

MAUI COMMUNITY COLLEGE

COURSE OUTLINE

1. ALPHA AND NUMBER: OCN 201
COURSE TITLE: Science of the Sea
CREDITS: Three (3)
DATE OF OUTLINE: September 30, 2003

2. COURSE DESCRIPTION: Introduces basic concepts of geological, physical, chemical, and biological oceanography. Emphasizes relationships between land-based and marine-based sciences.

3. CONTACT HOURS/TYPE: Three (3)/week; Lecture

4. PREREQUISITES: ENG 22 OR 55 with at least a C, or English placement at ENG 100, and Math placement at MATH 20 or higher.

COREQUISITES: N/A

RECOMMENDED PREPARATION: High School Science

APPROVED BY _____

DATE _____

**Received March 2004
Under Amnesty Program
SLOs Updated & Linked To Content
COWIQ Grid Prepared**

5. GENERAL COURSE OBJECTIVES:

To introduce students to the areas of geological, physical, chemical, and biological oceanography. To apply oceanography concepts to local and global environmental and marine-related issues. To introduce the ways in which many diverse areas of science integrate together, and to the methods scientists use to learn about and study the marine environment.

6. SPECIFIC COURSE OBJECTIVES, COMPETENCIES, AND STUDENT LEARNING OUTCOMES:

(For assessment purposes these are linked to #7, Recommended Course Content.)

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

- a. Differentiate between the multi-disciplinary areas of oceanography.
- b. Locate the major ocean basins on a world map and describe modern methods of exploring the ocean.
- c. Explain the modern theory of plate tectonics and describe geological phenomena in terms of plate tectonic theory.
- d. Describe the structure of the seafloor from the continental margins to the deep-ocean basins.
- e. Explain the importance of oceanic sediments for understanding long-term geological and climate phenomena on the Earth.
- f. Identify the major chemical constituents of seawater and define salinity as it is used in oceanography.
- g. Define density and describe the density structure (layering) of the ocean.
- h. Explain how heat, light, and sound are affected by the nature of water.
- i. Describe the Coriolis Effect and how it influences the movement of air and water masses in each hemisphere.
- j. Describe the major climate zones and atmospheric circulation patterns on the Earth.
- k. Explain how major weather and climate systems (such as hurricanes and El-Nino) are influenced by the ocean environment.
- l. Explain the difference between oceanic surface currents and deep-ocean circulation, and describe the processes that produce them.
- m. Describe the surface-current circulation patterns in each ocean basin.
- n. Explain how waves are generated in the open ocean and how they are transformed into surf along the world's coastlines.

- o. Explain how Tsunami are generated and the properties of Tsunami.
- p. Describe the processes by which coastlines are modified by geological and oceanic processes.
- q. Explain how the tidal patterns we observe are produced.
- r. Describe how organisms are classified by the ecological role they play in the oceanic environment.
- s. Explain the major factors that influence the distribution and abundance of marine organisms in the oceanic environment.
- t. Describe energy flow, food webs, and trophic levels in the oceanic ecosystem.
- u. Define primary productivity in the oceanic ecosystem, and describe the factors that influence productivity in the ocean.
- v. Describe the methods by which the major commercial fisheries harvest their catches, along with the environmental and ecological problems associated with each.
- w. Explain the significance of exponential global population growth, and describe the ecological effects of such growth on the world's environment.

7. **RECOMMENDED COURSE CONTENT AND APPROXIMATE TIME SPENT ON EACH TOPIC:**

(Linked to #6, Specific Course Objectives, Competencies, and Student Learning Outcomes.)

- 1 Week: Introduction to the course and Oceanography
Ocean basins, Earth geography, and Ocean Exploration (a, b)
- 2 Weeks: Earth Geology, Plate Tectonics, Island Evolution, and Coral Reefs (c, d, p)
- 1 Week: Structure of the Seafloor and Continental Margins (c, d, p)
- 1 Week: Marine Sediments and Ocean Resources (e)
- 1 Week: Coastal Processes (c, d, p)
- 1 Week: Weather, Climate, and Prevailing Wind Patterns (i, j, k)

1 Week:	Physical and Chemical Properties of Water; Salinity (f, g, h)
2 Weeks:	Global Sea-surface temperatures; El-Nino Southern Oscillation; Hurricanes; Satellite Oceanography (g, h, i, j, k)
1-2 Weeks:	Ocean Circulation: Surface Currents and Thermohaline Circulation; environmental relationships and consequences; Tides (g, i, j, l, m, q)
1 Week:	Open-Ocean Waves and Surf; Tsunami (n, o, p)
2 Weeks:	Biological Oceanography Principles: Classification and Evolutionary Adaptations in the Ocean (r, s)
1 Week:	Primary Productivity in the Ocean: Principles and Distribution (s, t, u)
1-2 Weeks:	Commercial Fisheries and Environmental Issues (u, v, w)

8. TEXT AND MATERIALS, REFERENCE MATERIALS, AUXILIARY MATERIALS, AND CONTENT:

An appropriate text(s) and materials will be chosen at the time the course is to be offered from those currently available in the field. Examples include:

Texts: Garrison, Essentials of Oceanography, 2nd Edition
Brooks-Cole

Thurman, Introductory Oceanography, 8th Edition
Prentice Hall

Materials:

Text(s) may be supplemented with:

Accompanying Instructor Ancillaries if available
Articles and/or handouts prepared by the instructor
Magazine, journal, and/or newspaper articles

Other:

Appropriate films, videos and internet sites
Television programs
Guest Speakers
Other instructional aids

9. **RECOMMENDED COURSE REQUIREMENTS AND EVALUATION:**
Specific course requirements are at the discretion of the instructor at the time the course is being offered. Suggested requirements might include, but are not limited to:

Written or oral examinations
In-class exercises and questions
Homework assignments
On-line tutorials and practice quizzes
Projects or research (written reports and/or oral class presentations or posters)
Class participation

Evaluation and grading options will normally include:

Examinations (written and/or oral)	40-60%
In-class exercises	10-30%
Homework	5-10%
Projects/research	5-10%
Attendance and/or class participation	0-5%

10. **METHODS OF INSTRUCTION:**
Instructional methods vary considerable with instructors, and specific instructional methods will be at the discretion of the instructor teaching the course. Suggested techniques might include, but are not limited to:

Lecture
Problem solving
Class exercises, questions, or readings
Class discussions or guest lectures
Audio, visual or graphics presentations (software or internet)
Student class presentations
Group or individual projects
Field trips when possible
Other contemporary learning techniques (e.g., Service Learning, Co-op, internships, self-paced, etc.)

