

GEOL 107-L OCEANOGRAPHY Fall 2018

This course introduces the role of the oceans in the Earth system. We will consider plate tectonics and how these processes were discovered. We will learn about how the atmosphere and ocean interact, why water moves in the ocean, where life flourishes in the oceans and how the Earth system has changed through time. Students will learn about the methods that scientists use to develop and test new ideas in the Earth Sciences, illustrated with hands-on examples in the laboratory section. We will consider the scientific aspects of new and emerging economic resources in the oceans as well as problems of environmental change, pollution, and resource depletion. Such issues and opportunities are ever changing; thus we invite students to develop the scientific skills needed to assess new problems, new information and developments in the future.

Professor: Dr. Sarah Feakins
feakins@usc.edu (best way to contact me)
Office hours: Wednesday 10-12 ZHS 223F

TAs: will be announced in week 1

Lectures: MW 3.30-4.55pm, Location: Taper Hall THH 201

Technology: Participation in lectures via TopHat classroom response system:
<https://app.tophat.com/e/284873>. Purchase subscription in the week before classes (see **Participation Technology** more info). We use this on day 1.

Textbook: **Essentials of Oceanography**, Trujillo & Thurman Prentice Hall.
(12th Ed.) ISBN-13: 978-0134073545 from bookstore.
Tips: To save money and the planet you are encouraged to purchase used copies. Old editions cover the same topics, but chapter and page numbers differ and some of the examples have been updated in the current version.

Labs: ZHS B61, start in week 2. See lab syllabus.

Basis of Grade: 30% lab (you must pass the lab to pass the class)
10% participation (via TopHat)
30% midterm exam
30% final exam

Lecture Schedule & Assigned Reading

*Chapters in Trujillo and Thurman—Essentials of Oceanography—12th Ed.

Recommend reading the chapter before the corresponding lecture to come prepared for class.

| Week | Date | Lecture Subject | Reading* | Your Notes |
|------|----------|--|----------|------------|
| 1 | 8/20/18 | Dive in: ocean origins, ocean science | 1 | |
| | 8/22/18 | History of ocean travel, exploration and learning | | |
| 2 | 8/27/18 | Plate tectonics: gathering the evidence for motion | 2 | |
| | 8/29/18 | Plate tectonics: earthquakes, volcanoes and risk | | |
| 3 | 9/3/18 | HOLIDAY – LABOR DAY | | |
| | 9/5/18 | Mapping ocean basins & marine sediments | 3-4 | |
| 4 | 9/10/18 | The special properties of water | 5 | |
| | 9/12/18 | The temperature and saltness of seawater | | |
| 5 | 9/17/18 | Winds that stir the surface ocean | 6 | |
| | 9/19/18 | Surface ocean circulation – currents | 7 | |
| 6 | 9/24/18 | El Niño Southern Oscillation | | |
| | 9/26/18 | Deep ocean circulation | | |
| 7 | 10/1/18 | Waves & tides | 8-9 | |
| | 10/3/18 | Coastlines – beaches, estuaries and deltas | 10 | |
| 8 | 10/8/18 | Dam that erosion from land to sea | | |
| | 10/10/18 | MIDTERM EXAM | | |
| 9 | 10/15/18 | Systematics of Marine Biology | 12 | |
| | 10/17/18 | Nutrients and food webs | 13 | |
| 10 | 10/22/18 | Fisheries & our impact on ocean ecosystems | | |
| | 10/24/18 | Pelagic ocean & deep ocean – adaptations of life | 14 | |
| 11 | 10/29/18 | Marine mammals | | |
| | 10/31/18 | Managing California’s coastal oceans | 15 | |
| 12 | 11/3/18 | Coral reef biodiversity hotspots in peril | | |
| | 11/5/18 | Human impacts: pollution – old foes | 11 | |
| 13 | 11/10/18 | Human impacts: pollution – emerging problems | | |
| | 11/12/18 | Oceans of the past | 16 | |
| 14 | 11/19/18 | Drivers of change | | |
| | 11/21/18 | HOLIDAY – THANKSGIVING | | |
| 15 | 12/3/18 | Our changing oceans | | |
| | 12/5/18 | Solutions | | |
| | 12/10/18 | FINAL EXAM Note time: 2-4pm, Monday December 10th 2018 | | |

Participation Technology

We will be using the TopHat (www.tophat.com) classroom response system. Questions will be mostly posed in lectures and sometimes assigned to be completed before the next class (e.g. questions on reading). You will be scored for answering (not correctness), allowing you to test your knowledge.

