ESCI 130: PHYSICAL OCEANOGRAPHY

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Winter 2021
Credits:	3
Total Contact Hours:	54
Lecture Hours :	54
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	108
Strongly Recommended:	ENGL 101.
District General Education:	B2. Natural Sciences - Physical Sciences
Transferable to CSU:	Yes
Transferable to UC:	Yes - Approved
Grading Method:	Standard Letter

Catalog Course Description

A study of marine geology and bathymetry, physical processes within the marine environment, such as waves and currents, tides, sea-floor spreading, marine provinces, marine sediments, and environmental relationships. 54 lecture hours.

Course Objectives

- Describe the special nature of the earth as a " water planet," and recognize its place in the universe.
- Compare some of the current theories concerning the origin of the planet and the waters that cover its surface.
- Identify the features of the ocean's basins and relate the structures observed to theories of origin.
- Describe basic chemical oceanography in terms of water, and dissolved salts and dissolved gases.
- Describe the motions of the seas - as currents, waves, and tides - in terms of causes, influences and effects upon the land.
- Recognize the relationship that marine life has with its environment.

Major Course Content

1. Introduction
   a. History of Oceanography
   b. Formation of the Earth, its oceans, and its internal structure
2. Plate Tectonics and the Ocean Floor
   a. History and theory of plate tectonics and its relationship to physical oceanography
   b. Evidence that supports the theory of plate tectonics
3. Marine Provinces
   a. The depth and shape of the sea floor, active and passive margins, mid-ocean ridges, submarine canyons, and deep ocean basins.
4. Marine Sediments
   a. The origin, types, distribution, and economic significance of marine sediments
5. Water and Seawater
   a. Water's unique properties, salinity and its variations, halocline, thermocline, and pycnocline
   b. Chemical layers of the ocean
6. Air-Sea Interaction
   a. The seasons, Coriolis Effect, atmospheric circulation, and the Greenhouse Effect
   b. Weather and hurricanes
7. Ocean Circulation
   a. Surface currents, upwelling, down-welling, thermohaline circulation, and El Niño
   b. Unique circulation of each ocean basin
8. Waves and Water Dynamics
   a. Wave causes, motion, and terminology
   b. Wave refraction, wave reflection and seismic sea waves
9. Tides
   a. Causes of tides and tidal patterns
10. Beaches and Shoreline Processes
    a. Beaches, longshore currents, erosional and depositional coasts, and eustatic changes
    b. Beach hardening and coastal protection structures
11. The Coastal Seas
    a. Marine laws, estuaries, wetlands, and pollution
12. Marine Life and the Marine Environment
    a. The classification of marine organisms, adaptations, plankton, nekton, and benthic organisms

Suggested Reading Other Than Required Textbook

Internet sites and supplemental material in the form of handouts from the instructor.

Examples of Required Writing Assignments

Answer essay question on exam pertaining to the theory of plate tectonics and the evidence collected to support this idea.

Examples of Outside Assignments

Answer chapter review questions and online self-test questions Read required materials pertaining to oceanography Observe activities related to course content Example: Utilize carbon calculator website to roughly estimate their own annual carbon footprint, by inputting data about their everyday lives. Example: Recognize how and where important processes such as upwelling and downwelling occur.

Instruction Type(s)

Lecture, Online Education Lecture

IGETC Area 5: Physical and Biological Sciences

5A. Physical Science