

**Dalhousie University**

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq.  
We are all Treaty people.<sup>1</sup>

Faculty of Science/Department of Biology

# MARI 3090: Marine Mammalogy

## Winter 2022

MWF 16:35-17:25, LSC C338 (lecture)

### COURSE INFORMATION

#### Instructor Information

- **Instructor:** Dr. Amanda Babin (she/her)
- **Office:** Virtual (see email)
- **Office Phone:** Not applicable
- **Office Hours:** Virtual MWF 9:00-16:30
- **Email:** Amanda.Babin@dal.ca

It is important that students communicate with the instructor when clarification about course content and assignments is needed, to resolve any conflicts around group assignments, and if a student anticipates difficulties meeting course deadlines for any reason. Please feel comfortable to reach out to the instructor at any time for any reason. Virtual office hours will be held on class days (MWF) from 9:00 to 16:30 during which time the instructor will monitor email messages and Brightspace discussions. TAs do not hold office hours, but also please feel free to contact the TAs via email. If a student would like to have a discussion rather than conversing over email, please contact the instructor to schedule a time to speak over the phone, over a video chat (Zoom), or in person. Students can expect a response to any email within 36 hours during workdays. In the case of class cancellations, the instructor will email the class and post a message on Brightspace.

|                     |                   |                          |
|---------------------|-------------------|--------------------------|
| <b>TA</b>           | Natalie Colbourne | Kathleen McVittie        |
| <b>Email</b>        | nt979538@dal.ca   | kathleen.mcvittie@dal.ca |
| <b>Office</b>       | Virtual           | Virtual                  |
| <b>Office Hours</b> | Not applicable    | Not applicable           |

#### Course Description

This course examined the characteristics of marine mammals, the roles of marine mammals in oceanic ecosystems and general principles of marine mammal population biology. Students use information on the biology of marine mammals to explore conservation/management issues. They learn of these animals and explore how they interact with humans.

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<sup>1</sup> For more information about the purpose of territorial acknowledgements, or information about alternative territorial acknowledgements if your class is offered outside of Nova Scotia, please visit <https://native-land.ca/>.

### **Description of Class Format**

This course will be in-person whenever possible (otherwise online and synchronous) and lecture-based with questions and discussion being encouraged. The main concepts will be covered in lectures by the instructor, but there will also be numerous guest lecturers speaking of their expertise. There will also be peer-learning through the students giving two group presentations, one at the beginning and one at the end of the course. The first group presentation requires being in-person, and if this is not possible at the time then an alternate assignment will be assigned. If there are technology issues during any online course time, please contact the instructor so that accommodations can be made (such as questions about powerpoint lecture, make-up tests, etc.)

### **Minimal Technical Requirements**

Access to university library, Brightspace, and email services are required for this course, accessed either through a university or personal computer. A mic and webcam along with Zoom software may also be necessary if the second group presentation must be done online. Brightspace course: MARI3090 – Marine Mammalogy (Sec 1) – 2022 Winter (<https://dal.brightspace.com/d2l/home/201911>)

### **Learning Management System Site Information**

Core course content will be accessible on Brightspace. Lectures will be posted on Brightspace beforehand. Students will also use Brightspace to submit assignments, and can use the discussion page to reach the instructor.

### **Course Pre-requisites**

2060.03 (or BIOA 3001.03)

### **Course Rationale and/or Other Restrictions and Requirements**

Students are required to give adequate time to individual and group assignments outside of classroom time. They are also expected to submit written assignments according to their best understanding of the conventions of scientific writing. Do not use colloquialisms or informal speak and make sure your sentences are grammatically correct.

### **Course Learning Outcomes**

Upon completion of this course, students will be able to:

1. Describe the differences and similarities between marine and terrestrial mammals, including the evolutionary physiological adaptations that allow mammals to live in salt (and some fresh) water
2. Understand the origins, taxonomic diversity, and structure of the marine mammal orders and families
3. Be able to identify key characteristics of local marine mammal species
4. Understand the biology and ecology of marine mammals, including their roles in oceanic ecosystems
5. Understand the life history characteristics of cetaceans and pinnipeds
6. 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
7. Describe the types of marine mammal social systems and mating strategies, and how these influence vocal categories
8. Demonstrate a 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 individuals and populations
9. Demonstrate a basic understanding of optimal foraging theory
10. Demonstrate a basic understanding of laws relevant to marine mammal conservation and protections, and the role of genetic research in these efforts
11. Understand topics presented by experts in the marine mammal scientific field
12. Evaluate scientific data and theories with respect to scientific or conservation questions
13. Demonstrate critical thinking, and scientific research and writing skills

**Required Text(s)**

There are no required texts for this course.

