

Faculty of Science Course Syllabus
Department of Biology
BIOL 3079 and MARI 3076
Animal Physiology and Marine Animal Physiology, Part II
Winter, 2017

Instructor(s): Dr. Alan Pinder; alan.pinder@dal.ca; room 4130

Dr. Nancy McAllister-Irwin; irwinn@dal.ca; room 6130

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

Laboratories: Room 7009, 3 hours

BIOL 3079

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

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

MARI 3076

B01: Wednesday, 1:30-4:30pm, Room 7009, Biology Department.

B02: Thursday, 10:00-1:00pm, Room 7009, Biology Department.

Course Description

This course is a continuation of a discussion of the mechanisms which coordinate the activities of cells within multicellular organisms which began in BIOL 3078.03/MARI 3074.03. This term emphasizes the urinary, cardiovascular and respiratory systems. The laboratories reflect the approaches taken to study these systems in a variety of organisms.

LECTURE HOURS PER WEEK: 3

LAB HOURS PER WEEK: 3

PREREQUISITES: [BIOL 3078.03](#) or [MARI 3074.03](#)

CROSS-LISTING: [MARI 3076.03](#)

EXCLUSIONS: [BIOA 3005.03](#)

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

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|---|------------|
| Problem sets | 15% |
| Participation | 5% |
| Laboratory assignments (reports, quizzes, exam) | 40% |
| <u>1 Final lecture exam</u> | <u>40%</u> |
| Total | 100% |

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. 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 final exam. It 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 3079 and MARI 3076, Winter 2017

| Week of | Day | Lec. # | Topic |
|----------------|-----|--------|---|
| Jan 9 - 13 | Mon | | Introduction & Administration |
| | Wed | | Water and Salt Physiology: Intro and Mechanisms |
| | Fri | | |
| Jan 16 - 20 | Mon | | Ionic and Osmotic Adaptation (freshwater, estuaries and shorelines) |
| | Wed | | Ionic and Osmotic Adaptation (marine) |
| | Fri | | Water Conservation in Terrestrial Animals |
| Jan 23 - 27 | Mon | | Excretory Organs |
| | Wed | | Regulating Filtration and Countercurrent Exchange |
| | Fri | | Renal Ion and pH Regulation |
| Jan 30 – Feb 3 | Mon | | Energy Metabolism: Intro |
| | Wed | | Metabolic rate 1 |
| | Fri | | Munro Day – no classes |
| Feb 6 - Feb 10 | Mon | | Metabolic Rate 2 |
| | Wed | | Aerobic and Anaerobic Forms of Metabolism |
| | Fri | | The Energetics of Aerobic Activity |
| Feb 13 - 17 | Mon | | Temperature and its effects |
| | Wed | | Thermal relations - Ectothermy |
| | Fri | | Thermal relations - Homeothermy |
| Feb 20 - 24 | | | Spring Break - no classes |
| Feb 27 – Mar 3 | Mon | | Warm-bodied fish and Insects |
| | Wed | | Life in the cold - Thermal adaptations |
| | Fri | | Oxygen and Carbon Dioxide Physiology |
| Mar 6 - 10 | Mon | | External Respiration: Intro |
| | Wed | | Breathing by Aquatic Invertebrates and Fish |
| | Fri | | Breathing by Terrestrial Animals other than Mammals |
| Mar 13 - 17 | Mon | | Breathing by Mammals |
| | Wed | | Blood gas transport: blood pigments |
| | Fri | | Carbon Dioxide Transport and Acid-Base Balance |
| Mar 20 - 24 | Mon | | Circulation: Myogenic and Neurogenic Hearts |
| | Wed | | Principles of Pressure, Resistance, and Flow in Vascular Systems |
| | Fri | | Circulation in Mammals and Birds |
| Mar 27 - 31 | Mon | | Circulation in Fish |
| | Wed | | Circulation in Invertebrates |
| | Fri | | Depth problems, Buoyancy, and Locomotion |
| Apr 3 - 7 | Mon | | Diving by Marine Mammals |
| | Wed | | TBA |
| | Fri | | TBA |
| Apr 10 | Mon | | TBA |
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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

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.

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

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

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