

## Syllabus

# Comparative Animal Physiology

Department of Biology  
BIOL/MARI 3370, Fall 2025

*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.*

### Lecturer

Name	Email	Office hours
Prof. Glenn Crossin www.evophys.ca	Glenn.Crossin@dal.ca	By appointment, LSC 6060, Email me.

### Course Description

Lectures on the physiological mechanisms that underlie and coordinate the movement, reproduction, survival, and fitness of animals.

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

**EXCLUSIONS:** BIOL 3078.03, BIOL 3079.03, MARI 3074.03, and MARI 3076.03

### Course Structure

Delivery:

- Lectures will be delivered live, in the classroom. They will not be recorded.
- Dates and Location: MWF, 0835-0925 | LSC-Psychology P4260.

### Course Materials

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

I strongly recommend that you purchase the textbook. Physiological processes are complex, and taking the time to read and absorb this information is very worthwhile. Most of my lectures are drawn directly from the textbook. For those who don't purchase it, limited copies of the textbook will be on

reserve at the Killam Library. The 5<sup>th</sup> edition of the textbook is the one used in this class, but the 3<sup>rd</sup> and 4<sup>th</sup> editions are acceptable. The library has these as well.

## Learning Objectives

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

- Understand how physiological processes underlie life history variation in wild animals.
- Explain the roles of the environment and climate in physiological processes and animal survival.
- Explain how physiological variation at the molecular, cellular, and tissue levels influence whole-organism functioning, behaviour, and fitness.
- Define and give examples of homeostasis.
- Explain the basics of neuronal function and signal transmission.
- Describe the structures and signal pathways involved in sensory perception.
- Relate how nerves and muscles coordinate to allow for movement.
- Describe the structure and function of skeletal muscles.
- Explain the basics of endocrine functioning, especially its role in the control and coordination of mammalian reproduction (follicle recruitment and development, endometrial development, fertilization, lactation, etc).

## Assessments

Exam 1	40%
Exam 2	35%
Exam 3	25%
<b>Total</b>	<b>100%</b>

There are 3 exams, all of which occur in the classroom during the scheduled class time, or at the Access Centre if you have pre-arranged this. In these exams you will respond to questions, in expository form, about physiological processes or problems, as covered in the lectures and textbook

Exams are **writing intensive**, and so your ability to articulate ideas and use proper grammar and syntax are important. Because grading will reflect how convincingly and accurately you answer each question, its important that your writing is clear. Each assessment is 50 mins in duration (class time).

**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)	

**Tentative lecture schedule...**

Week of	Day	Lecture	Chapt	Topic
Sep 3 – 5	Wed	-	-	<b>Dalhousie Administrative Lock-Out</b>
	Fri	-	-	<b>v</b>
Sep 8 – 12	Mon	-	-	<b>v</b>
	Wed	-	-	<b>v</b>
	Fri	-	-	<b>v</b>
Sep 15 – 19	Mon	-	-	<b>v</b>
	Wed	-	-	<b>v</b>
	Fri	-	-	<b>v</b>
Sep 22 – 26	Mon	-	-	<b>v</b>
	Wed	-	-	COURSE INTRODUCTION
	Fri	1	1	Physiological Diversity, Mechanisms and Origins
Sep 29 – Oct 3	Mon	2	1	Environmental Contexts
	Wed	3	1	Homeostasis: Internal Constancy vs Conformity
	Fri	4	1	Evolutionary Process & Physiological Phenotypes
Oct 6 – 10	Mon	5	10	Ectothermy, Homeothermy
	Wed	6	10	Endothermy
	Fri	7	-	Physiology and Climate Change
Oct 13 – 17	Mon	-	-	<b>No Classes - Thanksgiving</b>
	Wed	-	-	<b>Recitation</b>
	Fri	-	-	<b>EXAM 1: Lecture 1-7 (40%)</b>
Oct 20 – 24	Mon	8	2	Enzymes – Instruments of Change
	Wed	9	14	Sensory Systems – Mechanoreception and Touch
	Fri	10	14	Sensory Systems – Hearing
Oct 27 – 31	Mon	11	14	Sensory Systems – Vision 1
	Wed	12	14	Sensory Systems – Vision 2
	Fri	13	17	Endocrinology
Nov 3 – 7	Mon	-	-	<b>Recitation</b>
	Wed	-	-	<b>EXAM 2: Lecture 8-14 (35%)</b>
	Fri	-	-	> Research Lecture: Stress & Foraging
Nov 10 – 14	Mon	-	-	
	Wed	-	-	<b>Reading Week</b>
	Fri	-	-	
Nov 17 – 21	Mon	14	17	Sexual Reproduction & Mating Systems
	Wed	15	17	Reproduction in Placental Mammals
	Fri	16	-	Reproduction in Egg-laying Vertebrates
Nov 24 – 28	Mon	-	-	> Research Lecture: Egg Size variation in Penguins
	Wed	17	-	Stress & Parental Care
	Fri	18	-	Birth Control & John Rock's Error
Dec 1 – 5	Mon	19	-	Menopause
	Wed	20	20	Muscular function
	Fri	-	-	<b>Recitation</b>
Dec 8 – 9	Mon	-	-	<b>EXAM 3: Lecture 14-20 (25%)</b>
	TUES	-	-	> Guest lecture, pending

## 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.

### Missing an Exam or Assignment

**Without prior notification, a missed exam will receive a 5 percentage point reduction in grade (e.g. exam grade of 100% changes to 95%, while 85% changes to 80%, etc). To avoid this, you MUST Inform me by the night before an exam** if you are going to miss it, and at that time you must also submit a Self Declaration of Absence (SDA) form. Notifying me during the exam, or after the exam will result in the 5 point reduction. ***ONLY one SDA is permitted during the term ...*** a make-up exam will then be offered, which must be written within 2-3 days of the originally scheduled exam date. For example, if the exam was on a Monday, you must then rewrite it by Thursday; if the exam was on a Friday you must rewrite on Monday; but if the exam was on a Wednesday, then you must write it within 2 days, by Friday. Makeup exams will not be offered after this 2 or 3 day timeframe. If an exam is missed without a makeup, the weight of that missed exam will not be redistributed across other exams.

After the single SDA is used, subsequent exams requiring rescheduling will be docked 5 points. Note that I am 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.

Makeup exams are completely new exams – they will not be the same exam that your peers wrote in the classroom. It will ask different questions and cover different topics, but all from the material expected for the exam as detailed in the syllabus. But it behooves you to take the in-class exam.

### 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 lectures.

### Copyright Notice

The assessments of your work (exams, presentations, essays) are the property of the course and are kept confidential. **You may not share the contents** of these assessments on 'homework sharing' websites like Chegg, Course Hero, Studocu, etc. This includes all images, videos, documents, assignments and exams. 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.

## University Policies and Statements

### **Recognition of 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)

### **Academic Integrity**

Dalhousie University expects all of its students to espouse the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all of your academic dealings. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity: [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)

### **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 your willingness to hear and tolerate opposing points of view. Respect for individual differences and alternative viewpoints is expected for all class members. The language used to express and respond to different points of view must remain within acceptable bounds of civility and respect; denigration and disparity will not be tolerated.

### **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. Dalhousie's Strategic Direction prioritizes the fostering 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. Dalhousie has the right to take disciplinary action if students breach the Student Code of Conduct. Violations of the code can be resolved in a reasonable and informal manner, e.g. through a restorative justice process. If an

informal resolution can't be achieved, then a formal dispute resolution process would be initiated. 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)

### **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.