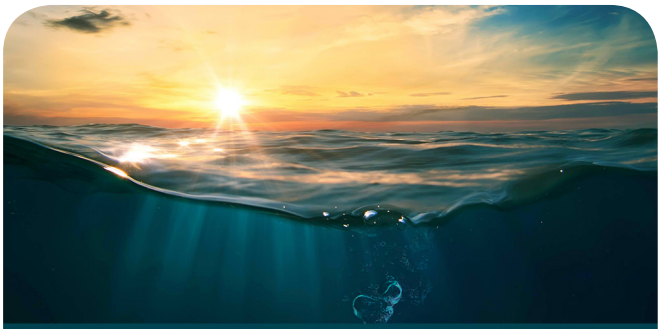
eDynamicLearning

CAREER & ELECTIVE COURSES



SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS

Marine Science 1b

Secrets of the Blue

Course Syllabus

Course Code: EDL127

Marine Science 1b: Secrets of the Blue

Course Description

Have you ever wondered about the secrets of the deep, and how the creatures below the ocean's surface live and thrive? In Marine Science 1b: Secrets of the Blue, you will further explore the aquatic cycles, structures, and processes that generate and sustain life in the sea. Learn about the importance of adaptation for survival and the role of natural selection in evolution. What populations survive and thrive in the ocean? You'll also learn how humans interact with the environment, the role we play on marine systems and ecosystems, and recognize the scientific and ethical questions that arise during advanced experiments. You will also learn about the exciting career opportunities that exist in the world of Marine Science.

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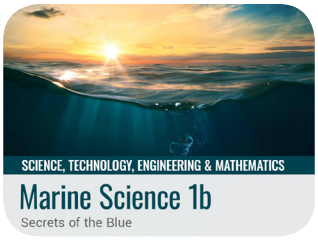


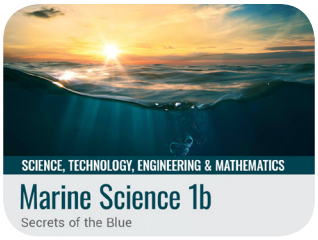
Unit 1: The Ocean and Its Populations

Unit Summary

The sun, winds, tides, and all the other elements of the ocean do more than just move water around. They also shape the environment to keep a wide variety of organisms alive. The ocean contains different layers, and each layer hosts organisms that have adapted to survive in the specific conditions of that region. Creatures in the deepest layers of the oceans are adapted to live in those depths. The populations there are just a small percentage of the ocean's residents. Identifying and documenting the species that live in the world's oceans is one of marine science's most daunting tasks.

Learning Objectives

- Identify the layers of the ocean and their characteristics
- Discuss the importance of adaptation for survival
- Analyze the role of natural selection in evolution
- Describe the characteristics of a population
- Articulate the methods used to identify and monitor marine populations



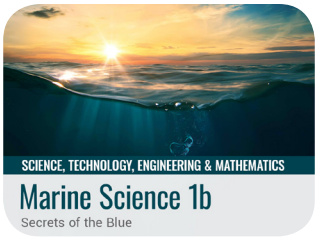
Unit 2: Populations That Thrive

Unit Summary

Populations work together within ecosystems. An increase or decrease in one population will directly impact the neighboring organisms. If there is a decline in the seal population, it is likely to cause a decline in the killer whale population because these whales feed on the seals. This is just one way in which every species has a specific function which keeps the ecosystem in balance. These populations are also in competition with each other for the resources within the ecosystem. In many cases, populations have mutually beneficial relationships, and in others, they endanger each other. Populations also increase and decrease in natural cycles, some of which take years. These variations in population are in addition to the many natural factors that can limit or bolster population growth. All of these factors make it hard to say how many fish there are in the sea at any given moment.

Learning Objectives

- Identify the role of a species within a food pyramid
- Compare and contrast the relationship among organisms
- Describe the trophic levels
- Discuss the interactions and interdependence that occur in aquatic environments
- Evaluate the factors impacting aquatic population cycles



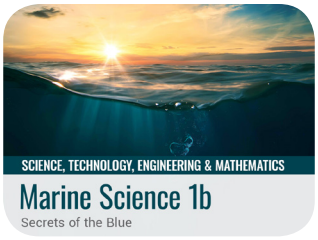
Unit 3: Human Interaction and the Environment

Unit Summary

There are many factors that impact the environment, and man is one of them. One of man's biggest threats to stable and healthy aquatic systems is pollution. From industrial accidents to algae overpopulation, many causes of water pollution come from the land. Once pollutants enter the environment, they can impact all levels of the ecosystem. Therefore, if we are working towards a clean environment, we can't just focus on the problems we see in the water; our focus must be broader. Fortunately, there are a lot of regulations designed to keep clean water as a top priority.

Learning Objectives

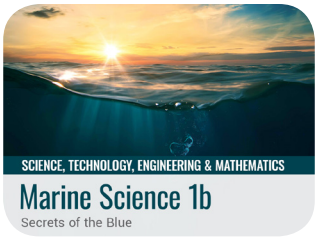
- Identify the large-scale environmental impact of human activity on marine systems
- Evaluate how the environment and personal health are related
- Investigate the role of humans in unbalanced ecosystems
- Analyze the role of human activities that influence marine environments
- Recognize the value of non-renewable resources



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.)



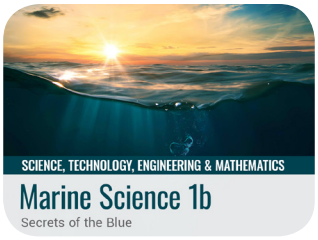
Unit 4: The Past and Future of Marine Science

Unit Summary

It is hard to say where marine science began, but the ocean has been the subject of study for thousands of years, as trade records for the Mediterranean Sea indicate. In the nineteenth century, the creatures that lived in the ocean became the subjects of scientific study, allowing marine science to emerge as its own discipline. Since then, marine scientists have explored the arctic regions and brought the ocean into our living rooms through documentaries and films. These efforts have raised international awareness of the issues threatening the ocean. These issues require global collaboration for ethical solutions if we want marine science and the ocean to have a positive future.

Learning Objectives

- Describe the history of marine science
- Identify the contributions of individuals to marine science
- Articulate the ethical expectations in marine science
- Recognize that scientific questions and conclusions may be influenced by social and cultural concerns
- Distinguish between scientific and ethical questions



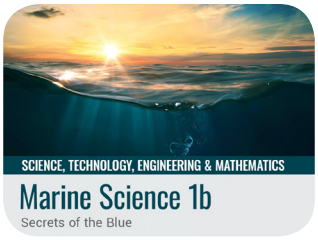
Unit 5: Careers in Marine Science

Unit Summary

Careers in marine science are found everywhere, from the ocean depths to the moon. One of marine science's most important jobs is to unlock the mysteries of the ocean and then pass this information along so that it can inform policies and practices here on the surface. Without understanding how the ocean works, we will never be able to save its valuable resources. Fortunately, great minds all over the globe are using the scientific method to study our waterways and helping all of us live well on Earth.

Learning Objectives

- Describe career options in marine science
- Identify the function of systems thinking in aquatic environments
- Discuss the role of technology in marine science
- Explain how science factors into human decision making
- Recognize that marine science requires a variety of approaches and contributions



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.)