**Course Schedule:** in-person when possible, otherwise online and synchronous

| Class Dates | Lecture/Activity                               | Assignments  |
|-------------|--|--|
| Jan 5, W    | Syllabus and Diversity discussion              |  |
| Jan 7, F    | Introduction and Identification                |  |
| Jan 10, M   |  | Diversity presentations due by 14:00 (2pm)             |
| Jan 12, W   | Diversity overview, Evolution                  | Term project topic preference order due by 14:00 (2pm) |
| Jan 14, F   | Adaptations                                    | Drop date w/o financial implications                   |
| Jan 17, M   | Feeding Ecology                                |  |
| Jan 19, W   | Behaviour and social systems                   |  |
| Jan 21, F   | Life History and Reproduction                  | (Literature review due by 14:00 (2pm), if applicable)  |
| Jan 24, M   | Anatomy  |  |
| Jan 26, W   | Sensory systems                                |  |
| Jan 28, F   | Bioacoustics                                   | Drop date w/o a "W"                                    |
| Jan 31, M   | Human Interactions                             | Research outline due by 14:00 (2pm)                    |
| Feb 2, W    | Population Biology                             |  |
| Feb 4, F    | Munro Day (closed)                             |  |
| Feb 7, M    | Species At Risk Act                            |  |
| Feb 9, W    | Marine mammal response                         |  |
| Feb 11, F   | Current Research Techniques                    |  |
| Feb 14, M   | Any remaining lecture material                 |  |
| Feb 16, W   | Review day                                     |  |
| Feb 18, F   |  | Midterm exam 16:35-17:35 (1 hour)                      |
| Feb 21, M   | Nova Scotia Heritage Day (closed)              |  |
| Feb 23, W   | Study Break                                    |  |
| Feb 25, F   | Study Break                                    |  |
| Feb 28, M   | <b>Chris Harvey-Clark, marmam vet. science</b> |  |
| Mar 2, W    | <b>Hal Whitehead, cetacean culture</b>         |  |
| Mar 4, F    | Lori Marino, marmam neurobiology and WSP       | Research paper due by 14:00 (2pm)                      |
| Mar 7, M    | <b>Hilary Moors-Murphy, beaked whales</b>      | Drop date w/ a "W"                                     |
| Mar 9, W    | Brenna Frasier, walruses                       |  |
| Mar 11, F   | Tim Frasier, marmam genetics                   |  |
| Mar 14, M   | Damian Lidgard, seals                          |  |
| Mar 16, W   | Natalie Colbourne, pilot whales                |  |
| Mar 18, F   | Kathleen McVittie                              |  |
| Mar 21, M   | Guest lecture TBD                              |  |
| Mar 23, W   |  | Term Presentations due by 14:00 (2pm)                  |
| Mar 25, F   |  | Term Presentations                                     |
| Mar 28, M   |  | Term Presentations                                     |
| Mar 30, W   |  | Term Presentations                                     |
| Apr 2, F    |  | Term Presentations                                     |
| Apr 4, M    | Review day                                     |  |
| Apr 6, W    | Review day                                     |  |

## Course Assessments

| Assessment   | Date of Evaluation       | Weight     |
|--|--------------------------|------------|
| Diversity Presentation<br>(if online, Literature Review) | Jan 10, M<br>(Jan 21, F) | 5%<br>(5%) |
| Research Outline   | Jan 31, M                | 10%        |
| Midterm Exam   | Feb 18, F                | 15%        |
| Research Paper   | Mar 4, F                 | 20%        |
| Term Presentation  | Mar 23 (W)-Apr 2 (F)     | 20%        |
| Final Exam   | TBD                      | 30%        |

## Rubrics

- Collaboration (in-person and/or online) is required for the diversity and term presentations to ensure comprehensive understanding among all participants in the group, adequate preparation of the powerpoint which integrates sections that do not vary substantially in style, and submitting the assignments (by one student in the group).
- Exams will be synchronous and in-person proctoring will be used if possible

### Diversity Presentation (5%)

- Marked individually
- 2 min maximum
- Submit a powerpoint presentation by 14:00 (2pm) on January 10<sup>th</sup> on Brightspace, named as “Student Name\_Student Name\_Student Name\_Species.pptx”
- Introduction slide with student names and numbers – 1 pt
- Species taxonomy, Habitat, and Unique characteristic clearly shown and spoken about – 3 pts
- Photo credits and at least one proper reference – 1 pt

