics, chemistry and biology is recommended.

## Course Objectives/Learning Outcomes

Learning outcomes are provided to you as a rough guide to the most important concepts in the course.

Upon completing this course, students should be able to:

### *Plant Biology*

1. Understand the features that allowed plants to transition from aquatic to terrestrial environments.
2. Understand plant sexual reproduction and how it differs among the major groups.
3. Know the life cycles of major plant groups.
4. Describe the major plant cell, tissue and organ types.
5. Understand how land plants grow in length and diameter.
6. Understand how land plants transport fluids within the body.
7. Describe the components of photosynthesis and the main steps and products of each component.
8. Understand how plant hormones allow plants to respond to environmental cues.
9. Know basic features of the major groups of fungi, including structure, growth and life cycles.
10. Understand fungal ecological roles, relationships with humans and uses by humans.

### *Ecology*

1. Explain exponential population growth and intraspecific competition.
2. Use simple models to describe unlimited (exponential) and limited (logistic) population growth.
3. Provide examples of how biological interactions (competition, predation, mutualism) structure communities.
4. Explain why community or food web structure is likely to change if a top predator is removed.
5. Explain how humans are altering the global nitrogen (biogeochemical) cycle.
6. Interpret animal social behaviour in the light of natural selection (costs and benefits).
7. Provide an example of a life history trade-off.
8. Explain why small population size is of concern to conservation biologists.

*Animal Biology*

1. Explain core biological concepts in the context of animal biology, using appropriate examples.
2. Define an animal using the shared characteristics of animals.
3. Describe basic animal body plans, and relate different tissue types to their functions.
4. Define homeostasis and explain its maintenance through negative feedback mechanisms, using appropriate examples.
5. Describe early developmental processes in model animals (sea urchins, frogs).
6. Compare and contrast signaling in the nervous and endocrine systems, and explain how the mechanisms allow for body-wide communication and coordination of a variety of functions.
7. Describe mechanisms used by animals to obtain energy and nutrients, highlighting form and function in digestive systems of a variety of animals.
8. Describe mechanisms used by animals to exchange gases with their external environment, highlighting form and function in respiratory systems of a variety of animals.
9. Describe the long distance transport of materials within animal bodies, highlighting form and function in circulatory systems of a variety of animals.
10. Describe mechanisms of osmoregulation and thermoregulation in a variety of animals.
11. Describe basic elements of immune systems and how they function to protect animals from pathogens.
12. Describe skeletal muscle structure and function; describe various forms of locomotion with respect to their biomechanics and energetics.
13. Provide examples of the interconnected functioning of multiple organ systems.

*Laboratory*

1. Identify the design elements of an existing experiment, with particular attention to the role of controls.
2. Collect both quantitative and qualitative data through careful observations.
3. Use and know when to make use of common biological research tools such as compound microscopes, pipettors, balances, and enzyme assays.
4. Present data using written descriptions, graphs, tables, and sketches; and interpret published visual representations of biological data.
5. Write a properly formatted CSE-style (Council of Science Editors) citation for a website, article or book; quote from and/or cite published material as appropriate.
6. Read and interpret a recent primary research article from a scientific journal and discuss its content with classmates, understanding the role of each major section of a scientific article (Introduction, Methods, Results, Discussion).
7. Analyze data using basic statistical concepts (mean, standard deviation, standard error, n, 95% confidence interval).
8. Use mathematical analysis to evaluate the effects of interspecific competition and to determine population size and growth patterns.
9. Interpret data (e.g., graphs and tables) to assess hypotheses and generate conclusions.

## Course Materials

### *Textbook*

The textbook for this course is called *Campbell Biology, 3<sup>rd</sup> Canadian Edition, 2017* by Urry et al. (Pearson Benjamin Cummings, Menlo Park, CA), and is available at the Dalhousie University Bookstore. Second-hand copies of the textbook are suitable for the class. We will also provide page numbers for readings from the previous edition of the textbook (8<sup>th</sup>, 9<sup>th</sup> or Dalhousie edition of Campbell Biology). A few copies of the text are on reserve in the Killam Library. Please plan to make regular use of the textbook. We do not use the Mastering Biology online resource that comes with new copies of the textbook for any class assignments although you are welcome to use it as an additional resource for studying.

