Degree Applicable

Glendale Community College
January 2010

COURSE OUTLINE

Biology 129
Directed Studies in Marine Ecology

I. Catalog Statement

Biology 129 is a course emphasizing individual investigation of the natural marine environment through field and laboratory studies. Students examine the interrelationship between marine organisms and their habitats by special projects dealing with a particular problem. Library research, a scientific paper, and an oral presentation of the directed studies are an integral part of the course. Field studies will investigate various localities during different semesters, such as Baja California, the Channel Islands, the Northern California Coast, and local marine habitats.

Units: 1-3 units
Field and Laboratory Study: 3-9 hours

Prerequisite: Biology 125 or Biology 101 and Biology 102

II. Course Entry Expectations

Skill Level Ranges: Reading - 5; Writing - 5; Listening/Speaking - 5; Math - 5

Prior to enrolling in the course, the student should be able to:
1. demonstrate an understanding of concepts in general biology using examples from the marine environment;
2. know some of the basic geological, chemical and physical characteristics of the marine environment in order to understand the adaptations of marine organisms for survival;
3. recognize major taxonomic groups of marine organisms as a way to understand biodiversity;
4. compare and contrast the major marine ecosystems;
5. identify some of the marine resources currently used by humans and some of the problems caused by human impact on the marine environment.

III. Course Exit Standards

Upon successful completion of the required course work, the student will be able to:
1. understand the major biological community dynamics of a particular study area through class visits to different communities with the instructor.
2. design a simple field experiment and carry out the experiment and relevant controls in the field.
3. do library research to discover other papers and books, which may be applied to the student's project report.
4. write a formal research paper on the results of the student's independent research project.
5. make an oral presentation to the class on the student's findings and conclusions from the project.

IV. Course Content

A. Introduction – The Scientific Method of Inquiry 3 hours
B. Types of Field Investigative Projects (Examples) 2 hours
   1. Morphological Studies – Adaptations to living in a particular habitat, comparisons between different localities.
   2. Behavioral Characteristics – Method of food gathering, avoidance of predators, maintenance of intertidal position.
   3. Physiological Studies – Ability to tolerate salinity and temperature variation, ability to absorb organic detritus, reaction to environmental stimuli.
   4. Distributional Studies – Correlation between environmental parameters and distribution within various habitats.
   5. Population Characteristics – Density, Biomass Distribution, sex ratio, age presence or absence.
C. Library Research 6 hours
   1. Scientific Journals
   2. Biological Abstracts
   3. Note taking
   4. Style and Format
D. Presentation of Field Study Design 1 hour
   1. Hypothesis and Objectives
   2. Date Collection Procedures
   3. Materials and Equipment
E. Field Studies including Direct Observation and Data Collection 30 hours
   1. Periodic Presentations of Field Study Progress
   2. Critical Analysis of Findings and Methods
F. Written Report of Field Study 4 hours
   1. Abstract
   2. Format
   3. Charts and Drawings
G. Oral Presentation of Field Project 2 hours

V. Methods of Presentation

Directed research and field studies.

VI. Assignments and Methods of Evaluation

No formal exam is given, as this is a research and project report class. Students will do library research on a topic of interest, form hypotheses, set up experimental design and do simple experimentation in the field. Their findings will either be written up as a formal research paper or presented orally to the other students.

VII. Textbook

This is a research and project report class so no textbook is mandatory for adoption. However, the current editions of the following tittles are recommended or have been used in the past (texts will vary depending on the specific geographical location being investigated):

Garrison, T., Oceanography: An Invitation to Marine Science, 7th edition
Brooks/Cole, 2009.
13th Grade textbook reading, ISBN 049539193X

Castro, P. and Huber, M.E. Marine Biology. 8th ed.
McGraw Hill, 2010.
13th Grade textbook reading, ISBN 007893673X.

Nybakken, J. and Bertness, M. D.. Marine Biology: An Ecological Approach. 6th ed.
Pearson/Benjamin Cummings, 2005.
13th Grade textbook reading, ISBN 0805345825.

Levinton, J. S. Marine Biology: Function, Biodiversity and Ecology. 3rd ed.
Oxford University Press, 2009.
13th Grade textbook reading, ISBN 0195326946.

VIII. Student Learning Outcomes

1. The student will be able to understand the major biological ecosystem dynamics of a particular study area through field experimentation, which may encompass one or more of the following data sets: morphology, behavior, distribution or population.