DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus
Department of Biology
BIOL 3078 and MARI 3074
Animal Physiology and Marine Animal Physiology, Part I
Fall, 2021

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

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

Lab Instructor: Nina Hamacher, nhamacher@dal.ca

Lectures: Delivered in person, 8:35 – 9:25am, Monday, Wednesday, Friday
Henry Hicks Room 212.

*** However, there remains the possibility that by the start of the term on Sept 7th, lectures will moved online to synchronous delivery through Brightspace. I will inform you of this decision before the start of the term, as soon as possible, via an email to your campus email address. Also note that even if classes begin in person, they could be moved online at any time, depending on the course of the pandemic and Delta variant, and by university and public health directives.

*** ALSO NOTE: 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 Code of Student Conduct.

Laboratories: LSC Room 7009, 3 hours

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 online lab simulations.

Course Prerequisites
BIOL 2003.03, and BIOL 2020.03 (or BIOA 2001.03)

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CROSS-LISTING: MARI 3074.03

Course Objectives/Learning Outcomes

- 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 (write of formal laboratory sections and a short review research article, discuss research results from scientific papers)
- 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., G. Wyse and M. Anderson. *Animal Physiology.* Fourth edition. 2016.

You will be able to access the e- textbook inside of D2L/Brightspace. All you need to do is simply 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 Exam 1	20%
Lecture Exam 2	20%
Final Lecture Exam (during Finals period, TBA)	20%
Laboratory assignments and exams	40%
Total	100%

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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.

The two lecture exams will be administered in the classroom, in person. Given that Henry Hicks 212 is a small room, each exam will be delivered over two consecutive class days (e.g. a Mon and a Weds). On the first day, half the class will take the exam, and on the second day the other half will take the exam. This will give you the physical distance needed to take the exam comfortably.

However, if the class is moved online, then the exams will still be delivered in person, in the classroom on two consecutive class days as described above.

All exams will be 50 mins in duration. If done online, a 5% penalty will be applied for every 5 minutes that your exam is submitted late. Brightspace keeps track of the time.

Laboratory assignments and evaluation information are found in the laboratory folder on Brightspace. This class subscribes to a Brightspace Learning web-based service that checks for originality in submitted papers.

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

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 Illness certificate. Only TWO of these certificates may be used in any combination of lectures and laboratories. 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 grant you a makeup exam, so excuses other than illness or extreme circumstance will not be considered.

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Week of	Day	Lec #	Topic	Chapter
Sept 8 - 10	Wed		COURSE INTRODUCTION	
	Fri	1	Physiological Diversity, Mechanisms & Origins	1
Sept 13 - 17	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 20 - 24	Mon	5	Dealing with Temperature - Ecothermy & Homeothermy	10
	Wed	6	Dealing with Temperature - Endothermy	10
	Fri	7	Physiology and Climate Change	n/a
Sept 27 - Oct 1	Mon	8	Enzymes - instruments of change	2
	Wed	9	Nervous System and Neurons	12
	Fri		**RECITATION**	
Oct 4 - 8	Mon		**EXAM 1, Lectures 1-9: Group 1**	
	Wed		**EXAM 1, Lectures 1-9: Group 2**	
	Fri	10	Membrane Potentials & Action Potentials	12,13
Oct 11 - 15	Mon		**Thanksgiving Holiday – University closed**	
	Wed	11	Sensory systems 1 - Mechanoreception & Touch	14
	Fri	12	Sensory systems 2 - Hearing	14
Oct 18 - 22	Mon	13	Sensory systems 3 - Vision part 1	14
	Wed	14	Sensory systems 3 - Vision part 2	14
	Fri	15	Endocrine Physiology	17
Oct 25 - 29	Mon	16	Stress and Parental Care	n/a
	Wed	17	Sexual Reproduction	17
	Fri		**RECITATION**	
Nov 1 - 5	Mon		**EXAM 2, Lectures 10-17: Group 1**	
	Wed		**EXAM 2, Lectures 10-17: Group 2**	
	Fri	18	Reproduction in Placental Mammals	17
Nov 8 - 12	Mon		**READING WEEK - No classes**	
	Wed		**READING WEEK - No classes**	
	Fri		**READING WEEK - No classes**	
Nov 15 - 19	Mon	19	Reproduction in Non-placental Animals	n/a
	Wed	20	Muscle Physiology	20
	Fri	21	Muscle Types	20
Nov 22 - 26	Mon	22	Muscle Energetics	20
	Wed	23	Nutrition	19
	Fri	24	Foraging	19
Nov 29 - Dec 3	Mon	25	Digestion and Absorption	19
	Wed	26	Evolutionary Physiology 1 - The Penguins	n/a
	Fri	27	Evolutionary Physiology 2 - Egg Size Dimorphism	n/a
Dec 6 - 7	Mon		RECITATION - END OF TERM	
	TUES		RECITATION - END OF TERM	
FINALS PERIOD			**EXAM 3, Lectures 18-27 - Date and Location TBA**	

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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://www.dal.ca/academics/important_dates.html

University Grading Practices

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

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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/academic-advising.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/services-support/student-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