

Prepared by the Department of Natural Sciences & Life Fitness

Date of Departmental Approval: 2/5/07

Date approved by Curriculum and Programs: October 3, 2007

Effective: Fall 2007

1. **Course Number:** ENV 125
Course Title: Coastal Ecology
2. **Description:** This course is an introduction to coastal marine habitats, their species, and their ecological relationships. Students develop an understanding of the diversity of living things along the Cape Cod shoreline. Students also examine the wide diversity of habitats and their differences on the Cape. This course includes extensive lab and field work.
3. **Student Learning Outcomes (instructional objectives, intellectual skills):**
Upon successful completion of this course, students are able to do the following:
 - Describe the ecological importance of phytoplankton and zooplankton.
 - Distinguish the morphological differences between diatoms, dinoflagellates, radiolarians, and foraminiferans.
 - Use a microscope to identify different species of plankton, and morphological differences in algae.
 - Identify and describe the three main groups of macroalgae.
 - Illustrate the different phyla associated with the intertidal zone, including the Porifera, Echinodermata, Bryozoa, Mollusca, and Annelida.
 - Name and describe several examples of mollusks on the Cape.
 - Describe the different zones – benthic, planktonic, nectonic, and intertidal.
 - Recognize the stages of ecological succession at a field site, particularly a salt marsh.
 - Distinguish between a food chain and a food web, and name the different components.
 - Write several field reports using data from the assigned field trips.
 - Trace a drop of water through the water vascular system of a sea star.
 - Assess the causes and impact of coastal erosion.
 - Explain the ecological importance of salt marshes.
 - Identify the salt marsh vegetation and its adaptations.
 - Study the impact of oil spills along the coast.
 - Design and implement an independent field project with a presentation to the class.
4. **Credits:** 3 credits
5. **Satisfies General Education Requirement:** No
6. **Prerequisite:** None
7. **Semester(s) Offered:** Fall, Spring, Summer
8. **Suggested General Guidelines for Evaluation:** Tests, Project, Lab and Field Reports
9. **General Topical Outline (Optional):** See attached.

ENV125 Coastal Ecology – Course Outline

I. Introduction to Coastal Ecology

- A. Food chains and Food webs
- B. Symbiosis
 - 1. Parasitism
 - 2. Mutualism
 - 3. Commensalism
- C. Zonation
 - 1. Benthic
 - 2. Nectonic
 - 3. Planktonic
- D. Intertidal area
 - 1. Plant and animal adaptations
 - 2. Wave action
 - 3. Substrate
 - 4. Temperature; oxygen concentration

II. Plankton – Structure and Ecology

- A. Phytoplankton
 - 1. Diatoms
 - 2. Dinoflagellates
- B. Zooplankton
 - 1. Radiolarians
 - 2. Foraminiferans

III. Seaweeds (Macroalgae)

- A. Classification
- B. Structure
- C. Life cycles
- D. Ecology and Distribution
- E. Eel grass (flowering plant)

IV. Animals – Classification, structure, and ecology

- A. Bryozoans
- B. Sponges
- C. Mollusks
- D. Echinoderms
- E. Crustaceans

V. Marine Habitats

- A. Sandy shore
- B. Dunes
- C. Salt marshes
- D. Estuaries
- E. Barrier Beach systems
- F. Field study and analysis

VI. Marine Environmental Issues

- A. Oil spills
- B. Marine debris
- C. Sewage, runoff
- D. Nitrogen loading
- E. Invasive species
- F. Offshore energy development
- G. Erosion