Course Submission Form

Instructions: All courses submitted for the Common Core must be liberal arts courses. Courses submitted to the Course Review Committee may be submitted for only one area of the Common Core and must be 3 credits/3 contact hours. Colleges may submit courses to the Course Review Committee before or after they receive college approval. STEM waiver courses do not need to be approved by the Course Review Committee. This form should not be used for STEM waiver courses.

Course Data

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Subject</th>
<th>Catalog Nbr</th>
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<tbody>
<tr>
<td>027901</td>
<td>GEOL (GEOL - Geology)</td>
<td>18000</td>
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<table>
<thead>
<tr>
<th>Catalog Status</th>
<th>Contact Hours</th>
<th>No. of Credits</th>
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<tbody>
<tr>
<td>Approved</td>
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Course Title: Intro to Oceanography

Course Description: Properties of sea water, description of the state and biology of the oceans, ocean floor topography, basic ocean currents and general circulation, methods of exploration and research.

Department: Geography

Pre-Requisites/Co-Requisites: Prerequisite: Math Proficient and Reading Proficient/Non degree students

Course Syllabus [Attachment Filename(s)]

US-2026__Change_in_Course_CUNY_Core_SW_-_GEOL_18000_-_SYLL.docx

Location (Required or Flexible) and Learning Outcomes

<table>
<thead>
<tr>
<th>REQUIRED</th>
<th>FLEXIBLE</th>
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<tbody>
<tr>
<td>English Composition</td>
<td>World Cultures &amp; Global Issues</td>
</tr>
<tr>
<td>Math &amp; Quantitative Reasoning</td>
<td>US Experience in its Diversity</td>
</tr>
<tr>
<td>Life and Physical Sciences</td>
<td>Creative Expression</td>
</tr>
<tr>
<td>Learning Outcomes: Questions</td>
<td>Learning Outcomes: Responses</td>
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<tr>
<td>* 1. Gather, interpret, and assess information from a variety of sources and points of view.</td>
<td>The course will be structured along fundamental units in the study of the ocean, each of which will be explored using case studies in addition to traditional instruction. For each case study, students will gather data from several marine databases (NOAA, USGS, NASA), relevant journal articles and white papers. Through class discussions students will learn to interpret the collected data as they pertain to the specific process(es) or problem(s) presented and will be guided to assess the applicability and quality of the data being used.</td>
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<tr>
<td>* 2. Evaluate evidence and arguments critically or analytically.</td>
<td>For each case study, a series of analytical questions (4-6) will be formulated, designed to highlight different perspectives or points of view that may be derived from the data. Students then will be required to provide a substantial answer to each question evaluating these perspectives.</td>
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<tr>
<td>* 3. Produce well-reasoned written or oral arguments using evidence to support conclusions.</td>
<td>For each case study, students will be required to construct a `position paper' about any potential controversy surrounding the topic(s), and to show exactly (in the assigned chapters and journal articles, lectures, data) what supports their arguments.</td>
</tr>
<tr>
<td>4. Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the scientific world, including, but not limited to: computer science, history of science, life and physical sciences, linguistics, logic, mathematics, psychology, statistics, and technology-related studies.</td>
<td>The study and understanding of modern oceanography entails the use of fundamental concepts of physics, chemistry, geology, biology, mathematics and engineering technologies. Through traditional instruction and the use of case studies students will identify and apply these concepts and methods during the course of the semester. In particular, students will recognize and be able to explain modern methods of exploring the ocean, including: the use of soundings and sonar, the use of conductivity probes (CTDs), Acoustic Doppler Current Profilers, satellite observations, and ocean observing systems. Students will also identify the role of the scientific method in formulating plate tectonic theory, the fundamental physics governing ocean and atmospheric circulation and the chemical and biological controls on carbon within the ocean. Students will be required to answer targeted questions on the exams and apply these methods in their case study investigations.</td>
</tr>
<tr>
<td>5. Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions.</td>
<td></td>
</tr>
</tbody>
</table>
6. Articulate and evaluate the empirical evidence supporting a scientific or formal theory.

