



Marine Science A Syllabus

Course Description:

Marine Science is the study of the oceans on planet Earth. The course of study will begin with a brief look at the history of oceanography and the history of the formation of the earth itself. Students study the four major divisions of oceanography: geological oceanography, chemical oceanography, physical oceanography, and biological oceanography. Marine Science A covers the geological and chemical divisions of oceanography.

Geological oceanography is the study of the seafloor; what it is made of and how it "works". Students will study the concepts of plate tectonics, continental margins, ocean basins, sedimentation, and the structure of the seafloor. This study of geological oceanography will help us answer the question "Why are the oldest rocks that make up the seafloor only about 250 million years old when the oldest rocks found on the continents are over 4.5 billion years old?"

Chemical oceanography is the study of the composition of seawater. Students will learn about the properties of the water molecule, the structure and properties of seawater, how light is refracted by seawater, and dissolved gases in seawater. Our study of chemical oceanography will help us the question "What makes seawater salty when the rivers that supply water to the oceans are not salty?"

Learning Outcomes:

At the completion of Marine Science A, the student will be able to:

- Describe the origins of marine science.
- Know the major explorers who added to our knowledge of the oceans.
- Determine latitude and longitude and understand its importance to oceanographers.
- Describe the structure of the earth.
- Explain in supporting evidence for the structure of the earth.
- Analyze maps of the earth for evidence of plate boundaries.
- Understand the origins and development of the Theory of Plate Tectonics.
- Describe the movement of tectonic plates.
- Explain several means of determining the bathymetry of an ocean basin.
- Describe the components of an ocean basin and continental margin.
- Explain the origins of features found on the deep ocean floor.
- Explain the classification of sediments by sediment source.
- Identify patterns of sediments on the ocean floor.
- Draw and describe the composition of a water molecule.
- Describe the unique properties of the water molecule.
- Explain how those properties effect density stratification in seawater.
- Explain the dissolving ability of water.
- Explain the origins of the ocean's salinity.
- Know the major gases dissolved in seawater.
- Describe the Principle of Constant Proportions.
- Understand solar heating of the Earth's surface.
- Describe the Coriolis Effect.
- Explain how and why major storms and hurricanes form.

Required Text:

Publisher: Brooks Cole



Title: Oceanography: An Invitation to Marine Science

Author(s): Garrison

Year published: 2005

Student edition text: ISBN 0534408877

Prerequisites:

None

Course Methodology:

- This is an inquiry-based course. Students will generate knowledge through online readings, synchronous chats, and asynchronous discussions with students and their instructor, interactions with online tutorials, online and hands-on simulations, and virtual classroom chats.
- A semester project developed by each student will be used to demonstrate knowledge and understanding of the material in the course.
- The instructor will act as a guide, a facilitator, an events planner, and a resource advisor. He/she will always be available through e-mail.
- The student must actively construct and acquire knowledge by being intrinsically motivated to succeed. To succeed, students must participate and complete all readings and activities. This course requires the student's active participation.
- Both formal and informal assessment methods will be used in the course. Informal assessment will include an evaluation of the quality and timeliness of participation in class activities. Formal assessment may include multiple-choice quizzes, tests, discussion board participation, and written assignments. A final exam will be given at the end of the course.

Unit	Topics	Assignments
1	The History of Oceanography	<p>Text: Chapter 1 – Knowing the Ocean World</p> <p>Lecture: The History of Oceanography</p> <p>Activities:</p> <ul style="list-style-type: none"> • The HMS Challenger • Scripps Institution of Oceanography • History of Oceanography Chart <p>Discussion Topics:</p> <ul style="list-style-type: none"> • Learning Styles Assessment • The Earth is Round? Convince Me. • GPS? Pro or Con? <p>Review Project Options</p> <ul style="list-style-type: none"> • Option 1: Iceberg • Option 2: Undersea Volcano • Option 3: Hydrothermal Vents



Unit	Topics	Assignments
		Quiz
2	Earth Structure and Plate Tectonics	<p>Text: Chapter 3 – Earth Structure and Plate Tectonics</p> <p>Lecture: Earth Structure and Plate Tectonics</p> <p>Activities:</p> <ul style="list-style-type: none">• Plate Tectonics – What do you know?• Plate Tectonics – Prove It! <p>Discussion Topics:</p> <ul style="list-style-type: none">• Marine Science CareerQuest• Plate Tectonics: On the Move <p>Begin Project</p> <p>Quiz</p>
3	Continental Margins and Ocean Basins	<p>Text: Chapter 4 – Continental Margins and Ocean Basins</p> <p>Lecture: Continental Margins and Ocean Basins</p> <p>Activities:</p> <ul style="list-style-type: none">• Continental Margins and Ocean Basins – What do you know?• Monterey Bay Aquarium Research Institute <p>Discussion Topics:</p> <ul style="list-style-type: none">• Time Travel to Help Wegener• Research Submersibles <p>Continue Project</p> <p>Quiz</p>
4	Sediments	<p>Text: Chapter 5 – Sediments</p> <p>Lecture: Sediments</p>



