INTRODUCTION TO OCEANOGRAPHY
GEOL 18000
TUESDAY/FRIDAY, 14:10-15:25
HUNTER WEST 714

CONTACT INFORMATION

Instructor: Dr. Haydee Salmun
Email address: hsalmun@hunter.cuny.edu (*)
Telephone: 212-772-5224
Office: Hunter North 1035, Department of Geography
Office Hours: Tuesday-Friday 1)) – 2:00 pm, ***and by appointment***.

***Note:** The best way to contact me is through your **Hunter College** @myhunter email – (1) You must 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 emails 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.

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

Oceanography: An Invitation to Marine Science (9th Edition), Garrison T., 2012
ISBN-13, 978-1305105164, CENGAGE Learning, retail $160-$200.
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%navoid=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 not allowed. 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 19^{th} and 20^{th} 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.

- **Antarctica, the Southern Ocean and Climate Change:** The Antarctic Peninsula is one of the fastest warming spots on the planet and the latest evidence seems to indicate that it is the warm ocean waters that are eating away the ice along the western part of the Peninsula. **S**tudents will research the primary and secondary processes influencing the rate and variability of melting, the role the atmosphere and the ocean systems play in deciphering the redistribution of heat and the specific conditions of this area that may be aiding the melting process.

- **The Oceans and their Giant Waves** - Learning from the mariners, the scientists and the surfers. Students will read different chapters of the book "The Wave" by S. Casey and will then research the most recent evidence of these giant waves as detected by modern measuring methods.

ADDITIONAL HELPFUL INFORMATION

My Teaching Philosophy: My goal in teaching is to help students in becoming confident and responsible professionals and to make this experience an enjoyable one. My approach to teaching involves being a facilitator in the learning process as opposed to being the authoritarian lecturer at the front of the room with a "one-way information transfer" style. I understand and respect individual differences in learning and do my best to promote learning in the classroom by working with individual differences rather than against them. At the same time, I wish to impart technical skills and a sense of responsibility by encouraging students to play the role of professionals in the classroom.

I expect students to put their best effort in this course. This involves participating in the in-class exercises, reading the assigned material, working out in-class assignments and Case Studies, editing when necessary until they are clear and correct, and preparing for quizzes and exams.

Lecture: I will spend part of the lecture time explaining the key concepts of oceanography and devote time to class discussion. You are expected to devote time outside the classroom to understand the concepts and review questions. I expect that lectures and discussion will help you be ready for exams.

Finally: It is important to start with a good study habit. Consistency is the key. Forming study groups is extremely helpful. Use my office hours and any other resource available to you throughout the semester. Make progress steadily as the material in this course cannot be understood the night before the exam. Concentrate on understanding rather than 'regurgitating'. Put out your best effort everyday.

The following are useful tips to do well in this or any class:

- Attend class and take detailed notes.
- Read the assigned material in the text (or other) ***before*** coming to class.

- Re-write your notes as soon as possible after class. This will allow you to fill in the details still fresh in your memory, and prepare questions for the next time the class meets.
- Test yourself by answering the questions in the book and in class.
- Carefully study the diagrams and charts in the book and in the lectures.

INTRODUCTION TO OCEANOGRAPHY
GEOL 18000
TUESDAY/FRIDAY, 14:10-15:25
HUNTER WEST 714

COURSE CALENDAR AND CONTENT

***** TENTATIVE SCHEDULE *****
27 January

Schedule of Topics & Readings			
Week	**Unit**	**Topic: Chapter Title, Assignments**	**Reading**
1	Marine Geology	The Origin of the Ocean A History of Marine Science	Chapter 1 Chapter 2
2		Earth Structure & Plate Tectonics	Chapter 3
3		Continental Margins & Ocean Basins **Case Study 1: Position Paper Due**	Chapter 4
4	Ocean Chemistry	Ocean Sediments	Chapter 5
5		Water & Ocean Structure **Midterm Exam I (Chapters 1-6)**	Chapter 6
6		Ocean Chemistry **Case Study 2: Position Paper Due**	Chapter 7
7	Ocean Dynamics	Circulation of the Atmosphere	Chapter 8
8		Circulation of the Ocean	Chapter 9
9		Waves Tides	Chapter 10 Chapter 11
10		Coasts **Case Study 3: Position Paper Due**	Chapter 12
11	The Ocean Environment	Life in the Ocean **Midterm Exam II (Chapters 7-12)**	Chapter 13
12		Marine resources	Chapter 17
13		Marine Pollution Eutrophication, Acidification	Chapter 18 Chapter 18
14		General Review and Discussion **Case Study 4: Position Paper Due**	
15		**Final Exam**	**All Fair Game**

A full detailed schedule will be available at the first day of class.