

GEOL4365/5310 Physical Oceanography



Instructor: Prof. Arne Winguth (Email: awinguth@uta.edu; Ph: 817 272 2977)

Time: MWF 11:00-11:50 pm, GS Rm 104, Lab M 3:00-3:50 pm Rm 202

Text:

Stewart, R., Introduction to Physical Oceanography,
http://oceanworld.tamu.edu/home/course_book.htm

Additional books of interest

Talley L.D., Pickard G.L., Emery W.J., Swift J.H., 2011. Descriptive Physical Oceanography: An Introduction (Sixth Edition), Elsevier, Boston, 560 pp.

Open University Course Team, Ocean Circulation, Publisher: Butterworth-Heinemann, Paperback, 240pp, Series: Open University Oceanography Ser., ISBN: 0080363695

Pond, S., and G.L. Pickard, 1983: Introductory Dynamical Oceanography. 2nd edition, 329pp, Butterworth-Heinemann.
ISBN 10: 0-7506-2496-5
ISBN 13: 978-0-7506-2496-11.

Marshall, J. and R. Plumb -Atmosphere, Ocean and Climate Dynamics –Academic Press, ISBN 9780125586917, 2008

Course description:

This course offers an introduction to physical processes in the oceans. The oceans are an important part of the global climate system. Changes in the global climate system, such as global warming, do influence the immense amount of heat, moisture, and momentum stored in the ocean. In this course, we will introduce some elementary knowledge of the ocean, its circulation, and its impact on the global climate. Prereq: general physics, and calculus or cons. instr.

Course Policies and Grading

Grading and Grade Calculation:

<u>Grading:</u>	Lab Portion:	25% of course
	Lecture Portion:	75% of course
	Lecture Portion:	
	Quizzes (best 3 of 4)	15% of course (5% each)
	Exams (1)	15% of course
	Project(1)	15% of course
	Final Exam	30% of course

Final grade calculation:

$0.25 \times \text{lab} + 0.15 \times \text{quizzes} + 0.15 \times \text{exams} + 0.15 \times \text{project} + 0.30 \times \text{final exam}$

Score will be translated into a grade based on class average.

Grades will not be released over the phone or by email. Grades must be either obtained in person or from the UTA online database.

Grading: Lecture Portion: 75% of course; Lab Portion: 25% of course

Exams:

Exams will be problem exercises and multiple-choice questions.

Exams must be taken at the scheduled time. Make-up exams can be only taken in cases of illness or family emergency. A note from the University disciplinary officer or doctor may be required in these cases. Students who do not take an exam receive zero points as a grade on that exam. Make-up exams are scheduled and set by the instructor.

Quizzes:

Lecture quizzes are not announced. The 3 best quizzes will be counted towards the total grade. There are no make-up quizzes.

Field trip:

Is strongly recommended (corresponding to 2.5 lab extra credit).

Project paper:

The project paper has to be written in own words in a scientific style. Identical copy of a term paper from web or other sources (plagiarized papers) will result in an F.

Graduate students have to give an oral presentation of the project paper (20 minutes including discussion).

Required Readings:

Readings listed on the syllabus should be completed before the lecture. The lectures will be designed with the assumption that you have a basic understanding of the assigned material.

Attendance:

Attendance is required and may be taken occasionally. Lack of attendance may influence the final grade.

Students with Disabilities (*Americans With Disabilities Act*):

Students with disabilities should consult with me at the beginning of the semester for appropriate accommodation.

Academic Integrity:

Academic dishonesty (such as cheating, plagiarism, taking an exam for another person, etc.) will not be tolerated in any form and will be disciplined in accordance with University regulations and procedures.

Student Support Services:

The University supports a variety of student success programs. They include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.

Cell Phones: Use of cell phones are not permitted during lecture

Class Material: <https://elearn.uta.edu/webapps/login/>

Blackboard Info: <http://www.uta.edu/blackboard/students/index.html>

SYLLABUS GEOL 4365/5310 Physical Oceanography Spring 2012

Chapter	Days	Topics	Reading Text ¹	Problem Sets
1	Jan. 18	Historical Review	1-2	
2	Jan. 20	Physiography of the Oceans Dimensions, bathymetry, echosounding	3	#1: Ch. 2 Sept. 3
3	Jan. 23, 25, 27	Atmosphere Radiation, wind system, wind stress	4	#2: Ch. 3 Sept. 17
4	Jan. 30 Feb. 1, 3,	Oceans Heat Budget Heat budget and transport, and its variability	5	#3: Ch.4 Sept. 24
5	Feb. 6, 8, 10	Temperature, Salinity, and Density Measurements and concepts	6	#4: Ch. 5 Oct. 1
6	Feb. 13, 15, 17	Equations of Motions Momentum and mass conservation	7	#5: Ch. 6 Oct. 8
7	Feb. 20, 22	Turbulence and Mixing Viscosity and eddy mixing	8	
1. EXAM	Feb. 24	Material Chapter 1-7	1-7	
8	Feb. 27, 29	Response of Currents to Wind Ekman transport, Langmuir circulation	9	#6: Ch. 7&8 Oct. 22
9	Mar. 2, 5, 7	Geostrophic Currents Hydrostatic equilibrium and geostrophy	10	
	Mar. 12-16	SPRING BREAK Mar. 12-16		
10	Mar. 19, 21, 23	Wind Driven Circulation Sverdrup & Munk theory, equatorial currents	11, 14	#7: Ch. 9&10 Nov. 5
Fieldtrip	Sat. Mar. 24	Lake Arlington Fieldtrip Rain date: April 31.	Class notes	8:30 – 2pm
11	Mar. 26, 28, 30	Deep Sea Circulation Stommels and Arons theory	13	#8: Ch. 11 Nov. 12
12	April 2, 4, 6	Waves Shallow and deepwater waves, Tsunamis	16	#9: Ch. 12 Nov. 17
13	April 9, 11, 13	Tides Theory of tides and prediction of tides	17	
14	April 16, 18, 20 April 23, 25, 27	Climate Change & Variability Present and future, ENSO, AMO, PDO	14, 15 & notes	
Final Paper	April 30	Final Due Date Project Paper		
15	April 30 May 2, 4	Review Week		
Session	April 30	Gradute Student Project Presentations		20 min each
FINAL	May 9 11:00 am – 1:30 pm	FINAL EXAM		

¹ Stewart, R., Introduction to Physical Oceanography,