

Faculty of Science Course Syllabus
Department of Biology
Mari 3090
Marine Mammalogy
Winter 2018

Instructor(s): *Tonya Wimmer / Damian Lidgard* twimmer@dal.ca / dlidgard@dal.ca LSC 3076

Lectures: MWF 1435-1525pm *Location: LSC 240*

Laboratories: *N/A*

Tutorials: *N/A*

Course Description

The course will examine the characteristics that mammals brought with them when they returned to the ocean, the evolution of the different groups of marine mammals, some of their special adaptations, the roles of marine mammals in oceanic ecosystems and general principles of marine mammal population biology. Students will use information on the biology of marine mammals to explore conservation/management issues.

Course Prerequisites

BIOL 2060.03 (or BIOA 3001.03)

Course Objectives/Learning Outcomes

Student learning outcomes that are covered by this course.

1. Describe the differences and similarities between marine and terrestrial mammals and their relative ecological importance (1, 2, 4, 5; tagwords: adaptation, animal, Animal Behaviour, biodiversity, diversity, terrestrial, vertebrate, marine mammals, communities, connectivity, ecosystems, populations, conservation, taxonomy, Natural Selection, niche, ecology, food webs, habitat, function, conservation, management)
2. Understand the origins, taxonomic diversity, structure and ecological importance of the marine mammal orders and families (1, 2, 4; tagwords: adaptation, animal, Animal Behaviour, biodiversity, Fossil Record/Paleontology, evolution, diversity, vertebrate, marine mammals, communities, connectivity, ecosystems, populations, conservation, taxonomy, Natural Selection, niche, ecology, food webs, habitat, function, conservation, management)
3. Recall the general biology of marine mammal taxa (tagwords: adaptation, animal, Animal Behaviour, biodiversity, marine mammals, communities, connectivity, ecosystems, populations, conservation, taxonomy, Natural Selection, niche, ecology, food webs, habitat)
4. Understand the meaning of life history and the life history characteristics of cetaceans and pinniped and the factors that shape their evolution (1, 2, 8; tagwords: adaptation, animal, Animal Behaviour, Fossil Record/Paleontology, marine mammals, sexual selection, reproduction, life history, populations, ecology, function, conservation, physiology, morphology, Field Methods, observation, sampling, surveys)

5. Understand how marine mammal abundance is measured and the significance of life history parameters in population dynamics and have a basic understanding of the factors which contribute to the formation of new colonies (1, 7, 8; tagwords: animal, Animal Behaviour, marine mammals, Sexual selection, reproduction, life history, populations, ecology, hormones, Field Methods, observation, sampling, surveys)
6. Understand how social systems have evolved, the types of social systems in marine mammals and the evolution of mating strategies as an example of a social system Describe the influence of social structure on vocal categories (1, 2, 4; tagwords: animal, Animal Behaviour, anthropogenic impact, marine mammals, field methods, observation, sampling, surveys, Sexual selection, reproduction, life history, populations, ecology, communities, connectivity, ecosystems, populations, conservation)
7. Basic understanding of sound propagation in water, fundamental sound component analysis (e.g. amplitude, frequency), sound production and receiving mechanisms in various marine mammal taxa and the impacts harmful sound can have on populations (3, 5, 7, 9; tagwords: adaptation, animal, Animal Behaviour, anthropogenic impact, biotechniques, marine mammals, conservation, physiology, morphology, function, disturbance, human impacts, conservation, management)
8. Basic understanding of optimal foraging theory, the pros and cons of dietary techniques for estimating diet and the importance of the development of new technologies (1, 2, 4; tagwords: adaptation, animal, Animal Behaviour, biotechniques, marine mammals, Field Methods, observation, sampling, surveys, communities, ecosystem, food web, populations, Physiology, morphology, function)
9. Being aware that science, law and politics play an important role in the conservation and management of marine mammals, threats they face and mitigation options (3, 5, 7, 9; tagwords: animal, Animal Behaviour, anthropogenic impact, marine mammals, conservation, ecology, populations, communities, disturbance, human impacts, conservation, management, historical background, sustainability, extinction)
10. Basic understanding of the concepts and role genetics plays in conservation of marine mammals (1, 2, 4; tagwords: adaptation, animal, Animal Behaviour, anthropogenic impact, biodiversity, biotechniques, Genetics, heredity, phylogeny, forensics, conservation, DNA, Field Methods, sampling, pedigree, evolution, reproduction, conservation, diversity, molecular evolution, marine mammals, field Methods, observation, sampling, surveys)
11. Understanding the evolutionary physiological adaptations in marine mammals to adapt to diving, cold and swimming (1, 2, 4; tagwords: adaptation, animal, Animal Behaviour, anthropogenic impact, marine mammals, physiology, morphology, function)
12. Evaluate scientific data, opinions and theories with respect to a scientific or conservation questions (6, 10; tagwords: data interpretation, scientific writing, report, observations, science communication, marine mammals)