Students will learn through lecture discussions and case studies how to evaluate empirical evidence supporting basic oceanographic and related earth science theories. For example, theories to be analyzed include plate tectonics, accelerated sea level rise, ocean warming and acidification, and meridional overturning circulation. Through class participation and the construction of position papers, students will be guided on how to best articulate the supporting evidence to the theories being investigated.

7. Articulate and evaluate the impact of technologies and scientific discoveries on the contemporary world, such as issues of personal privacy, security, or ethical responsibilities.

8. Understand the scientific principles underlying matters of policy or public concern in which science plays role.

Students will learn through lecture discussions and case studies the scientific principles underlying matters of policy and public concern related to the discipline of oceanography. Such matters include (but are not limited to): the ocean’s role in global climate change, the impact of anthropogenic warming on the ocean, the impact of sea level rise on coastal resilience, the redistribution of heat, carbon, nutrients and plastics through ocean circulation, and the influence of fishing industries and coastal development interests on aspects of ocean stewardship.

A. If there is a change to the course title, what is the new course title?

B. If there is a change to the course description, what is the new course description?

C. If there is a change to the pre-requisites and/or co-requisites, what are the new pre-requisites and/or co-requisites?
INTRODUCTION TO OCEANOGRAPHY
GEOL 18000
TUESDAY/FRIDAY, 14:10-15:25
HUNTER WEST 714

CONTACT INFORMATION
Instructor: Dr. Frank Buonaiuto
Email address: fbuonaiu@hunter.cuny.edu (*)
Telephone: 212-650-3092
Office: Hunter North 1049, Department of Geography
Office Hours: Tuesday, 4:00 – 5:00 PM and by appointment.

*Note: The best way to contact me is through your Hunter College @myhunter email. You must (1) include the GEOL 18000 in your subject line (2) sign your full name as it appears in CUNYfirst, and (3) send all email from your @myhunter email address. I do not respond to personal email addresses. I try to answer all email within 24 hours.

COURSE DESCRIPTION
This course will offer an introduction to the subject of oceanography. We will discuss the physical, chemical, biological and geological aspects of the oceans; learn about the structure and motion of the atmosphere and how they influence ocean circulation; and we will learn about waves, tides and tsunamis. The ocean, comprising 71% of the Earth’s surface, is a crucial component of the Earth’s climate system and its dynamics determine the cycling of carbon and the production of oxygen throughout the planet. The oceans’ extreme environments host unusual forms of life, which are sensitive to anthropogenic influences. It is an important source of energy and economically valuable materials. Accordingly, the ocean has a profound influence on humans and civilization. In addition to providing a good introduction to aspects of the scientific world, it is a foundational course for Environmental Studies, Geography and BA/MA Earth Science Education majors.

The course has been divided into four units, each with a corresponding INTEGRATING CASE STUDY designed to achieve the expected LEARNING OUTCOMES listed below.

- Unit 1-Marine Geology
- Unit 2-Ocean Chemistry
- Unit 3-Ocean Dynamics
- Unit 4-The Ocean Environment
EXPECTED LEARNING OUTCOMES
1. Gather, interpret, and assess information from a variety of sources and points of view.
2. Evaluate evidence and arguments critically and analytically.
3. Produce well-reasoned written arguments using evidence to support conclusions.
4. Identify and apply the fundamental concepts of physics, chemistry, geology, biology, mathematics and engineering technologies to the study of modern oceanography:
5. Articulate and evaluate the empirical evidence supporting a scientific or formal theory:
6. Understand the scientific principles underlying matters of policy and public concern as they relate to the oceans:

CASE STUDIES
To support Expected Learning Outcomes:

