



Faculty of Science Course Syllabus
Department of Biology
BIOL 3078 and MARI 3074
Animal Physiology and Marine Animal Physiology, Part I
Fall 2022

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: Dr. Glenn Crossin, Glenn.Crossin@dal.ca

Lab Instructor & Course Coordinator Nina Hamacher, nhamacher@dal.ca; LSC 7026

Lectures: LSC-PSYCHOLOGY, Room P4260
8:35 – 9:25am, Monday, Wednesday, Friday

Lectures will be delivered live, in the classroom. They will **not** be recorded.

Laboratories: LSC, Room 7009

There will be **six** in-person laboratories during the fall term.

BIOL 3078 B01: Monday, 2:30-5:30pm.
B02: Tuesday, 2:30-5:30pm.

MARI 3074 B01: Wednesday, 2:30-5:30pm.
B02: Thursday, 2:30-5:30pm.

Course Description

Lectures on the mechanisms which coordinate the activities of cells within multicellular organisms and permit such organisms to remain in homeostatic balance. The emphasis is on the mechanisms most widely distributed throughout the animal kingdom. The laboratories are designed to illustrate these principles in a variety of organisms.

PREREQUISITES: BIOL 2003.03 and BIOL 2020.03 (or BIOA 2001.03)

Learning Objectives

By the end of this course, students should be able to:

- Understand how physiological processes underlie life history variation in wild animals
- Understand the role that environment and climate play in physiological processes
- Explain the integration of the sciences at the physiological level from molecules to populations
- Define and give examples of homeostasis
- Describe the structure of somatic and smooth muscle tissue and explain how it functions
- Describe the structures and pathways involved in sensory reception
- Outline basic endocrine functioning
- Relate how nerves and muscles coordinate to allow for movement
- Describe physiologic reproductive strategies across species
- Explain neuronal function and signal transmission
- Outline digestion and absorption strategies and processes across species
- Outline the adaptations and diversity of physiology across terrestrial and marine phyla
- Collect qualitative and quantitative data and interpret the experimental results
- Practice oral and written communication skills
- Critically analyze/interpret data from lab simulations or scientific journal papers
- Conduct literature and online searches of primary and secondary sources using electronic data bases and online search tools

Course Materials

Hill, R. W., Cavanaugh, D. and M. Anderson. *Animal Physiology*. Fifth edition. 2021.

You will be able to access the e- textbook inside of Brightspace. All you need to do is click on the link to the e-textbook. You can access your course material for free any time before the add-drop deadline. If you have any questions, please feel free to reach out to support@willolabs.com.

Knisely, K. *A Student Handbook for Writing in Biology*. Fourth edition. 2004.

Alternatively, you can use for free Dalhousie's library information on scientific writing found at [Resources for Scientific Writing](#)

Course Assessment

Lecture portion 60% of final grade:

Lecture Exam 1 – 20%

Lecture Exam 2 – 20%

Final Lecture Exam (during Finals period) – 20%

There are 3 exams scheduled – 2 during the term, and a final exam. In these you will be required to respond, in expository form, to questions about physiological processes or problems extending from material discussed in lecture and in the text. Grading will reflect how convincingly you answer the questions, which includes your ability to articulate ideas as well as your use of proper grammar and syntax.

All exams will be 50 mins in duration.

Laboratory portion 40% of final grade:

There are 6 labs with assignments (65%) and a final lab exam (35%) that will be scheduled at the same time as the final lecture exam, during the December final exam period.

Laboratory assignment, due date and evaluation information are found in the laboratory folder on Brightspace.

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)	



Course Policies

To avoid any misunderstanding or confusion during the term, please note the following policies. These regulations have been put in place to try to ensure fair and equal treatment for all. Extenuating circumstances can arise, however, so please feel free to talk to us if you have problems with any of these regulations at any time during the term.

Missed or Late Academic Requirements due to Student Absence

Please inform us in advance if you are unable to attend any of the exams. They will normally only be rescheduled for illness, and we will require a Self Declaration of Absence (SDA) form. Make up exams will be given **within one week** of the scheduled exam date at a mutually convenient time. **PLEASE NOTE:** We are **NOT** obligated to provide you with a makeup exam, so excuses other than illness or extreme circumstance are unlikely to be considered. The weight of missed exams will not be redistributed across other exams.

SDA forms can be used if you cannot attend any of the lab sections for a particular lab. However, you are expected to hand in the lab report for the missed lab on the given due date. Without submission of an SDA form, there is a penalty of 2% from the total course grade for missed lab attendance. Missing more than 2 labs (with or without SDA) will result in a grade of zero for the lab portion of the class.

SDA forms cannot be used to gain extensions on lab assignments. Late laboratory assignments will only be marked in unusual circumstances with the permission of the Lab Instructor, and a penalty of **10% per day** will be deducted. Anything more than 5 days late will not be accepted.

Only TWO SDA forms may be used, in any combination of lectures and laboratories, throughout the term.



