

## BIOL. 512: EVOLUTION AND ECOLOGY OF MARINE MAMMALS FALL, 2009

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 12 at 10:00 am.

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*, 2<sup>nd</sup> 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.  
email: aberta@sunstroke.sdsu.edu

OFFICE HOURS: Tu 10:00 am-11:00 am and by appt.

BIOL 512: EVOLUTION AND ECOLOGY OF MARINE MAMMALS  
Lecture Schedule-Fall, 2009

Tu 9/1 NO CLASS

Th 9/3 Introduction, Marine mammal groups (**Reading:** Chapter 1)  
Systematics and Classification (**Reading:** Chapter 2)

Th 9/3 LAB: Systematics and Classification

Tu 9/8 Pinniped Evolution and Systematics (**Reading:** Chapter 3)

Th 9/10 Pinniped Evolution and Systematics

Th 9/10 LAB: Pinniped morphology and identification of local pinnipeds

Tu 9/15 Cetacean Evolution and Systematics (**Reading:** Chapter 4)

Th 9/17 Cetacean Evolution and Systematics (**Reading:** Chapter 4)

Th 9/17 LAB: Cetacean morphology and identification of local cetaceans

Tu 9/22 Guest lecture: Ted Cranford Sound Production for Communication and Echolocation (**Reading:** Chapter 11)

Th 9/24 Guest lecture: Ted Cranford Sound Production for Communication and Echolocation (**Reading:** Chapter 11)

Tu 9/29 Sirenians and Other Marine Mammals (e.g. Sea Otters and Polar Bears): Evolution and Systematics (**Reading:** Chapter 5)

Th 10/01 Biogeography (**Reading:** Chapter 6)

Th 10/01 LAB: Sirenian morphology and Polar Bear Video

**Tu 10/06 MIDTERM 1**

Th 10/08 Functional Morphology and Locomotion (**Reading:** Chapter 8)

Th 10/08 LAB: Functional Morphology of Marine Mammals

Tu 10/13 NO CLASS

Th 10/15 NO CLASS

Th 10/15 SD NATURAL HIST. MUSEUM LAB- ON YOUR OWN

Tu 10/20 Integumentary and Sensory Systems (**Reading:** Chapter 7), **Field Observation Hypothesis DUE**

Th 10/22 Energetics (**Reading:** Chapter 9), Diving Physiology (**Reading:** Chapter 10)

Th 10/22 LAB: WORKSHOP PRESENTATIONS: Identifying What to Conserve

WORKSHOP PRESENTATION: Anthropogenic Noise and Marine Mammals

Tu 10/27 Diving Physiology

Th 10/29 Diet and Foraging Strategies (**Reading:** Chapter 12)

Th 10/29 LAB: WORKSHOP PRESENTATIONS: Decline of the Steller Lion: Causes?

WORKSHOP PRESENTATION: Pinnipeds and Fisheries Interactions

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

**Th 11/01 MIDTERM 2**

Th 11/01 NO LAB

Tu 11/03 Reproductive Structures, Strategies and Patterns (**Reading:** Chapter 13)

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

Th 11/05 Reproductive Structures, Strategies and Patterns (**Reading:** Chapter 13)

Th 11/05 LAB: WORKSHOP PRESENTATION: Ecotourism: Swim with Dolphin and feeding programs  
WORKSHOP PRESENTATION: Ecotourism: Whale watching

Tu 11/10 Population Structure and Dynamics (**Reading:** Chapter 14)

Th 11/12 SEA WORLD FIELD TRIP

Th 11/12 SEA WORLD FIELD TRIP

Tu 11/17 Population Structure and Dynamics (**Reading:** Chapter 14)

Th 11/19 Conservation (**Reading:** Chapter 15)

Th 11/19 LAB: WORKSHOP PRESENTATION: Relocation: Des It Work?  
WORKSHOP PRESENTATION: Long Term Environmental Change and Marine Mammals

Tu 11/24 Conservation (**Reading:** Chapter 15)

Th 11/26 THANKSGIVING BREAK-NO CLASS

Tu 12/1 RESEARCH PRESENTATION

Th 12/3 LAB: WORKSHOP PRESENTATION: Collapse of the North Pacific Ecosystems: Effects of Whaling and Prey Switching?  
WORKSHOP PRESENTATION: Modelling the Past and Future of Whales and Whaling

Tu 12/8 Review for Final, **Field Observation Assignment DUE**

Th12/10 LAB: WORKSHOP PRESENTATION: Turf Wars and La Jolla Seals  
WORKSHOP PRESENTATION: Marine Protected Areas: Do They Protect Marine Mammals?

**Th 12/17 FINAL EXAM (includes Final Lab Quiz) 8:00-10:00 am**