What device do I need to bring to class? You can answer with Apple or Android smartphones, a web browser on a laptop, or through text message. *Have trouble?* Try connecting with a web browser rather than your phone. Or see <https://support.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide>

How can I register for TopHat? A link will be sent to your school email account a week before class, or you can register at <https://app.tophat.com/e/284873>. Subscription costs \$26 for the semester. *Not sure if you will stay in the class?* Text in the answers, then register within 7 days. Please make sure to use your official first name, last name, USC ID and USC email address to match the USC roster.

Missed a lecture? You will learn best if you attend class and take notes during lecture, however you may have a sick day or a USC athletic event that keeps you from class. To catch up read the textbook and lecture slides which are posted on Blackboard after class.

How will lecture absences or technical glitches (e.g. uncharged device) affect my participation grade? I provide a **20% waiver** on TopHat participation, which is sufficient to allow for university approved athletic absences, as well as a generous provision in case of the odd technical glitch, job interviews, extracurricular conflicts, or sickness. *How does this waiver work?* If you participate 80% of the time you will receive 100% for participation. If you are absent more than 20% of the time your participation score will reflect this. *When will I see this waiver credit?* After the last class when I download the whole class participation % from Tophat, anyone with over 80% will see 100% on blackboard – and this grading will occur after the last class of the semester.

Examinations

The midterm and final examination evaluate your comprehension of the lecture course material. The midterm tests material in the first half of the course. The final exam focuses on the second half of the course, but concepts draw on your knowledge from the whole course – all USC final examinations are expected to be integrative assessments. All exams are multiple choice, graded by Scantron. Make-up examinations are generally not permitted except in extreme circumstances e.g. health emergency. If you have to miss an examination because of illness or a USC-sanctioned athletic competition, you must inform the Professor by email **in advance of the exam start time** and provide documentation.

Optional Extra: JEP Service Learning

You may apply for a service learning opportunity through the USC Joint Education Project (JEP): <https://dornsife.usc.edu/joint-educational-project/> JEP places USC students in classrooms to enrich education at local schools. The commitment involves a steady commitment to engage with ocean science course material throughout the semester – a great way to improve your understanding and a great way to help the local community. Successful fulfillment of the JEP placement teaching Oceanography in local schools, is recognized with extra credit in the 107 grade of up to a partial grade, eg B to B+, dependent upon performance report from JEP instructor. Prior participants have found this a very rewarding experience. *No other extra credit opportunities are available at any time or for any reason.*

Learning Objectives (adapted from those of [GE-E, Physical Sciences](#))

All USC students should have a basic grasp of scientific methods; to understand how models of the natural/living world are established and how researchers test the validity of these models using empirical evidence. They should have familiarity with many of the major scientific ideas of the modern world. Students will learn the major techniques of research and investigation, analysis and problem-solving, that provides the basis for discovery and validation in Oceanography. Scientific methods of discovery and research provide the means for confirmation and falsification of conjectures and hypotheses. **USC students need to understand how data is generated, presented and interpreted and how scientific discovery spurs technology growth and impacts society.** This Oceanography course includes a laboratory component with hands-on observations, and campus and museum visits, in which data are collected, analyzed and interpreted.

The physical sciences deal with analysis of natural phenomena through quantitative description and synthesis. Students will learn to solve scientific problems and to understand the processes by which scientific knowledge is obtained, evaluated and placed in the context of societal relevance.

Most GE instructors at USC are Life and Physical Scientists with active laboratory, model-based and field research programs. The USC GE student gets a window into the research world with such a faculty, has opportunities that extend beyond the classroom, and are given an insider's perspective of cutting-edge research in the sciences.

About Professor Feakins

In 2018 Professor Feakins is a featured lecturer for the International Ocean Discovery Program giving talks around the country. She runs an organic geochemistry laboratory on campus and maintains an active research program with graduate students and undergraduate researchers pursuing Earth Science degrees. She has been teaching at USC for ten years.

What to expect

This is a large volume course with 230 students in an auditorium. Information delivery is primarily via the traditional method of lectures. Students should actively engage by reading the textbook before class, taking notes during lecture and thinking about the topics being presented, and participating in lectures through the TopHat engagement software (questions and discussions). Assessment is via multiple-choice exams graded via scantron. Students who delve into the topics in the news as well as by following the links presented in lecture, have a richer experience from the course. Students who do such research and have Oceanography related experiences or information to share are welcome to contribute to discussions.

Smaller ratios are found in the lab sections where 15 students will learn in hands-on activities (graded by completion) with weekly quizzes on the prior week to assess comprehension, taught by laboratory instructors currently pursuing active research towards doctoral degrees in the Earth Sciences department.

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu