

Syllabus
EAS 4300: Introduction to Oceanography
Spring 2019
TuTh 3:00-4:15
ES&T L1175

Prof. Jean Lynch-Stieglitz
ES&T 1236
404-894-3944
jean@eas.gatech.edu
Office hours by appointment

Course web-site: Canvas

Help: Office hours are by appointment. If you would like to meet with the instructor, please send an email with 3 suggested meeting times. Students should submit any questions about the course content, assignments and logistics to the appropriate Discussion in Canvas. Please email the instructor only with questions that are specific to you (excused absences, requests for office hours, etc.), or if you wish to submit a question to the Canvas Discussion anonymously.

Course description: This course is an introduction to the ocean sciences, with particular focus on the role of the ocean in the geological, biological, chemical, physical, climatic, and human aspects of the Earth system. The class will cover the following topics: the origin of the ocean basins, marine sedimentation, properties of seawater, ocean circulation, aspects of marine ecology and biological productivity. We will also cover some interdisciplinary aspects of oceanography such as El Nino, Global Warming, The Carbon Cycle, Biogeochemical Cycles, Hydrothermal Vents and Oceanography from Space. Topics may vary from year to year.

Objectives: Learning goals include: (1) Gain a knowledge and understanding of how the ocean works as a system; (2) Learn to apply basic physical, chemical and ecological principles to Earth system problems; (2) Improve ability to reason qualitatively and quantitatively about Earth's natural systems;

Audience/Pre-requisites: There are NO previous course requirements. However, the students are expected to be familiar with basic scientific approaches, concepts and methods as well as the fundamental principles of biology, chemistry and physics on a high school level. Basic quantitative skills such as algebra and geometry are also required in homework and on exams. You are expected to be able to read, interpret and construct graphs and maps.

Required Textbook:

Introductory Oceanography by Thurman and Trujillo, 10th Edition

Additional required readings will be assigned for sections that are not well covered by the textbook. The textbook will provide a broad descriptive background of the topics covered, and not all content will be covered in lectures. It is essential, therefore, that you do the reading.

Reading Questions: Approximately 30% your exam questions will be taken or modified from the Questions and Exercises at the end of each chapter. These questions are assigned on Canvas and are to be completed before each exam. Full credit will be given for reading questions completed with thoughtful response before due date.

Lectures and In-class Activities: The lectures and activities will provide more in-depth coverage of topics introduced in the textbook, or coverage at a more rigorous level. Copies of the slides which illustrate the lecture will be provided on Canvas after each class. However, the students are responsible for taking notes on the lecture itself.

Problem Sets: There will be weekly problem sets during the semester. The homework will be assigned on Tuesday and due the following Tuesday. No late homework will be accepted without prior

arrangements. It's great to collaborate on homework with friends, but material turned in must be your own thoughts and in your own words. Please write the names of any collaborators on your homework.

Exams: There will be two mid-term exams and a final exam. Exams will emphasize a general understanding of the topic, rather than the ability to memorize details. Exams will cover material from lectures and required readings.

Grading: 20% Problem Sets, 10% Reading Questions, 10% Activities, 60% Exams (20% each).

Your final grade will be assigned as a letter grade according to the following scale:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

Attendance: See catalog for institute policies for excused absences and make-up work: <http://www.catalog.gatech.edu/rules/4/>. No student will receive a passing grade for the course if they miss six or more classes without an official excused absence.

Classroom Expectations: Class will start promptly at 3:00. Late arrival is disruptive to the lecture and to your fellow students. Cellphone (including texting) or internet use has been shown to be disruptive to the learning of those around you, and should only be in support of class assignments. Questions from students during lectures are encouraged. If you are confused, likely someone else is as well. All viewpoints, presented respectfully, are valued in class discussion.

Student-Faculty Expectations Agreement: Georgia Tech strives for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectations for both students and faculty.

Academic Integrity: Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit <http://www.catalog.gatech.edu/policies/honor-code/> or <http://www.catalog.gatech.edu/rules/18/>. Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Collaboration and Group Work: No books, notes, or collaboration are allowed on exams. Students may use their books and notes for the Reading Questions and Problem Sets. While collaboration is allowed on these homework assignments, each student must submit their own write-up in their own words.

Accommodations for Students with Disabilities: If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Statement of Intent for Inclusivity: As a member of the Georgia Tech community, I am committed to creating a learning environment in which all of my students feel safe and included. Because we are individuals with varying needs, I am reliant on your feedback to achieve this goal. To that end, I invite you to enter into dialogue with me about the things I can stop, start, and continue doing to make my classroom an environment in which every student feels valued and can engage actively in our learning community.