Unit	Topics	Assignments
		<p>Activities:</p> <ul style="list-style-type: none">• Asteroids Headed for Earth?• Sediments – What do you know? <p>Discussion Topics:</p> <ul style="list-style-type: none">• Oil from the Ocean?• The History of the Ocean <p>Continue Project</p> <p>Quiz</p>
5	Water and Ocean Structure	<p>Text: Chapter 6 – Water and Ocean Structure</p> <p>Lecture: Water and Ocean Structure</p> <p>Activities:</p> <ul style="list-style-type: none">• Extreme Temperatures and Precipitation• Water and Ocean Structure – What do you know? <p>Discussion Topics:</p> <ul style="list-style-type: none">• Why Study Antarctica?• Global Warming <p>Continue Project</p> <p>Quiz</p>
6	Seawater Chemistry	<p>Text: Chapter 7 – Seawater Chemistry</p> <p>Lecture: Seawater Chemistry</p> <p>Activities:</p> <ul style="list-style-type: none">• Water – The Universal Solvent• Seawater Chemistry – What do you know? <p>Discussion Topics:</p> <ul style="list-style-type: none">• Imagine if... pH of Seawater vs. Pure Water



Unit	Topics	Assignments
		<ul style="list-style-type: none">• Deep Trouble: Overfishing the Ocean Continue Project Quiz
7	Circulation of the Atmosphere	Text: Chapter 8 – Circulation of the Atmosphere Lecture: Circulation of the Atmosphere Activities: <ul style="list-style-type: none">• Tracking Hurricanes• Circulation of the Atmosphere – What do you know? Discussion Topics: <ul style="list-style-type: none">• Hurricanes? No Problem!• Global Air Circulation: Where do you fit in? Finalize Project Quiz
8	Review Finish Project Final Exam	Text: Review Chapters 1 and 2 – 8 Lecture: None Activities: <ul style="list-style-type: none">• Oceanography – What have you learned? Discussion Topics: <ul style="list-style-type: none">• Share your Project• What Now? Submit Project Final Exam

Assessment:



Type of Assessment	Points
Assignments (16)	10 points each
Discussion Forums (16)	5 points each
Quizzes (7)	25 points each
Exploration Project	80 points
Final Exam (Unit 8)	40 points
Synchronous Discussions	Instructor Determined
Total Points Possible: 615	

Grading Scale:

Letter Grade	Percentage Earned
A	95%+
A-	90% - 94.9%
B+	87% - 89.9%
B	84% - 86.9%
B-	80% - 83.9%
C+	77% - 79.9%
C	74% - 76.9%
C-	70% - 73.9%
D+	67% - 69.9%
D	64% - 66.9%
D -	60% - 63.9%
F	59% and lower

Student’s Role and Responsibilities in this Course

Expectations:

Students are expected to conduct themselves in a responsible manner that reflects sound ethics, honor, and good citizenship. It is the student’s responsibility to maintain academic honesty and integrity and to manifest their commitment to the goals of NUVHS through their conduct and behavior. Students are expected to abide by all NUVHS policies and regulations. Any form of academic dishonesty, or inappropriate conduct by students or applicants may result in penalties ranging from warning to dismissal, as deemed appropriate by NUVHS.

Communication:

Throughout this course students will need to be in close contact with their instructor and fellow students. Students are expected to communicate via email and electronic discussion boards. Therefore, students should plan on checking email at least three times a week and participate in the discussion boards during the weeks they are live.

Instructors strongly encourage and welcome open communication. Clear, consistent, and proactive communication will ensure a successful experience in this course. It is the student’s responsibility to notify



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the instructor immediately if and when a personal situation occurs that affects his/her performance in this class. Being proactive with communication will result in a quick solution to any problems that may occur.

Technical Support is offered through Spectrum Pacific Learning Company (SPLC). Should a student need any technical assistance, he/she is to email the Help Desk as soon as possible at athelpdesk@myonlinelogin.com or call 1-877-252-7715. SPLC will help resolve technical problems and walk through the solution with students. If a problem persists for more than 48 hours, the student must also notify the teacher and NUVHS.

Time Required For This Course:

To complete this course in eight weeks, students should plan to allocate at least 12-15 hours a week on assigned readings, assignments, discussions (asynchronous and synchronous), quizzes, and exams. It is highly recommended that students organize themselves around the course schedule.

NUVHS wishes every student great success in their online class. Please contact us at 1.866.366.8847 if any questions arise.