

**Faculty of Science Course Syllabus**  
**Department of Biology**  
**BIOL 3078 and MARI 3074**  
**Animal Physiology and Marine Animal Physiology, Part I**  
**Fall, 2019**

**Instructor(s):** Dr. Glenn Crossin; [Glenn.Crossin@dal.ca](mailto:Glenn.Crossin@dal.ca); room 6062  
Dr. Nancy McAllister-Irwin; [irwinn@dal.ca](mailto:irwinn@dal.ca); room 6130

**Lectures:** M, W, F; 10:35 – 11:25 Hicks 212

**Laboratories:** Room 7009, 3 hours

**BIOL 3078**

B01: Monday, 2:30-5:30pm, Room 7009, Biology Department.  
B02: Tuesday, 2:30-5:30pm, Room 7009, Biology Department.

**MARI 3074**

B01: Wednesday, 2:30-5:30pm, Room 7009, Biology Department.  
B02: Thursday, 2:30-5:30pm, Room 7009, Biology Department.

---

**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.

**Course Prerequisites**

BIOL 2003.03, and BIOL 2020.03 (or BIOA 2001.03)

CROSS-LISTING: MARI 3074.03

**Course Objectives/Learning Outcomes****Skills in BIOL 3078/79 and MARI 3074/76**

## Communication skills

- Writing of formal laboratory sections – better understanding of grammatical rules
- Discussion skills

## Critical thinking

- Critical analysis of scientific journal paper
- Analysis/interpretation of scientific journal papers for experimental exercises
- Analysis and interpretation of data from experimental exercises and computer simulations

## Library/web search skills

- Conduct literature and online searches of primary and secondary sources using electronic data bases and online search tools

## Computer skills

- Use of computer software for word processing and data analysis

## Statistical/data analysis

- Use of statistical packages to display graphs and charts for assignments

## Teamwork skills

- Work in pairs or small groups to develop data for assigned experiments

## Problem solving

- Problem solve in many laboratory and simulation exercises

## Practical skills

- Basics – dissection, microscopy, micrometers, pipetting, spectrophotometry, chemical dilutions, titrations, animal handling, chemical and laboratory safety concepts
- Specific – electro-physiological transducers, recording oscillographs, pulse stimulators
- Digital plethysmographs, blood pressure cuff, ECG
- Sensory physiology systems
- Reflexes
- Human renal recording (osmometers, specific gravity meters, chloride ion titrations)
- Circulatory physiology – identification of blood vessels and cells, hematocrit determinations, haemoglobin measurements
- Respiratory and exercise physiology – spirometers, dissolved oxygen meters

### Course Materials

Hill, R., G. Wyse and M. Anderson. *Animal Physiology*. Fourth edition. 2016.

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

### Course Assessment

1 <sup>st</sup> exam: Lectures 1-7 (Sept. 25 <sup>th</sup> )	10%
2 <sup>nd</sup> exam: Midterm, cumulative 1 <sup>st</sup> half (Oct. 18 <sup>th</sup> )	20%
3 <sup>rd</sup> exam: Lectures 14-20 (Nov. 8 <sup>th</sup> )	10%
4 <sup>th</sup> exam: Final, cumulative 2 <sup>nd</sup> half (during finals)	20%
Discussion paper	10%
<u>Laboratory assignments (reports, quizzes, exam, discussion)</u>	<u>30%</u>
Total	100%

Exams 1-3 will be 50 minutes long and will be scheduled during a lecture period. The 4th exam and Laboratory exam will be combined and written together during the regular examination period scheduled by the Registrar's office during the official examination time at the end of the term. **Please ensure your travel plans do not overlap with the examination period, as this is not a valid excuse for deferring or advancing a final examination.**

Laboratory assignments and evaluation information are given in the laboratory manual. 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. A doctor's note is required for an illness during the formal university end of term examinations. 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 providing you with a makeup exam, so excuses other than illness or extreme circumstance will not be considered.

Week of	Day	Lec	Topic	Chpt	Lecturer
Sept 4 - 6	Wed	Intro	Introduction & Administration	-	Crossin
	Fri	1	Physiological Diversity, Mechanisms & Origins	1	
Sept 9 - 13	Mon	2	Homeostasis, Regulation & Conformity	1	
	Wed	3	The Physical & Chemical Environment	1	
	Fri	4	Evolutionary Processes	1	
Sept 16 - 20	Mon	5	Dealing with Temperature: Ecothermy	10	
	Wed	6	Dealing with Temperature: Endothermy / Homeothermy	10	
	Fri	7	Physiology and Climate Change		
Sept 23 - 27	Mon		RECITATION		
	Wed		<b>Exam: Lecture 1-7</b>		
	Fri	8	Instruments of Physiological Change - Enzymes	2	
Sept 30 – Oct 4	Mon	9	Integrative Systems – Neurons & Nervous systems	12	
	Wed	10	Membrane Potentials, Action Potentials, Synapses	12,13	
	Fri	11	Sensory Systems - Overview	14	
Oct 7 - 11	Mon	12	Sensory Systems examples – Olfaction (salmon, seabirds)	14	
	Wed	13	Sensory Systems examples – Echolocation (bats, dolphins)	14	
	Fri	14	TBA		
Oct 14 - 18	Mon		<b>Thanksgiving Holiday – University closed</b>	-	
	Wed		RECITATION	-	
	Fri		<b>MIDTERM EXAM: Friday, October 18th</b>		
Oct 21 - 25	Mon	14	Photoreception 1	14	
	Wed	15	Photoreception 2	14	
	Fri	16	Endocrine Physiology	17	
Oct 28 - Nov 1	Mon	17	Stress and Parental Care	-	
	Wed	18	Sexual Reproduction	17	
	Fri	19	Reproduction of placental mammals	17	
Nov 4 - 8	Mon	20	Reproduction of non-placental animals	-	
	Wed		RECITATION		
	Fri		<b>EXAM: Lectures 14-20</b>		
Nov 11 - 15	Mon		<b>Fall Study Break - no classes</b>	-	
	Wed			-	
	Fri			-	
Nov 18 - 22	Mon	21	Muscle Physiology	20	
	Wed	22	Muscle Types & Energetics	20	
	Fri	23	Nutrition	19	
Nov 25 - 29	Mon	24	Feeding, Digestion, Absorption	19	
	Wed	25	Evolutionary Physiology and the way forward.	-	
	Fri	26	TBA		
Dec 2 - 6	Mon		RECITATION	-	
Dec 2 - 6	<b>TUES</b>		RECITATION (Last day of classes – Monday schedule)	-	

## 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](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](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](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](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](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](https://www.dal.ca/academics/important_dates.html)

**University Grading Practices**

[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)

**Missed or Late Academic Requirements due to Student Absence (policy)**

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html](https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html)

## **Student Resources and Support**

### **Advising**

**General Advising** [https://www.dal.ca/campus\\_life/academic-support/advising.html](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](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Students 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/current-students.html](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](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](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](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](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>