Department: Science
Course Name: Oceanography

Course Description:
This course provides a comprehensive examination of the physical, chemical, geological, and biological processes that govern marine systems and regulate Earth's climate and biosphere. Students will analyze the physicochemical properties of seawater, ocean circulation, wave dynamics, tides, and plate tectonics, emphasizing the mechanisms that drive large-scale oceanographic patterns and their global implications.

Biological components of the course include marine primary productivity, trophic dynamics, nutrient cycling, population ecology, and community structure. Students will investigate the evolutionary adaptations, physiology, and ecological roles of major marine taxa, including algae and seagrasses, invertebrates, fishes, marine mammals, and reptiles.

The course further examines the structure and function of diverse marine habitats, such as coral reef ecosystems, intertidal rocky and sandy shorelines, pelagic systems, and deep-sea environments. Anthropogenic influences—including climate change, ocean acidification, hurricanes, and resource exploitation—are evaluated through the lens of Earth system science, highlighting the interconnectedness of ocean processes and their significance for global environmental stability. Prerequisite: Biology.

Content:
Ocean Water
Currents
Climate Change
Hurricanes
Tides
Tectonics
Food Webs
Communities
Nutrients
Marine Plants
Invertebrates
Fish
Mammals
Reptiles
Open Ocean & Deep Sea
Coral Reefs
Rocky Coasts
Sandy Coasts

Skills:
Collect data using some basic field methods and some methods specific to marine biology
Analyze data using statistical tests, by hand or in Excel
Graph or chart data
Utilize a variety of lab techniques
Identify variables, create methods, analyze and draw conclusions from experiments they design
Evaluate research for congruity, accuracy, validity, and applications
Organize information to create flow charts or other graphic representations
Create presentations using a variety of technological applications

Text and Materials:
No text for this class

Methods of Instruction:
Field studies and field data collection techniques
Project based learning
Class discussion with emphasis on integrating and analyzing data
Laboratory experiments
Lecture with focus on developing critical thinking skills
Demonstrations illustrating methods of experimentation
Computer simulations

Methods of Evaluation:
Laboratory Reports
Projects
Current Events
Quizzes
Tests