

**Faculty of Science Course Syllabus**  
**Department of Biology**  
**BIOL 3078 and MARI 3074**  
**Animal Physiology and Marine Animal Physiology, Part I**  
**Fall, 2016**

**Instructor(s):** Nina Hamacher; [NHamacher@dal.ca](mailto:NHamacher@dal.ca); room 3082  
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Dr. Nancy McAllister-Irwin; [irwinn@dal.ca](mailto:irwinn@dal.ca); room 6130

**Lectures:** M, W, F; 8:35 – 9:25 LSC 236

**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.

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**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
- Oral communication skills using various media (Powerpoint, videos, etc) of an article from the primary literature
- Discussion skills obtained in seminars

## 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
- Use of interactive simulations to integrate physiological concepts

## 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
- Human sensory physiology systems for vision (Snellen, astigmatism, Ichikawa, blind spot charts), hearing activity, touch, taste and smell tests
- Reflexes (patella, corneal, papillary, ciliospinal, consensual, vestibular)
- 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*. Third edition. 2012.

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

## Course Assessment

1 Mid-term lecture exam	25%
Laboratory assignments (reports, quizzes, exam)	35%
1 Student Seminar	15%
<u>1 Final lecture exam</u>	<u>25%</u>
Total	100%

The Mid-term exam will be 50 minutes long and will be scheduled during a lecture period. The Final 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. The student seminar is described in a separate handout. 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 your student seminar, mid-term exam or final exam. They will normally only be rescheduled for illness, and we will require a medical certificate from your doctor. 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 make-up exams for midterms or alternate dates for seminars, but will do so as long as the student presents us with a valid sick note.

**Course Content**
**Tentative Lecture Schedule BIOL 3078 and MARI 3074, Fall 2015**

Week of	Day	Lec. #	Topic	Ch.#	Lecturer
Sept 5 - 9	Wed		Introduction & Administration	-	Hamacher
	Fri	1	Function on the ecological stage - Animals, Environments & Evolutionary processes	1	
Sept 12 - 16	Mon	2	Homeostasis		
	Wed	3	Molecules & cells: Cell membranes and cell signaling	2	
	Fri	4	Molecules & cells: Enzymes	2	
Sept 19 - 23	Mon	5	Transport of solutes & water	5	
	Wed		1. Seminar on Cell membranes	-	
	Fri	6	Nervous systems & Neurons	12 & 15	
Sept 26 - 30	Mon	7	Neuronal function - Membrane potentials		
	Wed		2. Seminar on Enzymes	-	
	Fri	8	Action potential & Propagation of Action potentials	12 & 15	
Oct 3 - 7	Mon	9	Synapses	13	
	Wed	10	Sensory receptors	14	
	Fri		3. Seminar on Neurophysiology	-	
Oct 10 - 14	Mon		Holiday - no class	-	
	Wed	11	Audition	14	
	Fri	12	Audition - Hearing in Marine Mammals		
Oct 17 - 21	Mon		4. Seminar on Sensory systems	-	
	Wed	13	TBA	-	
	Fri		Midterm: Friday October 21st		
Oct 24 - 28	Mon	14	Vision	14	
	Wed	15			
	Fri	16	Endocrine physiology & Control of endocrine systems	17	
Oct 31 - Nov 4	Mon		5. Seminar on Hormones	-	
	Wed	17	Stress and Parental Care	17	
	Fri	18	Reproduction		
Nov 7 - 11	Mon		Holiday - no class	-	
	Wed			-	
	Fri			-	
Nov 14 - 18	Mon		6. Seminar on Reproduction	-	
	Wed	19	Reproduction of placental mammals I	17	
	Fri	20	Reproduction of placental mammals II		
Nov 21 - 25	Mon	21	Muscle types and contractions	20	

	Wed	22	Muscle energetics & Neural control of skeletal muscle	
	Fri	23	Control of movement	19
Nov 28 - Dec 2	Mon		7. Seminar on Muscles	-
	Wed	24	Nutrition	6
	Fri	25	Feeding, digestion, & absorption	
Dec 5 - 9	Mon	26	Evolutionary Physiology	-

### ACCOMMODATION POLICY FOR STUDENTS

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed here:

[http://www.dal.ca/dept/university\\_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html](http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html)

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the **Request for Accommodation** form are available at [www.dal.ca/access](http://www.dal.ca/access).

### ACADEMIC INTEGRITY

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (<http://academicintegrity.dal.ca>) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's **Policy on Intellectual Honesty** and **Faculty Discipline Procedures** is available here:

[http://www.dal.ca/dept/university\\_secretariat/academic-integrity/academic-policies.html](http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html)

### STUDENT CODE OF CONDUCT

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general:

"The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non – academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;

- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members.”

The full text of the code can be found here:

[http://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

## SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

Service	Support Provided	Location	Contact
<b>General Academic Advising</b>	Help with <ul style="list-style-type: none"> <li>- understanding degree requirements and academic regulations</li> <li>- choosing your major</li> <li>- achieving your educational or career goals</li> <li>- dealing with academic or other difficulties</li> </ul>	<b>Killam Library Ground floor</b> Rm G28 <b>Bissett Centre for Academic Success</b>	In person: Killam Library Rm G28 By appointment: <ul style="list-style-type: none"> <li>- e-mail: <a href="mailto:advising@dal.ca">advising@dal.ca</a></li> <li>- Phone: (902) 494-3077</li> <li>- Book online through MyDal</li> </ul>
<b>Dalhousie Libraries</b>	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	<b>Killam Library Ground floor</b>  Librarian offices	In person: Service Point (Ground floor)  By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: <a href="http://dal.beta.libguides.com/sb.php?subject_id=34328">http://dal.beta.libguides.com/sb.php?subject_id=34328</a>
<b>Studying for Success (SFS)</b>	Help to develop essential study skills through small group workshops or one-on-one coaching sessions  Match to a tutor for help in course-specific content (for a reasonable fee)	<b>Killam Library 3<sup>rd</sup> floor</b>  Coordinator Rm 3104  Study Coaches Rm 3103	To make an appointment: <ul style="list-style-type: none"> <li>- Visit main office (Killam Library main floor, Rm G28)</li> <li>- Call (902) 494-3077</li> <li>- email Coordinator at: <a href="mailto:sfs@dal.ca">sfs@dal.ca</a> or</li> <li>- Simply drop in to see us during posted office hours</li> </ul> <b>All information can be found on our website: <a href="http://www.dal.ca/sfs">www.dal.ca/sfs</a></b>
<b>Writing Centre</b>	Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) <ul style="list-style-type: none"> <li>- Learn to integrate source material into your own work appropriately</li> <li>- Learn about disciplinary writing from a peer or staff member in your field</li> </ul>	<b>Killam Library Ground floor</b> Learning Commons & Rm G25	To make an appointment: <ul style="list-style-type: none"> <li>- Visit the Centre (Rm G25) and book an appointment</li> <li>- Call (902) 494-1963</li> <li>- email <a href="mailto:writingcentre@dal.ca">writingcentre@dal.ca</a></li> <li>- Book online through MyDal</li> </ul> We are open six days a week <b>See our website: <a href="http://writingcentre.dal.ca">writingcentre.dal.ca</a></b>