

# Marine Mammal Biology

Aquatic Animal Health Distance Education Program  
University of Florida College of Veterinary Medicine

## Course Information

Summer 2024 (3 credits)

VME 6014: section 20612 (*UF students*); section 20613 (*non-UF students*), section 20614 (*Care & Conservation of Aquatic Animals Certificate students*)

## General Information

### Course Coordinator:

Dr. Jonathan Cowart, PhD

Office hours: By appointment only

Email: [jrc8462@ufl.edu](mailto:jrc8462@ufl.edu)

### Guest lecturers:

**Mark Uhen** (*George Mason University*), **Joy Reidenberg** (*Icahn School of Medicine at Mount Sinai*), **Michael Castellini** (*Retired; University of Alaska Fairbanks*), **Andreas Fahlman** (*Fundacion Oceanografic & Kolmarden Wildlife Park*), **Randall Davis** (*Texas A&M Galveston*), **Matthew Savoca** (*Stanford University*) **Dara Orbach** (*Texas A&M Corpus Christi*), **Jessica Jacob** (*Hawaii Pacific University*), **Amanda Ardente** (*Ardente Veterinary Nutrition*), **Gretchen Lovewell** (*Mote Marine Laboratory*), **Ashley Barratclough** (*National Marine Mammal Foundation & University of Florida*), **Robin Baird** (*Cascadia Research*), **Jenipher Cate** (*United States Fish and Wildlife Conservation Commission*), **Thomas Jefferson** (*National Oceanic and Atmospheric Administration*), **Chris Harvey-Clark** (*Dalhousie University*), and more!

**Prerequisites:** At least 2 courses beyond basic Biology I & II (BSC2010 & 2011) in the following scientific fields: Physiology (example – PCB4723C), Anatomy (example – ZOO3713C), Ecology (example – PCB4043C), Zoology (examples – ZOO2203C, ZOO4926), Aquatic Sciences (examples – GLY3083C, FAS4932, ZOO4403C, VME4012), or **instructor permission**.

## Course Description

**Course Overview:** This is an intensive graduate-level online course designed to provide an introduction to a variety of marine mammal species including cetaceans, sirenians, pinnipeds, mustelids, and ursids. Each module will broadly explore a particular ecological, biological, or physiological topic related to the study of marine mammals, including biodiversity & life history, diving physiology, thermoregulation, foraging ecology, and reproduction as well as the many

conservation and management issues faced by different marine mammal species. Each module will consist of multiple lectures, assigned readings, and an assignment and/or quiz.

**Student Learning Outcomes:** By the end of the course, each student will successfully be able to:

- **Identify** and **classify** the major taxonomic groups of marine mammals
- **Examine** the morphological and physiological adaptations evolved by marine mammals and **explain** their role in a marine mammals' ability to inhabit an aquatic environment.
- **Examine** the biological and ecological relationships between marine mammals and the aquatic environments they inhabit.
- **Identify** the major conservation issues faced by different marine mammal species and **evaluate** species specific susceptibility to particular threats.

**Course Material:** There are no required textbooks for this course. All quiz questions will come from the information provided in the lectures and assigned readings. However, supplemental information may be necessary to enhance learning of the required material. Below are some *recommendations* for supplemental resources:

1. Encyclopedia of Marine Mammals – Wursig, Thewissen, and Kovacs
2. Marine Mammals: Evolutionary Biology – Berta, Sumich, and Kovacs

**\*Both of these recommended textbooks are available to read online through the UF libraries system for FREE! Details are provided on the course E-Learning website for how to access this resource.**

**Course Format:** This course is offered entirely in an asynchronous online format and relies primarily on recorded lectures, videos, and assigned readings (either from book chapters or primary scientific literature). Students are expected to work independently through each module as they review each of the recorded lectures and assigned readings and complete assignments. Opportunities for class discussions and group assignments may be available throughout the course. To Access the course, please go to: <http://elearning.ufl.edu/> starting **May 13<sup>th</sup> at 8am EST**, hit the e-Learning in Canvas button and log in with your Gator link username and password.

**1. Lectures and Assigned Readings:** Each module will contain multiple recorded lectures related to the respective module topic. Online lectures are provided by experts in the field and are meant to provide an introduction to and overview of the topic at hand. Assigned readings will include primary scientific literature and/or book chapters and are meant to supplement lecture material in order to maximize learning outcomes for each module. All readings are available through **Course Reserves**, which can be accessed by clicking the 'Course Reserves' tab on the left hand side of the E-Learning page. PDFs of each assigned reading will also be made available on Canvas.