### Alternate - Literature Review (5%)

- This assignment will replace the Diversity Presentation if the course is taking place online at the time
- Marked individually
- 5-page maximum
- Submit the literature review by 14:00 (2pm) on January 21<sup>st</sup> on Brightspace, named as “Student Name\_Literature Review.docx”
- Two peer-reviewed publications from the MARMAM archive list published in 2021 or 2022 properly referenced – 1 pt
- Summary of each publication including brief Introduction, Methods, Results, and Discussion – 3 pts
- Conclusion written from the student’s perspective on the importance of these publications and how they progress the field of marine mammal science – 1 pt

### Research Outline (10%)

- Marked individually
- 2-page maximum (excluding references)
- Submit the outline by 14:00 (2pm) on January 31<sup>st</sup> as a Word file to Brightspace, named as “Student Name\_Outline.docx”
- Topic given a unique title, student name and number included – 1 pt
- Bullet points no more than 3 levels deep and in logical order – 1 pt
- All relevant information covered clearly, including case studies when applicable – 4 pts
- At least five proper references – 3 pts
- Within page limit and proper formatting (single-spaced, 12-point font) – 1 pt

#### Research Paper (20%)

- Marked individually
- 5-page maximum (excluding references)
- Submit the research paper by 14:00 (2pm) on March 4<sup>th</sup> as a Word file to Brightspace, named as “Student Name\_Research Paper.docx”
- Title matching outline, student name and number included – 1 pt
- All sections included (abstract, introduction, methods, results, discussion, references) in a scientific writing style without slang or grammatical errors – 2 pts
- Abstract well summarized in 200 words or less – 2 pts
- Introduction provides background information and a thesis statement at the end – 3 pts
- Methods give a brief overview of techniques relevant to the topic, or if the topic does not have methods then summarize how the student found research information relevant to the topic – 2 pts
- Results – Main points logically ordered from broad to specific, covering all relevant information, and including at least one case study when applicable – 3 pts
- Discussion – covers the implications of the results on the topic species, or the importance of those results on the environment – 3 pts
- References – at least 5 proper references beyond the 5 references included from the outline, including in-text citations – 3 pts
- Within page limit and proper formatting (single-spaces, 12-point font) – 1 pt

#### Term Presentation (20%)

- Marked individually
- 12 min maximum (+3 min questions)
- Submit a powerpoint presentation by 14:00 (2pm) on March 23<sup>rd</sup> to Brightspace, named as “Student Name\_Student Name\_Student Name\_Student Name\_Topic.pptx”
- Introduction slide with a unique title different from the individual research papers, and student names and numbers – 1 pt
- Main points clearly covered in logical order and integrated together rather than splitting into distinct sections – 12 pts
- Photo credits and at least 10 proper references that do not need to be unique from the research papers – 3 pts
- Easy to understand (volume, eye contact, notes not read word-for-word) – 1 pt
- Within time limit – 2 pts
- Handled questions well – 1 pt

#### Midterm Exam (15%)

- 15 short-answer questions – 1 pt each

#### Final Exam (30%)

- The final exam format will have five sections covering both lecture topics, guest lecture topics, and student presentations
- Identification
  - o 10 pictures – 1 pt each
  - o 5 audio recordings – 1 pt each
  - o 5 skeletal parts – 1 pt each
- 10 fill-in-the-blank questions – 2 pts each
- 10 definitions with examples – 2 pts each
- 4 short-answer questions with examples – 5 pts each
- 1 page essay (introduction with thesis statement of points to be discussed, body of essay with explanations and examples, conclusion) – 20 pts

## Reference formatting

Cite and list sources according to the Canadian Journal of Zoology format:

In the main body of text, cite as:

Monckton et al. (2020) states that taxonomic information is important for research replicability.

or

Taxonomic information is important for research replicability (Monckton et al. 2020).

In the alphabetical reference list:

Monckton, S.K., Johal, S., and Packer, L. 2020. Inadequate treatment of taxonomic information prevents replicability of most zoological research. *Can. J. Zool.* **98**(9): 633-642. doi:10.1139/cjz-2020-0027.

Wherever possible, cite references from peer-reviewed journals and avoid references from grey literature (*i.e.*, reports, theses, government documents). The order of preference for sources of information is:

- 1) Published, peer-reviewed primary or review journals (*e.g.*, Canadian Journal of Zoology, Nature)
- 2) Edited collections of papers (*e.g.*, Handbook of Marine Mammals series)
- 3) Non-peer-reviewed journals and technical reports (*e.g.*, Scientific Reports of the Whales Research Institute of Tokyo)
- 4) Scientific books (*e.g.*, The Ecology of Whales and Dolphins)
- 5) Semi-popular journals (*e.g.*, Oceanus, Scientific American)
- 6) Semi-popular books (*e.g.*, Seals of the World)
- 7) Published abstracts (*e.g.*, from Biennial Marine Mammal conferences)

Please ask if there are any sources you would like to include but are unsure of the citing format.

