MAR-S 352 - Fall 2016
Introduction to Physical Oceanography and Laboratory

School of Marine and Atmospheric Sciences, Stony Brook University

Lecture: Tuesday 9:30 - 11:20am, Stony Brook - Southampton Campus
Room: Marine Station 215, Duke Lecture Hall, Chancellors Hall 112
Lab Section 1: Thursday 9:30am - 12:30pm
Lab Section 2: Thursday 2:30pm - 5:30pm
Room: Atlantic Ocean, Local Bays, Marine Station, Southampton SINC site (CH 142)

Instructor Information

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Office Hours	:	Tu 13:30–15:30 or by appointment
Teaching Assistants	:	Zoe Smith (Zoe.Smith@stonybrook.edu
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		Office Hours: TBD

Course Description

An introduction to the physical properties, motion of, and forces that drive the movement of fluids (air and water) on the earth. Physical oceanographic processes that range in scale from several mm to 1000s of km will be studied. This course will introduce the student to the physics of the marine environment and the tools (physical, mathematical, scientific) to study these waters. Environments ranging from pelagic to estuarine will be examined.

Course fulfills the Pursue Deeper Understanding (STEM+) General Education requirement.

Course Learning Objectives

- Identify the physical properties, motion of, and forces that drive the movement of fluids (air and water) on the earth.
- Describe physical oceanographic processes that range in scale from several mm to 1000s of km.
- Use the scientific method and a variety of tools (including data collection, physics and mathematical principles) to study these processes.

- Measure the physical characteristics and use this information to characterize marine environments ranging from pelagic to estuarine.

Prerequisites

MAT 127, 132, or 142 Calculus PHY 119, 121, 125, or 131 Physics

Textbook

Required	:	Talley et al., *Descriptive Physical Oceanography, 6th Edition* Book should be available at the Stony Brook bookstore and a copy will be on reserve in the Main library. Hardcover or Electronic Version is fine. Supplementary readings for hardcover edition are available online.
Optional	:	Robert H. Stewart, *Introduction to Physical Oceanography*
	:	John A. Knauss, *Introduction to Physical Oceanography, 2nd Edition*

Grading

Your grade in the course will be earned / calculated as follows:

Problem sets	18%
Quizzes	5%
Exams (total)	27%
Final exam	15%
Class participation	5%
Lab component	30%

This scale serves as a general guideline, however grades may be curved depending on the performance of the class. Plus and minus letter grades will be given where appropriate.

A, A-	→	90	–	100
B+, B, B-	→	80	–	89
C+, C, C-	→	70	–	79
D	→	60	–	69
F	→	0	–	59

Student Expectations

Students will attend class, be courteous, and do their best. Students will be prepared and active participants in the learning process.

Electronic Device Policy

No electronic devices [of any kind including audio devices] are to be used in the classroom and lab unless you have received explicit permission from the instructor. With instructor permission certain devices (e.g. laptops) may be used to take notes during lecture. During labs, electronic devices may be used [with instructor permission only] for academic purposes (e.g. recording the time of gear deployment) only. All devices not in use should be off or in silent/vibrate mode and remain in your bag, purse, pocket, etc. Students who do not follow these guidelines will be asked to leave the class/lab immediately (note: this may involve swimming). This applies during any part of the lecture/lab (including breaks, transit to the boat, etc). Do not answer calls during class or lab. Text messaging is not allowed during class or lab. YOU are responsible for ensuring this policy is followed.

General Course Rules

Late Assignments will not be graded except for exceptional circumstances.

All problem sets will be submitted via BLACKBOARD. Preferably as pdf files. I don't care if you submit a document file or if you hand write your assignment and scan/photograph it and turn that in – as long as your work is legible. **Keep a copy of any assignment you turn in!**

For every assignment in this class, you are expected to 1) SHOW YOUR WORK; 2) INCLUDE UNITS; and 3) PROVIDE AN EXPLANATION FOR ANY FIGURES or GRAPHS that are in the assignment. Failure to do any of those three things will result in the loss of significant points on the assignment.

No food in lecture or lab rooms. Food may be brought (and eaten) during labs on the boat. However, you may barf it up.

Independent Work
Most of your assignments (including lab reports) are meant to be done by an individual student. While you are free to discuss problems and questions with your fellow students; each student must complete all parts of the assignment independently. Students who do not follow this requirement will receive a zero on the assignment, may have their final grade decreased, and will be referred to Academic Judiciary for further discipline. This applies to any students involved in academic dishonesty (copiers and copy-ees alike).

Group Work
Much of the data collection and analysis will require you to work with other students to reach your final goal. All students whose names are on the final report are expected to have contributed substantially to the final product.

Problem Sets

Problem sets will be posted online (or via email) are due at the beginning of the next class meeting unless otherwise indicated.

There will be approximately 6-8 problem sets for this course which make up 20% of your final grade. Doing poorly on the problem sets (or not doing them at all) will ensure you a poor grade.

Weekly Quizzes

Weekly quizzes will be given (or not) at any time during the class period. The quizzes will be closed book and notes, short answer format, and will be based on the assigned reading assignments and material from the previous class.

Exams

Exams are comprehensive but will focus on material presented since the previous exam.

Lab Assignments

Lab reports are typically due either at the end of the lab period or the beginning of the next class period. The instructor will inform you of what the deadline is at the end of the lab period.

