Mammalogy

BIOL 4123

Primary Instructor: Dr. Don Stewart (*He/Him/His*). (I hope to have guest lectures from former Acadia students now working in the field of mammalogy or other local experts in mammalogy.)

Office: Bio Building 434

Office hours: ~2:00-3:30 Tuesday and Thursday or by appointment

E-mail: don.stewart@acadiau.ca

Lecture: M/W/F, HSH 147, 10:30 AM - 11:20 PM

Lab: Th 1:00 PM - 3:50 PM. **Location:** Wildlife Museum located in the Basement of the Biology Building (Note: the online Course Catalogue on MyAcadia says the lab will be in Wolfville Main Campus Laboratory because it does not recognize the Wildlife Museum as a lab). **Some lab exercises will consist of short hikes around the Acadia campus (near lower soccer fields) to search for mammal sign and/or the Acadia hiking trails on the south side of campus. I also hope to have a field trip to the Kentville Mammal processing lab of the Nova Scotia Department of Natural Resources and Renewables. Finally, I am experimenting with some "take-home" lab exercises using skull specimens borrowed from the Acadia Wildlife Museum.**

Evaluation	Percentage	Date
Assignments	10%	TBD
Term Tests	25% (1st = 10%; 2nd = 15%)	Tentative dates: 27 September; 1 November
Presentation	15%	Last week or two of November
Final Exam	25%	TBD
Lab (including lab exam)	25%	
Lab exam		TBD (~end of November)

Part 1: Course Information

Course Description

Evolution, functional morphology, reproduction, physiology, evolutionary and behavioural ecology of mammals. Labs stress anatomy, functional morphology and identification. Field trips. (3h lab).

Prerequisites: BIOL 2073 with a minimum grade of C-.

Course Materials & Requirements

Textbook: None required.
Resources: We will base some lab exercises off chapters in the book R.E. Martin, R.H. Pine, A.F. DeBlase, 2001. A Manual of Mammalogy with Keys to Families of the World, 3rd Edition. WCB McGraw-Hill, Toronto. (Not in Bookstore). **Several copies will be present in the lab, and can be shared.** There is no need to buy this book unless.

The following books on Mammalogy will be placed on reserve at the library.
Feldhamer, G.A. et al. 1999. Mammalogy: Adaptation, Diversity, and Ecology. McGraw-Hill, Toronto.
Vaughan, T.A. et al. 2000. Mammalogy, 4th Ed.. Saunders (Harcourt) College Publishing, Toronto.

Readings: We will occasionally read current papers from the literature that complement the material in the lab manual and the lecture notes. These articles will accessible via ACORN.

Course Structure

This course will consist of lectures with student presentations at the end of term. Labs will emphasize mammal anatomy and physiology with a focus on learning mammals of the Atlantic region.

Student Learning Outcomes

People study mammals for a variety of reasons. These may be practical. We need to understand and manage mammals in the wild, as pets, and as domesticated farm animals. Wild and domestic mammals may harbour diseases that affect humans. Mammals are important in medical research. Mammals may also negatively impact human activities. We also may be interested in mammals for more academic reasons. Mammals can teach us a lot about the evolutionary process, for example. Given that we are mammals, the study of mammalogy can teach us much about human biology.

In this course we will address the following questions. What methods are used to study mammals? What constitutes the general mammalian body plan? How are the skulls, skeletons, digestive tracts, nervous system, reproductive systems, behaviours, etc. of the various mammals adapted to the diversity of lifestyles apparent in the class? In undertaking these comparative and integrative studies, we will survey the incredible diversity of mammalian families. By the end of the course, you will know the major lineages of mammals and their defining characteristics. We will also focus on the mammals of Atlantic Canada. If time permits, we will look at some special topics related to mammalogy (e.g., historical biogeography, parasites of mammals, mammalian conservation, and domestication of mammals).

How to Meet the Learning Outcome

To succeed in this course, you should come to lecture, read the read the assigned readings posted on ACORN, participate fully in discussions and be actively engaged in preparing your presentation.

Part 2: Topic Outline/Schedule

Topics to be covered:

Why study mammals?
Mammal Evolution and Feeding Modes
Adaptations of the skin

Reproduction – monotremes, marsupials, placentals.
Environmental adaptations
Skeleton and locomotion
Insectivores
Bats
Carnivores
Cetaceans
Paenungulates
Primates
Ungulates
Rodents and Lagomorphs

Student Presentations – paper critiques

Lab topics: Lab exercises will complement material covered in lecture. We will examine the skull, teeth, skeleton, skin, hair, horns and antlers, and other defining characteristics of mammals. Building on a basic knowledge of the mammalian body plan, we will then examine locomotory adaptations in mammals, adaptations of the integument (skin), and feeding adaptations. By the end of term, you should have a good knowledge of many of the native mammals of Nova Scotia. You should also be able to identify the skulls and skins of most terrestrial mammals (and some aquatic mammals) from this region. Depending on availability of material (frozen small mammal specimens) we will also prepare one or more museum study skins as part of your laboratory grade.

The instructor reserves the right to amend the above course plan with reasonable notice, and in consultation with the class. The exact number of topics covered may vary depending upon how quickly we cover the material.

Part 3: Assessment and Grading

General: You will be assessed on several assignments, two tests, a final exam (combination of short answer and essays), a presentation (critique of a scientific article on mammals), and attendance and participation in lab.
- One assignment will be a brief review of a Canadian mammalogist.
- The tests and final will be based on lecture material, required readings and assigned articles covered up to that point. The final exam will cover material from the entire term. The format for both exams will be a combination of short answer and essays.