Course Materials

No supplementary materials

Course Assessment

For the term project, you will choose a topical issue to examine from a *practical* perspective. For most topics, you will be asked to weigh an issue related to marine mammal conservation, ethics, research etc. and to provide advice to an “organization” and make a management and/or conservation recommendation.

****You need to indicate your order of preference for all 15 topics by Friday 12 January 2018**** A list of the issues will be available online by the second day of classes.

These topics are all current and hotly debated issues. For the term projects, you will be required to work as a group, in pairs and individually to complete the various components. Each topic will be examined by a maximum of **four** students, whom will work **individually** to create an outline (see Assignment #1) and deliver a final paper (see Assignment #2) and as an **assigned group and pairs** to deliver a presentation debate on the topic (see Assignment #3).

Details of the three assignments are as follows:

1. Create an outline with references – Due **Friday 26 January 2018 by 4:30 pm**

This assignment will be conducted **individually**. First, research the basic information surrounding the issue. From this, make an outline of the information you will need to thoroughly research on the issue from a scientific standpoint. List all of the relevant parts of your report in order, while also considering how you will organize your final report (see below). The outline should be no more than 2-3 pages, single-spaced text (letter sized page, size 12 font). The report is to be submitted as a word file (.doc) to Brightspace, named as: Student Name_Outline.doc **You will need to include at least five key references, formatted in the correct manner as described below.**

2. Write a final report – Due **Wednesday 7 March 2018 by 4:30 pm**

This assignment will be conducted **individually**. Each member of the group is required to write an individual final report. Do not write this report together, rather consider this your opportunity to evaluate the topic and feel open to take a different viewpoint to your partners. The report should summarize the different sides of the issue, provide the scientific background (e.g. biology of species concerned relevant to the issue, action of threats), and explain what action you think should be taken and why. Make sure you focus on your specific question and give only **relevant** background information. The report should be a document that can be read quickly and easily by the “executive of the organization” that commissioned the report.

Maximum length: 5 single-spaced pages (letter sized page, size 12 font) including a 200-word (maximum) summary, excluding the reference list, figures and tables. Tables and figures must be labelled correctly (with descriptive titles, located *above* the tables or *below* the figures, and referenced if from another source). The report is to be submitted as a word file (.doc) to Brightspace, named as: Student Name_Final.doc

Notes on References:

For the outline and final report, cite and list sources in the correct format, i.e. according to the Canadian Journal of Zoology format. Wherever possible cite references from peer reviewed journals, and avoid references from grey literature (i.e. reports, theses, government documents etc.). For opinions, concerns, or legal information you can cite internet sources (in the correct format!). If you're unsure of how to format a reference, talk to your TA. The order of preference for sources of information is:

- a) Published, peer-reviewed primary or review journals (e.g. *Canadian Journal of Zoology*, *Nature*)
- b) Edited collections of papers (e.g. "*Handbook of Marine Mammals*" series)
- c) Non- peer reviewed journals and technical reports (e.g. *Scientific Reports of the Whales Research Institute of Tokyo*)
- d) Scientific books (e.g. "*The ecology of whales and dolphins*")
- e) Semi-popular journals (e.g. *Oceanus*, *Scientific American*)
- f) Semi-popular books (e.g. "*Seals of the World*")
- g) Published abstracts (e.g. from *Biennial Marine Mammal Conferences*)
- h) Internet (unless reproduction of something in one of categories above), popular books, etc.