Note that Wikipedia, lecture notes, or spoken words from lectures are not valid references.

Photo credits:

Photographers name or url beside the photo

Use photos from here

[https://www.google.com/search?as\\_st=y&tbm=isch&hl=en&as\\_q=image&as\\_epq=&as\\_oq=&as\\_eq=&cr=&as\\_sitesearch=&safe=images&tbs=sur:f](https://www.google.com/search?as_st=y&tbm=isch&hl=en&as_q=image&as_epq=&as_oq=&as_eq=&cr=&as_sitesearch=&safe=images&tbs=sur:f)) or from books.

The Dalhousie University [Fair Dealing Policy](#) provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie.

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

|           |          |           |         |           |         |          |         |
|-----------|----------|-----------|---------|-----------|---------|----------|---------|
| <b>A+</b> | (90-100) | <b>B+</b> | (77-79) | <b>C+</b> | (65-69) | <b>D</b> | (50-54) |
| <b>A</b>  | (85-89)  | <b>B</b>  | (73-76) | <b>C</b>  | (60-64) | <b>F</b> | (<50)   |
| <b>A-</b> | (80-84)  | <b>B-</b> | (70-72) | <b>C-</b> | (55-59) |          |         |

## Course-specific policies

- Attendance for the diversity and term presentations, and the midterm and final exams, is compulsory. If you cannot attend for any reason, contact the instructor as soon as possible.
- If there are technology issues during any online course time, please contact the instructor so that accommodations can be made (such as questions about powerpoint lecture, make-up tests, etc.). Technology issues requiring make-up work will not come with penalties.

- All assignments to be submitted must be uploaded to Brightspace by the deadlines given in the schedule above and in the course overview. Submissions that are not uploaded by the due date and time will lose 5%, and by midnight on the respective due dates will lose 10%. For the written assignments and the term presentation, each day that the assignment is late will lose 10% per day for three days, after which a zero will be given.
- If you require an extension, please contact the instructor and submit a Student Declaration of Absence form on Brightspace (<https://cdn.dal.ca/content/dam/dalhousie/pdf/campuslife/Health%20and%20wellness/FINAL%20Student%20Declaration%20of%20Absence%20Form.pdf>). This form can be submitted up to two times during the semester and will not impact the academic requirements of this course if the reason is valid.
- Plagiarism will be checked by the detection software Urkund.
- Any guest lectures given virtually may be recorded. These recordings will only include the guest lecturer and maybe the instructor, but will not include students. The Classroom Recording Protocol will be followed ([https://www.dal.ca/dept/university\\_secretariat/policies/academic/classroom-recording-protocol.html](https://www.dal.ca/dept/university_secretariat/policies/academic/classroom-recording-protocol.html)).
- Please note that some class material may include photos that could trigger responses due to the realities of the natural world, including necropsy photos or videos.

### University Policies and Statements

- 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)) ([https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html))
- Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.
- 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 ([https://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html))
- 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 (Strategic Priority 5.2) (<http://www.dal.ca/cultureofrespect.html>)
- 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 ([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))
- The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the [Student Submission of Assignments and Use of Originality Checking Software Policy](#). Students are free, without penalty of

- grade, to choose an alternative method of attesting to the authenticity of their work, and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method.
- The Dalhousie University [Fair Dealing Policy](#) provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie.
  - These course materials are designed for use as part of the Course Code at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.
  - At Dalhousie, “[thinking and acting globally](#)” enhances the quality and impact of education, supporting learning that is “interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders.”
  - 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) ([https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html))

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation.

If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion please contact:

- the [Student Accessibility Centre](#) (for all courses offered by Dalhousie with the exception of Truro)
- the [Student Success Centre in Truro](#) for courses offered by the Faculty of Agriculture

Your classrooms may contain accessible furniture and equipment. It is important that these items remain in place, undisturbed, so that students who require their use will be able to fully participate.

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)

## **University Policies, Guidelines, and Resources for support**

The University Policies, Guidelines and Resources for Support and their respective links will be made available on the [Centre for Learning and Teaching \(CLT\) website](#), on the homepage of the [Learning Management System \(LMS\)](#) and on the [Dalhousie Academic Support website](#).

Dalhousie courses are governed by the academic rules and regulations set forth in the [Academic Calendar](#) and the [Senate](#).

## **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>

Dalhousie COVID-19 information and updates: <https://www.dal.ca/covid-19-information-and-updates.html>