Part 4: Course Policies

If you prefer not to participate in or observe mammal dissections, please let me know so that alternative activities can be arranged.

Part 5: University Policies

University policies are available in the Acadia University Academic Calendar or through the Registrar's website: https://registrar.acadiau.ca/welcometotheregistrarsoffice.html

Equity, Diversity and Inclusion

Acadia University is committed to becoming a culturally safe and anti-oppressive community. This can only be achieved where there are simultaneous efforts to eliminate all forms of discrimination and harassment from our campus community, including the elimination of all discrimination, harassment and

violence based on one's identity, including but not limited to, gender, race, class, ethnicity, sexual orientation, disability, gender identity, gender expression, and Indigeneity. The policy against harassment and discrimination, and resources for students who believe they may have experienced, or witnessed, discrimination or harassment, are available here: https://www2.acadiau.ca/student-life/equity-judicial/equity.html

Last Drop Day

Last day to drop a course and receive a "W". Please check the Acadia University calendar dates, which are available here: https://registrar.acadiau.ca/AcademicCalendars.html

Inform Your Instructor of Accommodations

Acadia University is dedicated to improving access to campus life for all students with disabilities. While we attempt to ensure that all courses are accessible, we recognize that there are barriers that need to be addressed on an individual basis. Students who require accommodations to complete coursework or otherwise fully participate in class should contact Accessible Learning Services directly as soon as possible. https://www2.acadiau.ca/student-life/accessiblelearning.html

The Use of Animals in Teaching and Research

The use of animals in teaching and research at Acadia University is done in accordance with guidelines on the care and use of animals published by the Canadian Council on Animal Care (CCAC). For more information on the CCAC, please visit their website at http://www.ccac.ca

Commitment to Integrity

It is standard practice in Biology to check exams and assignments for cheating and plagiarism. Cheating in the class and/or lab, including plagiarism, will not be tolerated. Please read the appropriate sections of the current Acadia University Academic Calendar: https://registrar.acadiau.ca/AcademicCalendars.html

Information on copy-write and course content from Acadia University is available through the Vaughan Memorial Library: http://libguides.acadiau.ca/c.php?g=433650&p=5027078

The spoken and written course content (including the syllabus, handouts, lectures, presentations, labs, assignments, quizzes, tests, and exams) are the intellectual property of the instructor and may only be copied for personal use. Sharing these materials or uploading them where they may be accessed by others is a violation of copyright. If you wish to make audio, video, or photographic recordings in class, you must first obtain the consent of the instructor and of any other persons (e.g., guest speakers, other students) who may be captured in such recordings. In the case of personal use by students with disabilities, the instructor's consent shall not be unreasonably withheld.

Part 6: Program Learning Outcomes

Foundations of knowledge		**Course specific examples**	**Proficiency** 1-Introduction 2-Reinforcement 3-Proficient
Scientific method, inquiry and hypothesis testing	Find, understand and apply information from the literature; understand how to use the scientific method to examine problems from different perspectives	Review and critique methods used to study mammals based on the current literature	2
Historical concepts and contributions by important figures	Explain foundational concepts in biology, Two-eyed Seeing, and ethical implications of scientific discoveries	Write short review of a Canadian Mammalogist	2
Biodiversity and ecology	Understand the genetic, taxonomic and ecosystem levels of biodiversity; focus on SW Nova including the Acadian Forest and Bay of Fundy ecosystems	Extensive exploration of the diversity of the group including variation in anatomy, physiology, behaviour, and ecology	3

Genetics and evolution	Understand the chemical basis of heredity, genetics and genomics; integrate concepts across disciplines to understand evolution	Each class starts with a review of the phylogenetic position of the group being discussed	3
Human and environmental health	Understand form and function in health and disease within a One Health framework, integrating human and environmental health	Discuss threats to mammals related to habitat loss, disease, invasive species, etc.	2
Lab and field skills			
Experimental design	Gain experience in applying the scientific method	Students will critique methods used to study mammals in an example from the recent literature	2
Safety	Work safely and productively in lab and field settings	Gloves and eye protection required when dissecting mammals (risk of zoonoses).	1
Lab skills	Gain experience with basic and advanced lab techniques and understand their application in research, health science and industry	Dissection of a small mammal; prepare museum specimen	2
Field skills	Gain experience in basic and advanced field skills and understand their application in ecology, conservation biology and environmental change	Identifying mammal sign in the field; identifying mammal trails; droppings	1
Data acquisition, analysis and interpretations	Collect data, present results both qualitatively and quantitatively, and interpret outcomes in light of the literature	Use calipers to measure teeth and skulls; ruler to measure gross morphological characters and an electronic scale to measure mass	2
Statistical analysis	Use R and or other programs to analyze biological data	Methods discussed as part of a review of a recent primary publication on Canadian mammals	1
Professional skills			
Ethical practices	Demonstrate ethical conduct, apply principles of academic integrity and understand the principles of EDI in science	Discuss role of CCAC in using animals in teaching and research at Acadia and Canadian universities generally	2
Collaboration and group work	Work effectively in groups within and across disciplines		3
Critical thinking	Analyze and evaluate information to make science-based decisions	Critique methods for studying mammals	2
Computer proficiency	Use common and discipline- specific software	Give a class presentation	2
Scientific communication	Communicate science effectively to both scientific and general audiences	Give a presentation to the class on a recent primary publication in mammalogy	2