MRSC A100: OCEANOGRAPHY

Item	Value
Curriculum Committee Approval Date	02/10/2021
Top Code	040100 - Biology, General
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)
Associate Arts Local General Education (GE)	• OC Physical/Biological Sci - AA (OB)
Associate Science Local General Education (GE)	• OCC Physical/Biological Sci-AS (OSB)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5B Biological Sciences (5B)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5B Biological Sciences (5B)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B2 Life Science (B2)

Course Description

An orientation to the marine sciences, including considerations of physical and chemical properties of the sea, the sea-air interface, the biology of the sea, the geology of the ocean basins, the sea as a physical, chemical, biological, and recreational resource and the obligation of mankind to control further contamination of the environment. Enrollment Limitation: MRSC A100H; students who complete MRSC A100 may not enroll in or receive credit for MRSC A100H. ADVISORY: ENGL A098 or ESL A099. Transfer Credit: CSU; UC.

Course Level Student Learning Outcome(s)

1. Differentiate the major seafloor features and their origin and evolution in the context of the theory of plate tectonics.
2. Compare the diversity of life forms found in the ocean and the characteristics of prominent marine communities.
3. Determine the major anthropogenic threats that the oceans face and how humans can positively respond to the specific current issues related to marine resource use.
4. Evaluate the physical and chemical properties of water molecules and how they affect the way that the ocean is structured.
5. Assess how solar energy, Earth's rotation, density differences, and gravity influence ocean and atmospheric characteristics and movement.

Course Objectives

- 1. Discuss the oceanic environment accurately
- 2. Formulate logical decisions related to conservation issues.
- 3. Identify present ocean resource management techniques
- 4. Evaluate ecological consequences of mismanagement of ocean resources
- 5. Identify the general features of organisms from the 7 major phyla of the ocean.
- 6. Discuss new discoveries in oceanography
- 7. Describe several pieces of equipment used in oceanographic research.
- 8. Describe the importance of the ocean, land, and atmosphere interface.
- 9. Demonstrate – in writing or via oral presentations – Ocean Literacy.
- 10. Student will explain how they affect the ocean and how the ocean affects them.

Lecture Content

Knowing the ocean world the world ocean concept the scientific method history of marine science Origins the formation of the universe, the solar system, and Earth Earth Structure and Plate Tectonics Earths interior layers the study of Earthquakes the Theory of Plate Tectonics Continental Margins and Ocean Basins ocean floor mapping passive vs active continental margins topology of deep ocean basins Sediments sediment types based on appearance, particle size, and source Neritic vs pelagic sediments Water and Ocean Structure the water molecule waters universal characteristics freezing point, boiling point, and density of seawater Seawater Chemistry pH, salinity, dissolved oxygen, and nutrients in seawater gases in seawater components and depth Circulation of the Atmosphere how the ocean and the atmosphere interact the atmosphere and uneven solar heating rotation and the coriolis effect prevailing wind systems and hurricanes Circulation of the Oceans mass flow of ocean water and surface currents driven by wind vertical water movement El Nino and La Nina thermohaline circulation and the Atlantic conveyor belt Waves waves and their classification behavior of waves deep-water waves, rogue waves, and internal waves Tides tides form by gravity and inertia the dynamic and equilibrium theory of tides tidal power Coasts erosional processes dominate some coasts depositional coasts char acteristics of U.S. Coasts Life in the Ocean the concept of evolution and how it explains the nature of life in the ocean classification and taxonomy of marine life the unity and diversity of life Plankton, Algae, and Plants plankton drifters nutrients of the ocean seaweeds and other large marine plants Marine Animals I – the invertebrates zooplankton through sponges, jellies, worms, clams, crabs, and sea stars Marine Animals II – the vertebrates fish, sharks, and rays; marine reptiles, birds, and marine mammals Marine Communities all marine organisms live in communities, producers, consumers, and decomposers types of marine communities Marine Resources the laws of supply and demand physical resources – sand, gravel, oil, and heavy metals renewable vs non-renewable resources the tragedy of the “commons” Environmental Concerns marine pollutants, minamata bay disaster marine conservation human activity and global warming of the ocean Marine Communities Marine Resources Environmental Concerns

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Reading Assignments

Students must complete 3 hours of reading each week from the assigned textbook.

Writing Assignments

One “before” for-credit written essay t evaluate students existing level of ocean literacy at the beginning of the semester and a second “after” essay (collected near the end of the semester) to evaluate students ability to write knowledgeably about the ocean and demonstrate Ocean Literacy.

Out-of-class Assignments

Current event write ups, chapter study guides, online quizzes, supplementary reading material, answer questions from supplementary reading. Homework hours per semester:Reading textbook and supplementary material - 80; Outside Assignments: Chapter quizzes - 18; Writing - Discussions that require library research - 10

Demonstration of Critical Thinking

Multiple choice, true and false, and matching exams – comprehensive final exam. Quizzes. Two for-credit written to evaluate students ability to write knowledgeably about the ocean and demonstrate Ocean Literacy.

Required Writing, Problem Solving, Skills Demonstration

One “before” for-credit written essay t evaluate students existing level of ocean literacy at the beginning of the semester and a second “after” essay (collected near the end of the semester) to evaluate students ability to write knowledgeably about the ocean and demonstrate Ocean Literacy.

Eligible Disciplines

Biological sciences: Masters degree in any biological science OR bachelors degree in any biological science AND masters degree in biochemistry, biophysics, or marine science OR the equivalent. Masters degree required. Earth science: Masters degree in geology, geophysics, earth sciences, meteorology, oceanography, or paleontology OR bachelors degree in geology AND masters degree in geography, physics, or geochemistry OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Garrison, T., Ellis, R. Oceanography: An Invitation to Marine Science, 10th ed. Cengage Learning, 2021