

## SEMESTER AT SEA COURSE SYLLABUS

**Fall 2012**

**Discipline: Biology**

**BIOL 1559-101: Marine Biology (Section 1)**

**BIOL 1559-502: Marine Biology (Section 2)**

**Division: Lower**

**Faculty Name: Allan Schoenherr**

### **Pre-requisites:**

**COURSE DESCRIPTION:** This is a general course in the biology of marine ecosystems. The course will introduce students to the principles of marine life and processes with an emphasis on evolution and ecology of these systems. It will cover basic concepts of oceanography, and a discussion of marine communities including estuaries, intertidal, subtidal, pelagic, deep sea, black smokers, mangrove swamps, and coral reefs. It also will feature a discussion and classification of marine organisms and their habitats. The impact of human activities on the marine ecosystem will also be discussed.

### **COURSE OBJECTIVES**

**Upon completion of this course a student will be able to:**

- 1. Identify and characterize the world's great oceans.**
- 2. Describe and characterize the different marine habitats including the rocky intertidal, estuaries, deep ocean, epipelagic zone, and special habitats such as black smokers and coral reefs.**
- 3. Understand the basic flow of energy in the marine ecosystem from photosynthetic organisms to herbivores to carnivores.**
- 4. Describe the impact of human activity on the marine ecosystem including factors such as overfishing, development, pollution, and mining.**
- 5. Describe the diversity of marine organisms and recognize examples of the major groups of animals and plants that inhabit the sea.**
- 6. Describe the adaptations of marine organisms to various ecological zones of the sea.**

### **REQUIRED TEXTBOOKS**

**AUTHOR:** Morrissey, J.F and J.L. Sumich.

**TITLE:** AN INTRODUCTION TO THE BIOLOGY OF MARINE ORGANISMS

**PUBLISHER:** Jones and Bartlett Publ., Sudbury, MA

**ISBN #:** 10: 0763781606 Paperback

**DATE/EDITION:** 9<sup>th</sup>.

**COST:** \$100.00

Additional readings will be available on reserve in the library or will be available electronically on the ship's intranet.

## TOPICAL OUTLINE OF COURSE

- Day 1 – The physical environment, geography and characterization of the world’s oceans
- Day 2 - Ocean currents, tides, and shoreline processes, Chapter 1
- Day 3 - Climate and weather
- Day 4 - Ecology of marine ecosystems, Chapter 2
- Day 5 - Marine food webs and food chains, trophic ecology
- Day 6 - Can we depend on the sea to feed us?
- Day 7 - Introduction to marine biotic zones, Chapter 11
- Day 8 – Rocky intertidal zone and its subdivisions, Chapter 9
- Day 9 – Stresses and adaptations of intertidal life
- Day 10 –Estuaries and their importance to the marine ecosystem, Chapter 8
- Day 11 – Midterm Exam
- Day 12 – Coral reefs, an enigma of productivity, Chapter 10
- Day 13 – Mangroves and their role in the marine ecosystem
- Day 14 – Marine plants and phytoplankton, the importance of dissolved organic matter, Chapter 3, 4
- Day 15 – Bacterial communities of the deep ocean, Black smokers, Chapter 5, 12
- Day 16 – The bathyal zone
- Day 17 – Marine invertebrates, Chapter 5
- Day 18 – Marine vertebrates, fishes and reptiles, Chapter 6
- Day 19 – Marine vertebrates, birds and mammals, Chapter 7
- Day 20 – Wastewater treatment and conservation
- Day 21 – Marine pollution
- Day 22 – Exploitation of marine resources, Chapter 13
- Day 23 – Review for final exam

### **FIELD ASSIGNMENTS** (*At least 20 percent of the contact hours for each course.*)

An eight-hour field lab experience is required, after which students will submit a writeup that is worth 20 percent of the final grade. Extra activities involving marine biology are encouraged. Writeups may be submitted for extra credit. Extra credit options include visits to marine aquaria and laboratories, fishery institutes, and aquaculture facilities that will be available for visitation at many ports. Field exercises also could include an analysis of diversity and abundance of organisms in the rocky intertidal zone for each port we visit. Opportunities for whale watching are available in several ports. On board activities will include observations of the nature and behavior of marine mammals and pelagic birds. Simulated marine ecosystem studies also will be included. Discussions with agency employees and local citizens is encouraged.

### **METHODS OF EVALUATION**

Midterm examination	75 points
Final examination	75 points
2 Field writeups	50 points
Extra Credit (5 points each):	20 points
Analysis of current events	
Analysis of materials from ports	
Independent observations on relevant materials	

## **RESERVE LIBRARY LIST**

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