- In addition to traditional instruction, each CASE STUDY will require students to gather data from several marine databases (NOAA, USGS, NASA), relevant journal articles and white papers. Through class discussions students will learn to interpret the collected data as they pertain to the specific process(es) or problem(s) presented and will be guided to assess the quality of the data being used.
- For each CASE STUDY a series of analytical questions (4-6) will be formulated, designed to highlight different perspectives or points of view that may be derived from the data. Students then will be required to provide a substantial answer to each question evaluating these perspectives.
- For each CASE STUDY students will be required to construct a ‘position paper’ about any potential controversy surrounding the topic(s), and to show exactly (in the assigned chapters and journal articles, lectures, data) what supports their arguments. Guidelines for the position paper will be distributed separately.
- Through traditional instruction, targeted exam questions and CASE STUDIES, students will identify and apply the concepts and methods of physics, chemistry, geology, biology, mathematics and engineering technologies during the course of the semester. In particular, students will recognize and be able to explain modern methods of exploring the ocean, the role of the scientific method in formulating plate tectonic theory, the fundamental physics governing ocean and atmospheric circulation and the chemical and biological controls on carbon within the ocean.
- Students will learn through lecture discussions and CASE STUDIES how to evaluate empirical evidence supporting basic oceanographic and related earth science theories. For example, theories to be analyzed include plate tectonics, accelerated sea level rise, ocean warming and acidification, and meridional overturning circulation. Through class participation and the construction of position papers students will be guided on how to best articulate the supporting evidence to the theories being investigated.
- Students will learn through lecture discussions and CASE STUDIES the scientific principles underlying matters of policy and public concern related to: the ocean’s role in global climate change, the impact of anthropogenic warming on the ocean, the impact of sea level rise on coastal resilience, the redistribution of heat, carbon, nutrients and plastics through ocean circulation, and the influence of fishing industries and coastal development interests on aspects of ocean stewardship.

INFORMED REGISTRATION STATEMENT
This is a 3-hr, 3.0-credit, science-based course, which meets the Scientific World requirement of the Hunter Common Core and the GER 2E General Education Requirement.

REQUIRED TEXT BOOKS
Earlier editions are acceptable and ebook ($83.49) options are available.

GRADING METHOD AND SCALE
Grades will be based on class participation, homework assignments, two mid-term exams and one final exam. A detailed description of the Hunter College Grading System may be found at
http://catalog.hunter.cuny.edu/content.php?catoid=23%naoid=3149. An itemized breakdown of the final grading rubric is provided below:

- Class participation: 10%
- Case Study Assignments: 30%
- Mid-term exam I: 20%
- Mid-term exam II: 20%
- Final exam: 20%

EXAM GUIDELINES AND POLICIES
Exams will be based on assigned textbook readings, journal articles, materials covered in class and case studies. Dates are CLEARLY posted on the Course Calendar and Content. Examinations are 1 hour and 15 minutes for the mid-term and 2 hours for the final exam. No electronic devices or reference materials will be permitted on the desk during exams unless specified. Make-up exams are ONLY available in extreme cases, and with medical (or other) forms that confirm the absence.

Exams are designed to evaluate a student’s ability to master content, integrate themes and concepts between sub-disciplines in oceanography, understand the usefulness and limitations of oceanographic data for studying processes, and apply logical arguments to support perspectives.

CR/NCR POLICY
The CR-NCR option will be honored only if the conditions stated on the CR/NCR form are satisfied: all course work has been completed and you earned grades such that you accumulate at least 50 points total in the course. Students on probation are ineligible.

ATTENDANCE AND CLASSROOM POLICIES
Attendance and class participation constitutes 10% of the final grade. Attendance is required at all lectures. All students are expected to abide by the following policies when in lecture in order to provide a more respectful and productive learning environment.

- All cell phones must be silenced.
- Laptops are permitted for note taking purposes only.
- Texting and other non-class related smart phone activities are forbidden. Students should quietly excuse themselves from the lecture if substantial external electronic communication is required.

HUNTER COLLEGE POLICY ON ACADEMIC INTEGRITY
Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

ADA POLICY
In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, please call: (212) 772-4857 or (212) 650-3230.
SYLLABUS CHANGE POLICY
Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. Updates will be posted regularly on BlackBoard.

INTEGRATING CASE STUDIES
Four case studies selected from the list below will be used to foster students’ understanding of the ocean. Each case study highlights various content and themes within the discipline, and is designed to promote the development of a citizen scientist, from describing fundamental concepts in oceanography, collecting, analyzing and synthesizing data to articulating the empirical evidence that supports theories and points of view. Students will be responsible for constructing a position paper for each selected case study.