### *BIOL 1011 Brightspace site*

The Brightspace site is accessible at [via dal.ca](http://dal.ca). Login using the same information that you use to access your Dalhousie e-mail. This site provides lecture information, study aids, Powerpoint presentations from lectures, marks for labs and exams, and important announcements. You are expected to check Brightspace, as well as your Dalhousie e-mail, frequently.

## Course Assessment

The exams in this course are multiple choice format and they evaluate several skills, including knowledge, comprehension, application, and analysis of information. Success in the course requires that you both remember and understand the class material. Most professors will provide practice questions, and other questions and problems are also available at the end of each chapter in the textbook.

Of the 100 marks available in BIOL 1011, 60 are allotted to the lecture component and 40 to the laboratory as follows:

Midterm exam	February 7, 2024	20%
Final Exam	Scheduled by Registrar	40%
Laboratory *	Ongoing during term	40% for lab assignments and pre-lab quizzes

\* The distribution of laboratory marks is described in the laboratory manual, which must be purchased from the campus bookstore prior to your first laboratory session.

You must bring your Student ID card to all final exams. All electronic devices, including calculators, cell phones, and electronic translators, are prohibited at exams. If English is not your first language and you require a dictionary, you may bring with you to exams a paper language-to-language translation dictionary, which must be approved by an instructor prior to use. The midterm exam only covers lecture material from the Plant Biology unit (I), while the final exam only covers lecture material from the Ecology (II) and Animal Biology (III) units.

The Registrar's Office has scheduled the final examination period from April 13-25, 2023. The dates, times and locations of the final exam are arranged by the Registrar's Office, and posted well in advance of the end of term. It is important that you not make arrangements for travel during that time.

## Other course requirements

Laboratories are held most weeks; please check the schedule in your lab manual. There are 30 students in each laboratory with one Teaching Assistant (TA) who answers questions and instructs students on how to conduct laboratory exercises; as well, an Instructor is supervising three lab rooms at any one time. You must attend the laboratory in your scheduled room and time slot. There are quizzes and assignments to be completed throughout the term. Assignments must be handed in at the end of the laboratory period; if you find it difficult to finish laboratories in the allotted time, please speak to a lab instructor.

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

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

Please note: a grade of C or better in BIOL 1011 is required for entry into the second year biology classes BIOL 2003 and BIOL 2060. A C or better in both of BIOL 1010 and 1011 is required for entry into the second year biology class BIOL 2004.

## Course Policies

### Make-up Examinations

“A student requesting an alternative time for a final examination will be granted that request only in exceptional circumstances.” ([Undergraduate Calendar 2023-24](#)) Make-up exams will take place after the scheduled exam, with time and location of make-up exams announced on the course Brightspace site. Make-up exams are intended for students who miss a scheduled exam because of illness or some other legitimate reason. They are not available to students who do poorly on the regular examination and want to improve their mark. Students must provide appropriate documentation to the Course Coordinator within one week of the scheduled exam in order to write the make-up exam. There will be one makeup exam scheduled for each of the midterm and final exams. If students miss both the main exam and makeup exam, any further makeup exams will be scheduled at the discretion of the course coordinator. The course coordinator has the ability to impose a 5% reduction in exam grade for each missed exam reschedule after the main makeup exam occurs.

### Absences

It is the responsibility of students who are absent from lectures and laboratories to ascertain what was missed, including announcements of tests and other information. If you miss one or more lectures for medical reasons, contact the course coordinator to discuss options for catching up on missed lecture material. Absence from a lab at which an assignment is due requires that you contact Todd or Gillian within 48 hours of your absence to avoid losing marks.