**2. Assignments:** Module assignments are assigned sporadically throughout the semester and will be due by **Sunday at 11:59pm EST**. Assignments may vary between modules and are meant to help students learn to critically think through and apply the topics discussed in the respective

module. If necessary, a detailed rubric will be provided for each module assignment. When applicable, assignments must be in a MS Office document format (*use .doc or .docx for documents; .ppt or .pptx for powerpoint, etc.*). All students should have access to Microsoft Office software for free during the semester, which can be accessed at: <https://it.ufl.edu/services/gatorcloud-microsoft-office-online>. If you have any issues with this, you can contact the campus computer support group (e-mail [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu), or call (352) 392-4357). Student's will be able to submit assignments an unlimited number of times **BEFORE** the assignment due date. Therefore, if any mistakes happen or you make changes to your assignments, you may upload a new version. The latest submission of each assignment will be graded.

**3. Quizzes:** Quizzes are assigned once every three weeks and will be due by **Sunday at 11:59pm EST**. Each quiz will cover the topics presented within the lectures and assigned reading materials for the related modules. Quizzes are open-book and students will have 120 minutes to complete each quiz. Each quiz will have only one attempt. Please note that the open-book nature of the quizzes is to provide you the ability to reference details or refresh your memory regarding the topic, not for you to re-watch lectures and/or re-read required readings to answer the questions. Most, if not all, quiz questions will be in a short answer/essay format.

**Late Submissions:** Requirements for assignments in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>. Students are encouraged to reach out to Dr. Cowart as soon as possible if they have any issue submitting an assignment on time so that a viable solution can be determined. In general, submission of assignments past the scheduled due date/time will automatically receive a 10% reduction per day from the final grade. No late quiz submissions will be accepted without prior approval from Dr. Cowart. For quizzes, submission must be completed at least 10-15 minutes prior to the final due date/time for the system to recognize and process your submission. Failure to do so will result in the system giving you a zero (*so please don't wait until the last minute to take your quizzes!*).

All work should be conducted **independently** unless specified in the assignment directions. Any writing should be your own thoughts or a summary of other reading material. Plagiarism will result in a 0 for the assignment and, depending upon the severity of the issue, may result in a 0 for the class.

**Library Support:** Hannah Norton has agreed to provide assistance with accessing the UF library system and conducting literature searches. She can be reached at [nortonh@ufl.edu](mailto:nortonh@ufl.edu) and she has access to the Canvas/E-Learning class web page.

**MediaSite Lectures:** If you are having trouble accessing the lectures through the MediaSite Link, when prompted, you need your Gator Link User Name and Password and you may need to download Silverlight if it does not automatically prompt you to do so. You may install Silverlight through the following link: <http://www.microsoft.com/getsilverlight/Get-Started/Install/Default.aspx>.

For the most current information on the computer requirements, please visit this page before the course begins: <https://it.ufl.edu/> and <https://it.ufl.edu/policies/student-computing-requirements/>

**Grades:** Grades are based on successful completion/submission of required Q&A questions, quizzes, and the final project (semester-long).

- Module Assignments constitute **60%** of the final grade,
- Quizzes constitute **40%** of the final grade,

### Grading Scale

<b>A</b> 94-100	<b>A-</b> 90-93	<b>B+</b> 87-89	<b>B</b> 83-86	<b>B-</b> 80-82
<b>C+</b> 77-79	<b>C</b> 73-76	<b>C-</b> 70-72	<b>D+</b> 67-69	<b>D</b> 63-66
<b>D-</b> 60-62	<b>F</b> 0-59			

### Course Schedule

Week	Topic	Lectures	Assignments
1  (May 13-19)	Taxonomy, Biodiversity, & Life History Traits	Course Introduction ( <i>Cowart</i> ) Sirenians ( <i>Cowart</i> ) Cetaceans Parts 1-2 ( <i>Cowart</i> ) Pinnipeds ( <i>Cowart</i> )	Discussion Board Introduction
			Syllabus Quiz
2  (May 20-26)	Evolution	Marine Mammal Evolution Parts 1-3 ( <i>Uhen</i> )	Assignment 1 – Article Critique
3  (May 27-Jun 02)	Anatomy / Physiology	Anatomical Adaptations Parts 1-3 ( <i>Reidenberg</i> )	Quiz 1 ( <i>Modules 1-3</i> )
4  (Jun 03-09)	Thermoregulation	Thermoregulation Parts 1-4 ( <i>Castellini</i> )	Assignment 2 – Questionnaire
5  (Jun 10-16)	Diving Physiology	Diving Physiology Parts 1-3 ( <i>Fahlman</i> ) Diving Physiology ( <i>Davis</i> )	Assignment 3 – Perusal