- **Plate Tectonic Theory**: Possibly the most substantial contribution the discipline has made to society, this theory details the basic processes of the scientific method from the construction of the continental drift hypothesis to the elevated unified theory involving mantle convection and sea floor spreading.

- **Sand Waves**: The mining of sand waves on the continental shelf is crucial for the maintenance of the NY barrier island system. However, little is known about the processes shaping these features and timescales upon which they evolve. The DOD and the DOI have different perspectives on the roles these features currently play and should play in coastal resilience and management strategies.

- **Hurricane Sandy**: Students investigate the role of significant storm events in barrier coastline evolution. Analysis of the acute and long term impacts will be discussed. How did the storm influence the economy, habitat gain/loss, and bay water quality? How is it now shaping our thoughts and policies on climate change and coastal resilience?

- **Eutrophication, Gulf of Mexico Dead Zones to Lobster Die Offs in Long Island Sound**: Students deconstruct the processes that give rise to eutrophication on the local and regional scale, and how these conditions have been influenced by land use and management policies. Students will review the current research to determine what role eutrophication played in the decline in lobster populations in LIS.

- **Grey Seals To Great Whites**: Through this case study students explore population dynamics and fishery management. The rebound in the grey seal population following cullings in the 19th and 20th centuries has led to the return of the North Atlantic white sharks and a birth of ecotourism for Cape Cod, MA.

- **Garbage Islands, Plastic Land Up For Grabs**: Students explore ocean circulation and the world’s most pervasive surface drifter. Ownership and responsibility is called into question as Ocean Stewardship becomes an increasing global priority.

- **Arctic Sea Ice, The Polar Vortex and Rossby Waves**: Students investigate how accelerated sea ice loss in the Arctic has influenced the recent breakdown of the polar vortex, mechanisms for ocean-atmosphere coupling and global teleconnections.

- **Meridional Overturning Circulation**: Students research the debated primary and secondary processes influencing the rate and variability of MOC, the role observing systems play in deciphering the redistribution of heat and carbon.
## COURSE CALENDAR AND CONTENT

<table>
<thead>
<tr>
<th>Week</th>
<th>Unit</th>
<th>Topic: Chapter Title, Assignments</th>
<th>Reading</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Marine Geology</td>
<td>The Origin of the Ocean, A History of Marine Science</td>
<td>Chapter 1</td>
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<td>Chapter 2</td>
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<td>2</td>
<td>Earth Structure &amp; Plate Tectonics</td>
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<td>Chapter 3</td>
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<td>3</td>
<td>Continental Margins &amp; Ocean Basins</td>
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<td>Chapter 4</td>
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<td><strong>Case Study 1: Position Paper Due</strong></td>
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<td>Ocean Chemistry</td>
<td>Ocean Sediments</td>
<td>Chapter 5</td>
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<td>Water &amp; Ocean Structure, <strong>Midterm Exam 1 (Chapters 1-6)</strong></td>
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<td>6</td>
<td>Ocean Chemistry</td>
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<td>Chapter 7</td>
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<td><strong>Case Study 2: Position Paper Due</strong></td>
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<td>Ocean Dynamics</td>
<td>Circulation of the Atmosphere</td>
<td>Chapter 8</td>
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<td>8</td>
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<td>Circulation of the Ocean</td>
<td>Chapter 9</td>
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<td>9</td>
<td></td>
<td>Waves</td>
<td>Chapter 10</td>
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<td>Tides</td>
<td>Chapter 11</td>
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<td>Coasts, <strong>Case Study 3: Position Paper Due</strong></td>
<td>Chapter 12</td>
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<td>11</td>
<td>The Ocean Environment</td>
<td>Life in the Ocean, <strong>Midterm Exam II (Chapters 7-12)</strong></td>
<td>Chapter 13</td>
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<td>Primary Producers</td>
<td>Chapter 14</td>
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<td>13</td>
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<td>Marine Animals, Marine Communities</td>
<td>Chapter 15</td>
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<td>Marine Resources, <strong>Case Study 4: Position Paper Due</strong></td>
<td>Chapter 17</td>
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<td>15</td>
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<td>Final Exam, <strong>All Fair Game</strong></td>
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