

# Geol 459/559 (Micro 459/559) Introduction to Oceanography

University of Tennessee — Fall 2013

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## BASIC COURSE INFORMATION

- Lectures → MWF 1:25 pm-2:15 pm, Earth & Planetary Sciences, Rm. 400
  - Instructors → Dr. Linda Kah (EPS Rm. 214, Ph. 974-6399, [lkah@utk.edu](mailto:lkah@utk.edu))  
Dr. Steven Wilhelm (SERF Rm. 637, Ph. 974-0665, [wilhelm@utk.edu](mailto:wilhelm@utk.edu))
  - Grader → Kathleen Brannen (EPS Rm. 112, [kbrannen@utk.edu](mailto:kbrannen@utk.edu))
  - Instructor Office Hours → M-F, by e-mail or phone appointment
  - Textbook → Trujillo & Thurman, Essentials of Oceanography (10<sup>th</sup> Edition), Prentice Hall
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## COURSE OVERVIEW

This course will introduce students to a variety of aspects of physical, chemical, and biological oceanography, and will help them integrate these varied disciplines in an exploration of the Earth's past, present, and future oceans. The course book and design should allow active participation of students from a variety of scientific disciplines; interdisciplinary interaction will help us all view the oceans in a different light.

The course is primarily lecture-based. Readings from the textbook are designed to get everyone on the same page of the playbook, and will be supplemented throughout the semester by assigned readings from the scientific literature. Lectures will cover materials in more detail than the book; auxiliary readings will be assigned in class and posted on Blackboard; lecture attendance is essential for understanding course topics. Students will also form small groups to explore, in detail, an oceanographic concept or issue. Results of investigation will be presented to the class. In addition, graduate students will prepare three short summary papers (one each within the broad topics of physical/chemical oceanography, biological oceanography, and complex oceanographic issues) that explore and summarize a topic of current oceanographic research.

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## LEARNING OBJECTIVES

Introduction to Oceanography will serve the following learning objectives:

- Demonstrate knowledge of oceanographic principles and processes
  - Demonstrate critical thinking through the integration of multidisciplinary concepts
  - Demonstrate communication skills through both writing and oral presentation
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## GRADING AND ASSESSMENT

Note: Final course grades will be based on individual grade distributions for undergraduate and graduate students. Up to 2% extra credit may be assigned on the basis of class participation and attendance at ocean-related seminars in both EPS and MICRO departments; students will be provided a list of potential seminars on the first day of class. Make-up assignment must be scheduled with professors.

### *UNDERGRADUATE STUDENTS*

- Tests → 25% (3 tests, to total 75%)
- Term Project Presentation → 25%

### *GRADUATE STUDENTS*

- Tests → 12% (3 tests, to total 36%)
  - Short Papers → 15% (3 papers, to total 45%)
  - Term Project Presentation → 19%
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## LECTURE SCHEDULE AND TOPICS

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### *PART I – PHYSICAL AND CHEMICAL OCEANOGRAPHY*

W Aug. 21	– Course overview	T&T Ch 1
F Aug. 23	– Plate Tectonics	T&T Ch 2, 3
M Aug. 26	– Structure of ocean basins	T&T Ch 2, 3
W Aug. 28	– Ocean-atmospheric interactions	T&T Ch 6
F Aug. 30	– Ocean circulation	T&T Ch 7
M Sept. 2	– Waves and tides	T&T Ch 8, 9
W Sept. 5	– Ions and their origins	T&T Ch 5
F Sept. 6	– Alkalinity and the oceans	T&T Ch 5
M Sept. 9	– NO CLASS (LABOR DAY HOLIDAY)	
W Sept. 11	– Basics of biological cycling	T&T Ch 12, 13
F Sept. 13	– Genesis of marine sediments	T&T Ch 4
M Sept. 16	– Diagenesis of marine sediments	T&T Ch 4
W Sept. 18	– <b>TEST 1: Physical and Chemical Oceanography</b>	

### *PART II – BIOLOGICAL OCEANOGRAPHY*

F Sept. 20	– Are there sea monsters?	TBA
M Sept. 23	– Phytoplankton and primary productivity	T&T Ch 13, 14
W Sept. 25	– Zooplankton and secondary productivity	T&T Ch 13
F Sept. 27	– GUEST LECTURER	TBA
M Sept. 30	– Bacteria and the microbial loop	T&T Ch 13
W Oct. 2	– Marine viruses	TBA
F Oct. 4	– Charismatic macrofauna	T&T Ch 14
M Oct. 7	– Coral Reefs	T&T Ch 15
W Oct. 9	– “Here there be pirates”	TBA
F Oct. 11	– <b>TEST 2: Biological Oceanography</b>	

### *PART III – COMPLEX TOPICS IN OCEANOGRAPHY*

M Oct. 14	– SPECIAL SEMINAR – Dr Ben Twining	TBA
W Oct. 16	– El Nino and the oceans	TBA
F Oct. 18	– NO CLASS (FALL BREAK)	
M Oct. 21	– SPECIAL SEMINAR – Dr. Julie Kubanek	TBA
W Oct. 23	– Hydrothermal vents	TBA
F Oct. 25	– Polar oceans and life	TBA
M Oct. 28	– Down in the mud – benthic life	TBA
W Oct. 30	– GUEST LECTURER	TBA
F Nov. 1	– Climate change and the oceans	T&T Ch 16
M Nov. 4	– Ocean acidification	TBA
W Nov. 6	– Climate proxies 1	TBA
F Nov. 8	– Climate proxies 2	TBA
M Nov. 7	– Circulation proxies	TBA
W Nov. 11	– Oceanic events in Earth’s past	TBA
F Nov. 13	– <b>TEST 3: Complex Topics in Oceanography</b>	

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## LECTURE SCHEDULE AND TOPICS — CONTINUED

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*PART IV – PRESENTATIONS OF TERM PROJECTS*

M	Nov. 18	– Student presentations	TBA
W	Nov. 20	– Student presentations	TBA
F	Nov. 22	– Student presentations	TBA
M	Nov. 25	– Student presentations	TBA
W	Nov. 27	– Student presentations	TBA
F	Nov. 29	– NO CLASS (THANKSGIVING BREAK)	
M	Dec. 2	– Wrap-up discussion	