6 (Jun 17-23)	<b>Sensory Biology &amp; Acoustics</b>	Marine Mammal Acoustic Anatomy Parts 1-4 ( <i>Reidenberg</i> )	<b>Quiz 2</b> (Modules 4-6)
7 (Jun 24-Jul 07) <small>*Please note that this module includes UF Summer Break Jun 24-30</small>	<b>Foraging Ecology</b>	Cetacean Foraging Ecology ( <i>Savoca</i> )	<b>Assignment 4</b> – Knowledge Blitz
8 (Jul 08-14)	<b>Reproduction</b>	Mating Systems/Tactics and Diversity of Marine Mammal Genitalia ( <i>Orbach</i> ) Reproduction in Marine Mammals ( <i>Cowart</i> )	<b>Assignment 5</b> – Scientific Poster
9 (Jul 15-21)	<b>Health &amp; Disease</b>	Cetacean Virology ( <i>Jacob</i> ) Nutritional Management of Marine Mammals Under Human Care ( <i>Ardente</i> ) Marine Mammal Pathology & Disease ( <i>Harvey-Clark</i> ) Marine Mammal Health and Disease ( <i>Barratclough</i> )	<b>Quiz 3</b> (Modules 7-9)
10 (Jul 22-28)	<b>Management &amp; Research</b>	Marine Mammal Management & Research ( <i>Barratclough</i> ) Science & Management of Hawaiian Odontocetes ( <i>Baird</i> ) FWS – What It Means to be a ‘Resource Management Agency’ ( <i>Cate</i> )	<b>Assignment 6</b> – Research Methods
11 (Jul 29-Aug 04)	<b>Stranding Investigations &amp; Necropsy</b>	Stranding investigations and necropsy ( <i>Lovewell</i> ) Manatee Necropsy ( <i>FWC Training Video</i> )	<b>No Assignments</b>
12 (Aug 05-11)	<b>Conservation Issues &amp; Course Wrap-Up</b>	Marine Mammal Conservation ( <i>Jefferson</i> ) Right Whale Conservation ( <i>Moore</i> )	<b>Student Evaluations</b>

## UF Counseling Services

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. These resources include:

### Health and Wellness

- *U Matter, We Care*: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.
- *Counseling and Wellness Center*: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- *Student Health Care Center*: Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).
- *University Police Department*: [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).
- *UF Health Shands Emergency Room / Trauma Center*: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

### Academic Resources

- *E-learning technical support*: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).
- *Career Connections Center*: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- *Library Support*: Various ways to receive assistance with respect to using the libraries or finding resources.
- *Teaching Center*: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- *Writing Studio*: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- *Student Complaints On-Campus*: [Visit the Student Honor Code and Student Conduct Code webpage for more information](#).
- *On-Line Students Complaints*: [View the Distance Learning Student Complaint Process](#).

## Mental Health Statement

Students facing difficulties with mental health are encouraged to communicate directly with the course instructor if said difficulties interfere with their successful performance in the course. This is an intensive course that requires significant time commitments; however, successful student learning is the underlying goal of the course. We understand that at any point students may be balancing multiple different commitments in their life whether that be other academic courses, jobs, family life, life changes/transitions, etc. It is our goal to ensure that these difficulties do not negatively impact your ability to learn and successfully complete the course. Please open a healthy line of communication with the course instructor so that we may work directly with you to ensure your success in the course.

## Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. [Click here to read the Conduct Code](#). If you have any questions or concerns, please consult with the instructor or TAs in this class.

## Accommodation for Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. [Click here to get started with the Disability Resource Center](#). It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

## Software Use

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

## Course Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. [Click here for guidance on how to give feedback in a professional and respectful manner](#). Students will be notified when the evaluation period opens, and can complete evaluations through: (1) the email they receive from GatorEvals, (2) in their Canvas course menu under GatorEvals, or (3) via [ufl.bluer.com/ufl/](http://ufl.bluer.com/ufl/). [Summaries of course evaluation results are available to students here](#).