Wikipedia, lecture notes or spoken words from a lecture are not valid references**3. Design and Give a Debate Presentation – to be presented during the period **28 March – 6 April 2018****

Each debate will involve three groups of students: a group of two students that will support one side of the issue (Side 1), an opposing group that will support the other side of the issue (Side 2), and a group of four students that will pose questions and judge the quality of the arguments and performance of the debate (the 'judges'). If there is time, questions may also be posed by the class audience. Given the size of the class, students will be assigned to 2 different rooms.

Individuals will be assigned to their debate room, group and the side of the debate randomly by the professors (to be done by 7 March 2018).

You will present and attend presentations in the same room for the entire four days of student presentations. You will only be asked questions on the final exam from the room to which you were assigned.

The format of the debate will be as follows:

Student A from Side 1 will present their argument (3 minutes)

Student A from Side 2 will present their argument (3 minutes)

Student B from Side 1 will present further arguments, highlight issues with the opposing team's arguments and address questions that may have been raised by the opposite side (3 minutes)

Student B from Side 2 will present further arguments, highlight issues with the opposing team's arguments and address questions that may have been raised by the opposite side (3 minutes)

*** It is recommended to use a Powerpoint presentation for delivering the arguments. Be sure to provide a review of your main pro/con arguments, your scientific support and your recommendations***

Students from Side 1 of the debate now present a rebuttal to arguments raised by the second, opposing side (2 minutes)

Students from Side 2 of the debate present their rebuttal to arguments raised by the first side (2 minutes)

After the presentation, the two sides will be open to questions from the judges (~8 minutes)

***Each of the four judges will be required to ask at least one question. Students will be assigned to a particular day for which they are responsible for asking questions following student presentations. Student participation as judges is mandatory and part of your final grade. ***

After the judging period, questions will open to the class followed by a vote on which side performed the best. However, no marks will be awarded to the successful team.

Finally, judges and the instructor will provide a grade for each side of the debate based on arguments given and performance; the final grade will be an average of these grades.

MIDTERM (one hour) – 14th February 2017

A series of short-answer style questions on topics covered in lectures up to and including **12th February 2017**.

FINAL EXAM (one hour) – 9th April 2017

On the final day of class, a series of short-answer questions on topics covered in lectures and student presentations, from **16th February to 6th April** inclusive. You will only be asked questions on the student presentations given in your room.

Component	Weight (% of final grade)	Date
<i>Midterm exam</i>	20%	Feb 14 th
<i>Final exam</i>	20%	In Class, April 9 th
<i>Paper Outline</i>	10%	January 26 th
<i>Final paper</i>	30%	March 7 th
<i>Presentation</i>	15%	March 28 th – April 6 th
<i>Participation</i>	5%	March 28 th – April 6 th

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

All assignments must be submitted to Brightspace (as a .doc file) by 4:30 p.m. on the due date. 10% will be taken off for each day late until the assignment is handed back in class, after which a 0 will be given (except for legitimate medical reasons). If you're not going to be able to hand in assignment on the day it's due or attend an exam, email one of the professors immediately prior to the deadline/exam date to make alternative arrangements (if excuse is valid).

Course Content (Approximate Schedule)

8 Jan: Introduction to class and assignments
 10 Jan: Diversity of Marine Mammals
 12 Jan - 26 March: Attributes of Marine Mammals
 14 Feb: Midterm
 28 Mar – 6 Apr: Student presentations (debates)
 9 Apr: Final Exam

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

COPYRIGHT

All members of the Dalhousie community are expected to comply with their obligations under Canadian copyright law. Dalhousie copyright policies and guidelines, including our Fair Dealing Guidelines, are available at: <https://libraries.dal.ca/services/copyright-office.html>. Copyright questions should be directed to the Copyright Office at copyright.office@dal.ca.

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 	Student Union Building Bissett Student Success Centre Rm 426	In person: Student Union Building, Rm 426 By appointment: <ul style="list-style-type: none"> - e-mail: advising@dal.ca - Phone: (902) 494-3077
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: Contact by email or phone to arrange a time: https://libraries.dal.ca/help/ask-us.html
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)	Student Union Building Bissett Student Success Centre Rm 426	To make an appointment: <ul style="list-style-type: none"> - Visit main office (SUB, Rm 426) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or Additional information: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring/contact-us.html
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 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 website See our website: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Questions?

Visit forums on Brightspace and send messages using the message tool.