COURSE OUTLINE

BIOL-104

Oceanography

3 Credits

Science Core Course

HOWARD COMMUNITY COLLEGE

Description

This course is designed to introduce the student to the four major disciplines in ocean sciences: biological, chemical, geological and physical oceanography. These areas are studied by describing the composition of the oceans and then by examining the major processes which are active there, such as plate tectonics, ocean circulation, wave and tidal action and food webs. In addition, the course will cover man's use of the ocean as a natural resource and as a waste disposal site. (3 hours weekly)

Statement on General Education and Liberal Learning

A liberal education prepares students to lead ethical, productive, and creative lives and to understand how the pursuit of lifelong learning and critical thinking fosters good citizenship. General education courses form the core of a liberal education within the higher education curriculum and provide a coherent intellectual experience for all students by introducing the fundamental concepts and methods of inquiry in the areas of mathematics, the physical and natural sciences, the social sciences, the arts and the humanities, and composition. This course is part of the general education core experience at Howard Community College.

Overall Course Objectives

Upon completion of this course, the student will be able to:

1. Describe the origin of the solar system, the Earth, and the ocean basins.
2. Compare and contrast historical and current ocean-related measurement techniques.
3. Describe the unique properties of water and sea water in particular.
4. Demonstrate an understanding of the physical and chemical processes that affect the character of beaches and shorelines in general.
5. Appreciate the biological adaptations of organisms living in the intertidal region.
6. Discuss the concept of plate tectonics and how it unifies many marine geological observations.
7. Compare and contrast active and passive continental margins.
8. Visualize the topography of the sea floor.
9. Define the classification of island types.
10. Describe the Earth's radiation balance and how that drives atmospheric circulation.
11. Recognize the processes that drive oceanic circulation.
12. Discuss how waves are formed and why they break.
13. Identify the forces responsible for tides.
14. Classify and describe marine plankton.

15. Recognize the hierarchy of marine organisms.
16. Recognize and discuss the various adaptations of marine organisms.
17. Identify methods of symbiosis.
18. Demonstrate and understand the behavior of light and sound in the open ocean.
19. Compare and contrast the tropics and polar oceans.
20. Articulate the problems and issues associated with exploitation of biological and mineral resources from the sea.

Major Topics

I. The Water Planet
II. Cosmic Origins
III. Historical Perspectives
IV. The Waters of the Earth
V. The Ocean's Edge
VI. The Intertidal Zone
VII. Continent Margins
VIII. Beyond Land's End
IX. Plate Tectonics
X. Islands
XI. Marine Meteorology
XII. Ocean Circulation
XIII. Wind, Waves and Water Dynamics
XIV. The Ebb and Flow
XV. Plankton: Floaters and Drifters
XVI. Nekton: Swimmers
XVII. Reptiles and Birds
XVIII. Mammals: Seals and Otters
XIX. Mammals: Whales
XX. Living Together
XXI. Light in the Sea
XXII. Sound in the Sea
XXIII. Life Under Pressure
XXIV. The Polar Seas
XXV. The Tropic Seas
XXVI. Mineral Resources
XXVII. Biological Resources
XXVIII. Marine Pollution
XXIX. Hawaii
XXX. Epilogue
A. Future Directions
B. Synoptic View

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will be determined by performance on the mid-term and final exam.

Other Course Information

This course is a Science core course, Science elective and an Arts and Sciences elective.