

BIOL. 512: EVOLUTION AND ECOLOGY OF MARINE MAMMALS FALL, 2007

This course will examine various aspects of the evolutionary biology of marine mammals. Lecture topics include pinniped, cetacean and sirenian evolution, diet and foraging strategies, echolocation, energetics, diving physiology, reproductive strategies, population biology, and conservation. There will be several labs concentrating on the identification of local marine mammals.

Course Objectives: This course provides an introduction to marine mammal biology. Students will also learn:

- evolutionary and ecological concepts
- principles of organismal biology
- identification of California marine mammals

Course Format: In addition to lectures on Tuesday and Thursday (9:00-9:50 am), labs/field trips/discussion sections will follow the Thursday lecture (10:00-12:40 am). There will be an assignment at San Diego Museum of Natural History in Balboa Park as part of a lab on marine mammal functional morphology that you will do on your own. Attendance is required on a field trip to Sea World and Hubbs Sea World Research Institute tentatively scheduled for November 15 at 10:00 am. I will be attending the Marine Mammal Conference Nov 22- Dec 4. Lectures for this week will be available on-line and can be downloaded and viewed on Blackboard.

Grading: Grades will be based on two midterms (100 points each), a final (150 points), workshop presentation and 2-3 pg. outline (50 points), laboratory/field trip assignments (50 points), and field observation assignment (50 points). The final exam is comprehensive and will include 50 points from the first two sections of the course. The format of the exams will be matching, multiple choice, true/false, short answer and essay.

TEXT: *Marine Mammals: Evolutionary Biology*, 2nd ed., 2006 by Annalisa Berta, James L. Sumich and Kit M. Kovacs, Elsevier/Academic Press, San Diego, CA.

LAB MANUAL: *Laboratory Manual for Evolution and Ecology of Marine Mammals* (Biol. 512) by Peter J. Adam and Annalisa Berta. Available at Aztec Shops.

INSTRUCTOR: Annalisa Berta, South Life Sciences 250, 260 (lab) 594-5392.
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OFFICE HOURS: Tu 10:00 am-11:00 am and by appt.

BIOL 512: EVOLUTION AND ECOLOGY OF MARINE MAMMALS
Lecture Schedule-Fall, 2007

Tu 8/28 Introduction, Marine mammal groups (**Reading:** Chapter 1)
Th 8/30 Systematics and Classification (**Reading:** Chapter 2)
Th 8/30 LAB: Systematics and Classification

Tu 9/4 Pinniped Evolution and Systematics (**Reading:** Chapter 3)
Th 9/6 Pinniped Evolution and Systematics
Th 9/6 LAB: Pinniped morphology and identification of local pinnipeds

Tu 9/11 Cetacean Evolution and Systematics (**Reading:** Chapter 4)
Th 9/13 Cetacean Evolution and Systematics (**Reading:** Chapter 4)
Th 9/13 LAB: Cetacean morphology and identification of local cetaceans

Tu 9/18 Sirenians and Other Marine Mammals (e.g. Sea Otters and Polar Bears):
Evolution and Systematics (**Reading:** Chapter 5)
Th 9/20 Biogeography (**Reading:** Chapter 6)
Th 9/20 LAB: Sirenian morphology and Polar Bear Video

Tu 9/25 Integumentary and Sensory Systems (**Reading:** Chapter 7)
Th 9/27 Functional Morphology and Locomotion (**Reading:** Chapter 8)
Th 9/27 LAB: Functional Morphology of Marine Mammals

Tu 10/02 MIDTERM 1
Th 10/04 Energetics (**Reading:** Chapter 9)
Th 10/04 LAB: WORKSHOP PRESENTATION: Collapse of No Pacific Ecosystems:
Effects of Whaling and Killer whales
WORKSHOP PRESENTATION: Collapse of No Pacific Ecosystems: Is it real? and
Other Causes

Tu 10/09 Diving Physiology (**Reading:** Chapter 10)
Th 10/11 Diving Physiology
Th 10/11 LAB: WORKSHOP PRESENTATION: Turf Wars and La Jolla Seals
WORKSHOP PRESENTATION: Marine Mammal Sanctuaries- Do they work?

Tu 10/16 NO CLASS
Th 10/18 Ted Cranford Guest lecture: Sound Production for Communication and
Echolocation (**Reading:** Chapter 11) note: Lecture will begin at 10:00AM
Th 10/18 LAB: Videotapes

Tu 10/23 Sound Production for Communication and Echolocation (**Reading:** Chapter 11)
Th 10/25 Diet and Foraging Strategies (**Reading:** Chapter 12)
LAB: WORKSHOP PRESENTATION: Modeling and Past and future of whales and
whaling WORKSHOP PRESENTATION: Identifying What to Conserve?
Field Observation Hypothesis due

Tu 10/30 Diet and Foraging Strategies (**Reading:** Chapter 12)

Th 11/01 MIDTERM 2

Th 11/01 NO LAB

Tu 11/06 Reproductive Structures, Strategies and Patterns (**Reading:** Chapter 13)

Reproductive Structures, Strategies and Patterns (**Reading:** Chapter 13)

Th 11/08 Reproductive Structures, Strategies and Patterns (**Reading:** Chapter 13)

Th 11/08 LAB: WORKSHOP PRESENTATION: Ecotourism: Swim with Dolphin and feeding programs WORKSHOP PRESENTATION: Ecotourism: Whale watching

Tu 11/13 Population Structure and Dynamics (**Reading:** Chapter 14)

Th 11/15 SEA WORLD FIELD TRIP

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Tu 11/20 Population Structure and Dynamics (**Reading:** Chapter 14)

Th 11/22 THANKSGIVING BREAK

Tu 11/27 NO CLASS – Lecture Available On-Line (Bb) Conservation (**Reading:** Chapter 15)

Th 11/29 NO CLASS– Lecture Available On-Line (Bb) Conservation (**Reading:** Chapter 15)

Tu 12/4 NO CLASS

Th 12/6 Review for Final, Field Observation Assignment DUE

FINAL EXAM (includes Final Lab Quiz) Thursday Dec 13 8:00-10:00am