

SYLLABUS

Biology 627 / EVSS 627

Marine Tetrapod Biology

Fall 2018

Lecture 202 Grice 4hrs credit total with co-requisite 627L (lab/field component)

Instructor: Andy Shedlock
Office: Hollings Marine Lab - Room H212-C
Hours: HML Fridays 11-1PM (or by appointment)
Phone: Office: 843-725-4874; Cell: 843-469-0393
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Dropbox: Shared folder "Tetrapods F18"

Meeting Times 1 pm - 4 pm Grice Lecture Room 202, Monday and Wednesday
THIS WILL NEED TO BE FLEXIBLE FOR FIELD TRIPS

Prerequisites Ecology (BIOL 341) or its equivalent and at least one additional advanced biology course such as Genetics or Vertebrate Zoology.

Texts

Spotila, Jim, 2004. Sea Turtles: a Complete Guide to their Biology, Behavior and Conservation. Johns Hopkins University Press ISBN 0-8018-8007-6; Required

Berta, Sumich and Kovacs, 2006. Marine Mammals: Evolutionary Biology 3rd Edition Academic Press, Second Edition ISBN 100120885522; Required

Fitzpatrick: Field Guide to the Birds of North America
National Geographic Society Edition ISBN 0792268776
Suggested volume but can use similar field guide such as Peterson's or Sibley's

Supplemental References On reserve in the Marine Resources Library (MRRRI Bldg)

Bolton, Alan, and Blair Witherington. 2003. Loggerhead Sea Turtles. Smithsonian Books, Washington 319 pp. ISBN 1-58834-136-4

Callaway, J. M. and E. L. Nicholls. 1997. Ancient Marine Reptiles. Academic Press. 501pp. ISBN 0-12-155210-1.

Carr, Archie. 1967. So Excellent a Fish. The Natural History Press. 258pp.

Heatwole, Harold. 1999. Sea Snakes (Second Edition). University of New South Wales Press and Krieger Publishing. 148pp. ISBN 1-57524-116-1.

Lutz, P., J. Musick. 1997. The Biology of Sea Turtles, Volume I, CRC Press. 432pp. ISBN 0-8493-8422-2.

Lutz, P., J. Musick, J. Wyneken. 2002. The Biology of Sea Turtles, Volume II, CRC Press. 496pp. ISBN 0-8493-1123-3.

Schreiber, E.A. and J. Burger. 2002. Biology of Marine Birds. CRC Press. 722 pp. ISBN 0-8493-

9882-7.

Wyneken, J., K. J. Lohman, J. Musick. 2013. The Biology of Sea Turtles, Volume III, CRC Press. 457pp. ISBN 978-1439873076.

Attendance Policy: Attendance is not monitored but attendance is expected and strongly encouraged. Please notify the Instructor immediately if you have a schedule conflict with a class meeting or a field trip schedule.

Grading: The course grade will be based on: (1) a written term paper; (2) two-part oral presentation on the term paper topic; (3) two lecture exams; (4) a field/lab notebook; and (5) active class participation. Each item (1-5) is worth 20% of the grade.

- A 90 above
- B+ 86-89
- B 80-85
- C+ 76-79
- C 70-75
- F below 70

Synopsis

Over the past 200 million years vertebrates have repeatedly evolved adaptations that take advantage of the extensive estuarine and marine habitats of our planet. This course emphasizes the comparative evolutionary perspective and historical processes that have led to both the diversity and the common themes of physiological, behavioral and anatomical adaptations which characterize amniote lineages of reptiles, birds and mammals that exploit a wide array of marine situations. The adaptations of turtles, crocodiles, snakes, the iguana, birds, pinnipeds, sirenians, polar bears, otters, and cetaceans will be addressed in lectures, discussions, labs and field work. Special attention will be given to the faunas of South Carolina. In this course we will review the research and natural history literature regarding marine tetrapods and place this literature in the context of current research priorities and needs for understanding the basic biology and conservation of these species. We will evaluate marine tetrapods as models for advanced studies in evolution, physiology, behavior and ecology. Each student will also review the literature in an area of higher marine vertebrate biology and develop a term paper and seminar on this topic. Lab and field work will be integrated each week with the lecture and will emphasize hands-on techniques, conservation and behavioral physiology.

Since several Charleston area faculty work on marine tetrapod questions, we will take advantage of their expertise as guest lecturers and lab/field trip hosts during the semester. ***We must maintain a flexible laboratory schedule and flexible attitude*** since we need to take advantage of the many opportunities as they happen. For example, if a marine mammal strands, we need to be able to adjust our schedules to assist with the necropsy under the direction of adjunct faculty member Wayne McFee at the NOS laboratory. Thus this laboratory may occur at any time during the semester, depending on availability of specimens. Likewise, weather may preclude going into the field on a Tuesday but we might be able to adjust for this by switching to a Monday.

Learning Objectives

1. To develop a solid working knowledge of the biological diversity of the marine reptiles, birds and mammals.
2. To thoroughly understand the evolutionary significance of secondary marine adaptations.
3. To evaluate the evolutionary relationships of the extinct and living marine tetrapods.
4. To learn the basics of marine tetrapod physiology, ecology, behavior, anatomy and field identification.
5. To learn the primary laboratory and field techniques for the study of marine tetrapods.
6. To appreciate the wide diversity of conservation issues related to marine tetrapods.