Schedule: (subject to change)

1. Introduction and overview

Week 1 (1/8):

Observing the Ocean

Origin and Cycling of Water and Salt

Reading: Ch 1, 2, Ch 6 (p 174-179)

2. Marine geology and geophysics

Week 2 (1/15):

Plate Tectonics and the origin of ocean basins

Activity: Bathymetry from space (bring laptop)

Reading: Ch. 3,4

Week 3 (1/22):

Sea-Level

Beaches and Shorelines

Reading: Ch 11

Week 4 (1/29):

Marine sediments

Activity: Exploring multi-beam data

Reading: Ch 5

Week 5: (2/5)

Introduction to Paleooceanography

EXAM 1: Thursday February 7

3. Physical oceanography and climate dynamics

Week 6 (2/12):

Waves and Tides

Activity: Tides and Tsunamis

Reading: Ch 9,10

Week 7 (2/19):

Ocean-Atmosphere heat and freshwater transfer

Reading: Ch 6 (p. 183-187), Ch 7

Ocean Circulation 1

Week 8 (2/26):

Ocean Circulation 2

Activity: Surface Drifters

Reading: Ch 8 (p. 230-247), Talley Ch 7 (7.1-7.6)

Week 9 (3/5):

Equatorial Circulation, El Niño and Indian Monsoon

Deepwater properties and circulation

Reading: Ch 8 (p 247-262), Chapter 6 (p 164-173, p. 187-191)

Week 10 (3/12):

EXAM 2: Tuesday March 12

4. Ocean Biogeochemical Cycles

Week 10 (3/14):

Ocean Productivity and Nutrients

Reading: Reading: Ch 14, Sigman and Hain:

<http://www.nature.com/scitable/knowledge/library/the-biological-productivity-of-the-ocean-70631104>

Week 11 (3/26):

Nutrient Cycling and Oxygen

Activity: Gulf of Mexico Dead Zone

Week 12 (4/2):

Oceanic Carbon Cycling

Anthropogenic Carbon and Climate Change

Reading: Ch 6 (p 181-183), Ch 7 (p 219-227), Barker and Ridgewell

<http://www.nature.com/scitable/knowledge/library/ocean-acidification-25822734>

5. Biological oceanography

Week 13 (4/9):

Marine Habitats, Ecology, and Fisheries

Polar and Coral Reef Ecosystems

Reading: Ch 13, 16, 17

Week 14 (4/16):

Temperate Ecosystems and Seasonality

Activity: Squid Fishery

Week 15 (4/23):

Review and Final preparation

Final Exam

Tuesday, April 30 2:40-5:30 pm

Campus Resources for Students

In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

Academic support

- Center for Academic Success <http://success.gatech.edu>
 - 1-to-1 tutoring <http://success.gatech.edu/1-1-tutoring>
 - Peer-Led Undergraduate Study (PLUS) <http://success.gatech.edu/tutoring/plus>
 - Academic coaching <http://success.gatech.edu/coaching>
- Residence Life's Learning Assistance Program (<https://housing.gatech.edu/learning-assistance-program>)
 - Drop-in tutoring for many 1000 level courses
- OMED: Educational Services (<http://omed.gatech.edu/programs/academic-support>)
 - Group study sessions and tutoring programs
- Communication Center (<http://www.communicationcenter.gatech.edu>)
 - Individualized help with writing and multimedia projects
- Academic advisors for your major (<http://advising.gatech.edu/>)

Personal Support

Georgia Tech Resources

- The Office of the Dean of Students: <http://studentlife.gatech.edu/content/services>; **404-894-6367**; Smithgall Student Services Building 2nd floor
 - You also may request assistance at https://gatech-advocate.symplicity.com/care_report/index.php/pid383662?
- Counseling Center: <http://counseling.gatech.edu>; **404-894-2575**; Smithgall Student Services Building 2nd floor
 - Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
 - *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at **404-894-2204**.*
- Students' Temporary Assistance and Resources (STAR): <http://studentlife.gatech.edu/content/need-help>
 - Can assist with interview clothing, food, and housing needs.
- Stamps Health Services: <https://health.gatech.edu>; **404-894-1420**
 - Primary care, pharmacy, women's health, psychiatry, immunization and allergy, health promotion, and nutrition
- OMED: Educational Services: <http://www.omed.gatech.edu>
- Women's Resource Center: <http://www.womenscenter.gatech.edu>; 404-385-0230
- LGBTQIA Resource Center: <http://lgbtqia.gatech.edu/>; 404-385-2679
- Veteran's Resource Center: <http://veterans.gatech.edu/>; 404-385-2067
- Georgia Tech Police: 404-894-2500