<b>OUTLINE OF LECTURES</b>			
<b>Unit</b>	<b>Date</b>	<b>Topic</b>	<b>Lecturer</b>
<b>PLANT BIOLOGY</b>	Jan. 9	Introduction; Plants and the Colonization of Land	M. Johnston
	Jan. 11	Major Groups of Land Plants; Plant Reproduction	
	Jan. 16	Plant Reproduction, Structure, and Growth	
	Jan. 18	Primary Growth, Secondary Growth, and Transport	
	Jan. 23	Transport II; Photosynthesis	
	Jan. 25	Photosynthesis II; Control Systems	
	Jan. 30	Fungi	
	Feb. 1	Plants Review Class	
<b>ECOLOGY</b>	Feb. 6	Introduction to Ecology and the Biosphere	
	<b>February 7: midterm test (details to be announced)</b>		
	Feb. 8	Population Ecology	
	Feb. 13	Species Interactions	
	Feb. 15	Patterns of Species Diversity	
	<b>February 19-23: Study break (no classes)</b>		
	Feb. 27	Ecosystem Dynamics	
	Feb. 29	Behavioural Ecology	
	Mar. 5	Conservation Biology	
	<b>ANIMAL BIOLOGY</b>	Mar. 7	
Mar. 12		Animal Development	
Mar. 14		Communication and Coordination Systems	
Mar. 19		Nutrition and Energetics	
Mar. 21		Circulation and Gas Exchange	
Mar. 26		Regulation of Temperature and Solutes	
Mar. 28		Immune System	
Apr. 2		Locomotion	

**Final exam to be scheduled by Registrar.**

## 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](mailto:elders@dal.ca). Additional information regarding the Indigenous Student Centre can be found at: [https://www.dal.ca/campus\\_life/communities/indigenous.html](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](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](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>)

Please do not hesitate to access any of your approved accommodations. If you had adaptations or accommodations in high school, or if you have not previously had accommodations but are encountering barriers to learning, it's worth a chat with an Access advisor to find out what might be set up for your university learning. You don't need to have documentation to get the process started, and creating an access plan can take some time, so it's a good idea to talk with an Access advisor even if you're still waiting for, or aren't sure what's required as, documentation.

### **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](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](https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-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.



## **FREQUENTLY ASKED QUESTIONS**

### **1. I am having trouble accessing the Brightspace site. How do I get help?**

Contact the Killam Help Desk at 494-2376 or [HelpDesk@dal.ca](mailto:HelpDesk@dal.ca) or find them in person at the South Learning Commons of the Killam Library.

### **2. I missed my laboratory. What should I do?**

You should talk to either Todd or Gillian as soon as possible to explain your absence in order to avoid losing marks.

### **3. I missed an exam because I was sick. What should I do about writing the make-up exam? Do I need a doctor's note?**

You should contact Gillian concerning permission to write the make-up exam. A Dr's note is NOT required.

### **4. My team is playing a game out of town the day of the mid-term exam. What should I do about writing the make-up exam?**

You should contact Gillian for permission to write the make-up exam. You will need a signed note from your coach to verify the reason for your absence.

### **5. I have questions about the lecture material. How do I get help?**

You should contact the person giving the lectures for that unit.

### **6. I'm not sure what material will be on the lecture exam. How do I get this information?**

You should contact the person giving the lectures for that unit.

### **7. I have trouble with multiple choice exams. What should I do?**

You may wish to attend a Study Skills Workshop on "Writing Multiple Choice Exams" offered through the Studying for Success program ([www.dal.ca/sfs](http://www.dal.ca/sfs)). Students sometimes find certain types of multiple choice questions more difficult than others. By reviewing your BIOL 1011 midterm exam, you can determine whether you tend to get a particular type of question wrong more often than other types. If so, then you should make an effort to get as much practice as possible with that form of question (e.g. do questions at the end of text chapters, talk to the professor teaching the unit regarding sample exam questions, work with friends and create practice questions).

### **10. May I make an audio recording of the lectures?**

In-person lectures are recorded and posted to Brightspace approximately one week after the lecture.

### **11. I'm not satisfied with my grade in the course. Can I do an extra assignment to get more marks?**

No. The labs, quizzes and exams are the only graded material in the course, so do your best work on each assignment throughout the term.

# 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](http://www.dal.ca/academics/important_dates.html)

Classroom Recording Protocol:

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/classroom-recording-protocol.html](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](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](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](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](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](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](https://www.dal.ca/campus_life/academic-support/On-track.html)

Indigenous Student Centre: [https://www.dal.ca/campus\\_life/communities/indigenous.html](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](mailto: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](https://www.dal.ca/campus_life/communities/black-student-advising.html)

International Centre: [https://www.dal.ca/campus\\_life/international-centre.html](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](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](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](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>