Plagiarism and Academic Integrity:

You are expected to abide by Dalhousie University's policies on academic integrity.

We encourage you to work with classmates to help each other learn the content of the class. The Discussion boards will be particularly important for asking questions and receiving help.

However, all assignments that you submit must be independent and entirely your own wording.

You can work together to understand content, but assignments must be your own work. This class subscribes to a Brightspace Learning web-based service that checks for originality in submitted work. This service will be used for all assignments and any online exams submitted.

If at any point exams cannot take place in a proctored setting this year, remember that they are independent assessments. You may consult your notes, textbook, or other course content, but you cannot collaborate with classmates or post questions to external websites. By accessing an exam, you are promising that the work submitted is solely of your own efforts.

The contents of the assessments in the course are the property of BIOL 3078/MARI 3074 and are confidential. You may **not** share the contents of these assessments on 'homework sharing' websites, (e.g. Chegg, Course Hero, Studocu, etc.)

Copyright Notice:

All course materials are designed for use as part of BIOL 3078/MARI 3074 at Dalhousie University and are the property of the course instructors. This includes all images, videos, documents, assignments and exams. These documents are solely for your learning and evaluation in BIOL 3078/MARI 3074. It is an academic offence to share these materials outside of this course space in such a way that others might gain an unfair advantage, and students who do so may be subject to University discipline. Copying this material for distribution may also lead to a violation of Copyright law.

Lecture schedule

Week of	Day	Lec #	Topic	Chapter
Sept 7 - 9	Wed		COURSE INTRODUCTION	
	Fri	1	Physiological Diversity, Mechanisms & Origins	1
Sept 12 - 16	Mon	2	Internal Constancy vs. Conformity, and Homeostasis	1
	Wed	3	The Physical and Chemical Environment	1
	Fri	4	Evolutionary processes and physiology	1
Sept 19 - 23	Mon	5	Dealing with Temperature - Ecothermy & Homeothermy	10
	Wed	6	Dealing with Temperature - Endothermy	10
	Fri	7	Physiology and Climate Change	lecture
Sept 26 - 30	Mon	8	Enzymes - instruments of change	2
	Wed	9	Nervous System and Neurons	12
	Fri		Truth & Reconciliation day - University closed	
Oct 3 - 7	Mon		RECITATION	
	Wed		EXAM 1: Lectures 1-9	
	Fri	10	Membrane Potentials & Action Potentials	12,13
Oct 10 - 14	Mon		Thanksgiving Holiday – University closed	
	Wed	11	Sensory systems 1 - Vision part 1	14
	Fri	12	Sensory systems 1 - Vision part 2	14
Oct 17 - 21	Mon	13	Sensory systems 2 - Mechanoreception & Touch	14
	Wed	14	Sensory systems 3 - Hearing	14
	Fri	15	Muscle Physiology	20
Oct 24 - 28	Mon	16	Muscle Anatomy	20
	Wed	17	Muscle Energetics	20
	Fri		RECITATION	
Oct 31 - Nov 4	Mon		EXAM 2: Lectures 10-17	
	Wed	18	Endocrine Physiology	17
	Fri	19	Stress and Parental Care	lecture
Nov 7 - 11	Mon		READING WEEK - No classes	
	Wed		READING WEEK - No classes	
	Fri		READING WEEK - No classes	
Nov 14 - 18	Mon	20	Sexual Reproduction - Mating systems	17
	Wed	21	Reproduction in Placental Mammals	17
	Fri	22	Reproduction in Non-placental Animals	lecture
Nov 21 - 25	Mon	23	Reproduction in Invertebrates	lecture
	Wed	24	Nutrition	19
	Fri	25	Foraging	19
Nov 28 - Dec 2	Mon	26	Digestion and Absorption	19
	Wed	27	Evolutionary Physiology 1 - The Penguins	lecture
	Fri	28	Evolutionary Physiology 2 - The Curious Case of Egg Size Dimorphism	lecture
Dec 5 - 7	Mon		RECITATION - END OF TERM	
	TUES		RECITATION - END OF TERM	
FINALS PERIOD			EXAM 3: Lectures 18-25 - Date TBA	

Laboratory schedule

Date	Lab #	Description
Sept 12 – 16	1	Introduction and Statistics in Physiology
Sept 19 – 23	2	Temperature Effect on Daphnia
Sept 26 – 30		No Labs – Report writing
Oct 3 – 7	3	The Neuromuscular System of the Crab
Oct 10 – 14		No Labs – Report writing
Oct 17 – 21	4	Visual Perception and Adaptation
Oct 24 – 28		No Labs – Report writing
Oct 31 – Nov 4	5	Invertebrate Smooth Muscle
Nov 7 – 11		No Labs – Reading week
Nov 14 – 18		No Labs – Report writing
Nov 21 – 25	6	Sensory Perception in the Snail
Nov 28 – Dec 2		No Labs – Report writing
Nov 5 – Dec 7		No Labs – End of term
Finals period		Final Lab Exam



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&loadusercredits=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>