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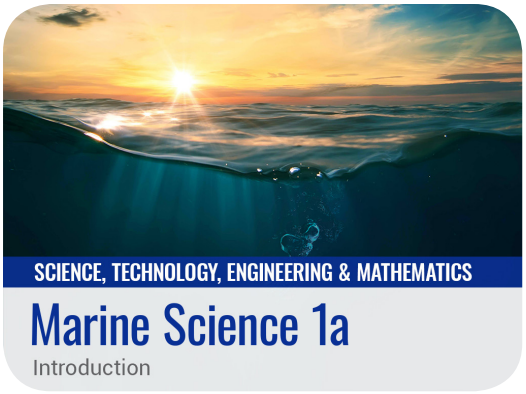
CAREER & ELECTIVE COURSES

SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS

Marine Science 1a

Introduction

Course Syllabus



Course Code: EDL126

Marine Science 1a: Introduction

Course Description

What is marine science and what role does it play in our daily life? In Marine Science 1a: Introduction, you'll explore the development of oceans and the role water plays in shaping our environment and climate. Learn about the oceanic and freshwater processes, changes in ecosystems, and the connection between water and weather. You will also learn about energy in the ocean, including the principles of fluid dynamics, the role of hydrostatic pressure, the law of conservation of energy, and the measurable properties of waves. Through the use of scientific inquiry, research, measurement, and problem solving, you will conduct various scientific procedures that will lead to an increased level of knowledge about Marine Science.

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Unit 1: About the Earth

Unit Summary

You may have heard that the earth's surface is about 70 percent water, which means there is over twice as much water as there is land covering the globe. In this unit, you will go beneath the surface to learn about how the earth and its oceans were created, how the structure of the earth impacts everything from the shape of the continents to tsunamis, and how the scientific method is applied to marine science.

Learning Objectives

- Define marine science
- Describe the development of oceans
- Explain different movements in plate tectonics and their results
- Discuss the scientific method
- Differentiate between a hypothesis and a theory

Unit 2: Water and the Environment

Unit Summary

Water is a unique and important resource on our planet. In this unit, you will discover the properties that make water so different from the other natural elements. Water's composition allows it to retain and release heat, playing a vital role in shaping the temperature of the air and land around it. You will explore how the world's oceans work with the wind and the atmosphere to define the climate on this planet we all share.

Learning Objectives

- Describe the distinct qualities of water
- Summarize the conditions that lead to climate change around lakes and oceans
- Discuss the role of water currents and wind in shaping climate
- Identify the sources of watersheds and the factors that influence them
- Differentiate between a science and pseudoscience

Unit 3: Tides

Unit Summary

Tides are an essential part of ocean life. You'll explore the causes of tides and why some tides rise higher than others. Tides also shape the land and water around them. In some cases, they erode sunny beaches, and in others, they form the brackish water of estuaries. Not only do tides define the organisms that inhabit the waters, but they also play a significant role in shaping the environment.

Learning Objectives

- Discuss oceanic and freshwater processes, such as tides and currents
- Describe changes in ecosystems resulting from environmental shifts
- Differentiate among freshwater, brackish, and saltwater ecosystems
- Identify the biotic and abiotic elements of an ecosystem
- Recognize the role of carbon and nutrient cycles in an aquatic environment

Midterm Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from the first three units in this course (Note: You will be able to open this exam only one time.)

Unit 4: Water and Weather

Unit Summary

Every year, about 200 people are killed in floods in the United States. Floods are just one of the many ways in which key elements of the atmosphere, such as temperature and water, create severe weather patterns. This unit will explore the ways water, particularly ocean water, interacts with the atmosphere to create certain weather patterns and habitats for ocean life.

Learning Objectives

- Identify the levels of the earth's atmosphere
- Explain the causes of severe weather
- Describe the behavior of gases in the ocean
- Discuss the significance of the water- and carbon cycles
- Cite evidence of climate change in the ocean

Unit 5: Energy in the Ocean

Unit Summary

Energy moves around the ocean in waves, and waves are subject to the laws of fluid dynamics. This set of laws defines how energy moves in and out of the water. Many factors determine the impact of energy on fluids, including the nature of the fluid or gas and the basic principles of physics, such as the law of conservation of energy. Waves are also shaped by their interactions with the environment and each other. So even when the seas look calm, there is a lot of action going on in the ocean.

Learning Objectives

- Discuss the basic principles of fluid dynamics
- Understand the role of hydrostatic pressure
- Explain the law of conservation of energy
- Identify the measurable properties of waves
- Recognize the impact of wave interactions

Final Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from units four and five in this course – the last two units. (Note: You will be able to open this exam only one time.)