Schedule & Syllabus

Standard 2.5 hour lecture format will be: 1-hour lecture, short briefing about weekly field trip/lab logistics, 15-minute break, video presentations or primary literature and group discussion, especially regarding conservation issues.

Text Abbreviations: MME (Berta et al., Marine Mammal Evolution); MB (Schreiber and Burger, Marine Birds); ST (Spotilla, Sea Turtles); SS (Heatwole, Sea Snakes)

WEEK 1 AUG 22

Introduction to the class, discussion of syllabus, review of field trip schedule for the entire semester; South Island/Yawkey Field Trip Logistics

Video: Incredible Journey

Reference: MME Ch. 2

WEEK 2 AUG 27-29

What do we mean by “Marine” + “Tetrapods”?

Video: Morphed

Reference: MB Ch. 6

Field/Lab: DNR Sea Turtle Nest Inventory, Yawkey Wildlife Refuge

WEEK 3 SEPT 3-5

Stem tetrapod diversity and adaptations

Discuss synoptic reference handouts of vertebrate evolution and systems

Reference: ST Ch. 1-4

Video: Kiawah turtle research in the 1970's

Field/Lab: SC Aquarium, Sea Turtle Rescue Center

WEEK 4 SEPT 10-12

Guest Lecture, Prof Dave Owens: 35 Years of Sea Turtle Research

Reference: ST Ch. 5, 10, plus Conclusion (13)

Video: vintage excerpts from the Owens archive

Field/Lab: DNR Sea Turtle Necropsy, HML

WEEK 5 SEPT 17-19

Field/Lab: Bennett's Point/Donnelly ACE Basin
ACE conservation management and coastal habitat surveys
Field/Lab: Turtle Survival Alliance Conservation Center, Cross, SC

WEEK 6 SEPT 24-26

Tetrapod diversity and the paraphyly of convergent marine forms
Reference (a): MME Ch. 1, 3 and 5, over successive weeks (sirenians before FL)

WEEK 7 OCT 1-3

Oral Presentations: Summary and Intro of Term Papers

MIDTERM EXAM (1 hour) + Break

WEEK 8 OCT 8-10

Introduction to birds
Reference: MB Ch. 1, 3, 18, 19 over successive weeks
Video: Life of Birds
Field/Lab: The Center for Birds of Prey, Awendaw, SC

WEEK 9 OCT 15-17

Guest Lecture, Dr. Melissa Chaplin, Endangered Species Biologist, USF&W
Avian conservation and shorebird ecology
Field/Lab: M. Chaplin USF&W tour of Bull Island Wildlife Sanctuary

WEEK 10 OCT 22-24

Mace Brown: Cetacean origins and the Mace Brown Museum of Natural History
Dr. Bobby Boessenecker: Pinniped origins, diversity, and life history
Reference: MME Ch. 4, 10, 11, 12 over successive weeks

WEEK 11 OCT 29-31

Marine tetrapod genetics and genomics
Video: Blue Planet Coastal Seas
Reading: MME Ch. 14.3.3 p.544-556, Ch 15
Field/Lab: Kiawah, Captain Sam's Inlet strand feeding area

Week 12 NOV 5-7 FALL BREAK

OPTIONAL FLORIDA ROAD TRIP

DEPART SATURDAY 3rd 6 a.m. – RETURN WEDNESDAY 7th ~9 p.m.

Archie Carr NWR / Melbourne Beach UCF Field Station, 1 night
Mote Marine Lab Research Center and Aquarium
Myakka River State Park camping 2 nights
Homosassa Springs Wildlife Park and wild manatees, 1 night

WEEK 13 NOV 12-14

Wayne McFee, NOAA-CCEHBR: Atlantic odontocete population research and marine mammal stranding network operations in South Carolina
Field/Lab: Dolphin behavior and bird spotting, Rat Island

WEEK 14 NOV 19-TG BREAK

Special topics in marine mammal biology and conservation
Video: Kingdom of the Blue Whale
Reference: MME Ch. 14.3.3 p.544-556, Ch 15

Week 15 NOV 26-28

ORAL PRESENTATIONS OF TERM PAPERS

Review of Exam 2 materials

EXAM 2 (PART 2 MATERIALS ONLY)

Week 16 DEC 3

Summary and prospectus for future research
Class “Open Discussion” FB Pier

Term Paper Due

Field/Lab Notes Due

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

1. **Center for Student Learning:** I encourage you to utilize the Center for Student Learning’s (CSL) academic support services for assistance in study strategies, speaking & writing strategies, and course content. They offer tutoring, Supplemental Instruction, study strategy appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and the services are available to you at no additional cost. For more information regarding these services please visit the CSL website at <http://csl.cofc.edu> or call (843)953-5635.
2. **Center for Disability Services** (<http://disabilityservices.cofc.edu/faculty/faqs.php>)

The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed

ACADEMIC INTEGRITY STATEMENT

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student's actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' exams, fabricating data, and giving unauthorized assistance. Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor. Students can find the complete Honor Code and all related processes in the Student Handbook at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>