Assignment Submittal
Assignments will be submitted via blackboard. Students should not email assignments to the professor or TAs unless specifically requested. Assignments should consist of a SINGLE FILE (preferably a pdf) containing all figures, graphs, text, calculations, etc.

Ocean Data View
You will be using a software program called Ocean Data View to assist you in analyzing the data that we collect during our labs (and you may find it useful elsewhere too). It is free for educational use and available for all computer platforms (Windows, Linux/Unix, and Mac); so you may wish to install it on your own computer. The website for the program is: http://odv.awi.de/ It is a great program, but not without its own "features" which you will soon discover.

Absences
Any unexcused absence from a laboratory will result in a significant loss of points towards

your final course grade. We do not wait for tardy students. If you are not attending lab, YOU are responsible for informing the professor ahead of time (by email or phone at least one hour prior to class start) that you will not be there. Informing the instructor that you can not attend the lab does not make your absence "excused". You are responsible for any material, data, analysis, or assignment that was covered during that lab. In short, do not miss lab.

Academic Honesty

If you are caught cheating on any assignment in the class, you will automatically fail that assignment and I reserve the right to give you a failing grade for the course.

Blackboard

You can access class information, documents, and assignments on-line at: http://blackboard.sunysb.edu You should be sure to consult it at least once a week; ideally, you would log on before every class. Blackboard will be used to post class-related announcements. It is your responsibility to make sure that the email you check is the one you have marked as preferred on SOLAR so that you will receive copies of announcements. If you used Blackboard during the previous semester, your login information (Username and Password) has not changed. If you have never used Stony Brook's Blackboard system: for help or more information see: http://www.sinc.sunysb.edu/helpdesk/docs/blackboard/bbstudent.php For problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site , you can also call: 631-632-9602 or e-mail: helpme@ic.sunysb.edu

Electronic Communication Statement

Email and especially email sent via Blackboard (http://blackboard.stonybrook.edu) is one of the ways the faculty officially communicates with you for this course. It is your responsibility to make sure that you read your email in your official University email account. For most students that is Google Apps for Education (http://www.stonybrook.edu/mycloud), but you may verify your official Electronic Post Office (EPO) address at http://it.stonybrook.edu/help/kb/check or-changing-your-mail-forwarding-address-in-the-epo.

If you choose to forward your official University email to another off-campus account, faculty are not responsible for any undeliverable messages to your alternative personal accounts. You can set up Google Mail forwarding using these DoIT-provided instructions found at http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail. If you need technical assistance, please contact Client Support at (631) 632-9800 or supportteam@stonybrook.edu.

Stony Brook University Required Syllabus Information

Americans with Disabilities Act: If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or http://studentaffairs.stonybrook.edu/dss/. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.sunysb.edu/ehs/fire/disabilities.shtml

Academic Integrity: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another persons work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the Academic Judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students ability to learn.

Lecture Calendar

Please understand that this schedule is subject to change.

Date		**Topic**	**Reading Assignment**
Tue	30 Aug	Syllabus, Introduction and History	Ch. 1, S1
Tue	06 Sep	No Class	
Tue	13 Sep	Physical Environment of the Ocean	Ch. 2, S16
Tue	20 Sep	Seawater Properties and Distributions	Ch. 3,4
Tue	27 Sep	Mass Budgets - **Exam I**	Ch. 5
Tue	04 Oct	Salt and Heat Budgets	Ch. 5
Tue	11 Oct	Wind Forcing, Data Analysis	Ch. 6
Tue	18 Oct	Dynamical Processes	Ch. 7, S7
Tue	25 Oct	Ocean Dynamics - **Exam II**	Ch. 7, S7
Tue	01 Nov	Ocean Waves	Ch. 8, S8
Tue	08 Nov	Ocean Waves	Ch. 8, S8
Tue	15 Nov	Ocean Tides	Ch. 8, S8
Tue	22 Nov	Ocean Acoustics - **Exam III**	TBD
Tue	29 Nov	Climate and the Oceans	Ch. S15
Tue	06 Dec	Global Processes	TBD
XXX	13-21 Dec	**Final Exam** - Date and Time TBA	

Laboratory Description

An introduction to the measurements, equipment, and data processing techniques used to study the motion of fluids (air and water) on the earth. Students will learn to use scientific instruments, design sampling strategies, and utilize previously collected data sets to study both local and global processes. At-sea collection and analysis of data will be emphasized.

Depending on weather and ship availability, there may be some labs that occur at times different than the scheduled lab period. The instructor will work to ensure as many students as possible will be able to participate in these labs, however if students are unable to attend the field labs outside of the scheduled class period, there will be an alternative lab they will need to complete in place of attending the labs.

Grading

Your grade for the laboratory portion of the course will be earned / calculated as follows:

Lab Performance and Participation	10%
Lab Reports	75%
Lab Practical Exam	15%

Student Expectations

Students will attend class, be courteous, and do their best. Students will be prepared and active participants in the learning process. Students will be prepared for lab activities (i.e. appropriate clothing for going out in the field or on the boat). Closed toe shoes must be worn on the research vessel. This means NO flip-flops, sandals, five-finger or other individualized-toe-footwear. Sneakers or boots are a good choice as there will likely be water on the deck while we are working.

Cell phones are not to be used for any purpose during the lab period without the permission of the Instructor, TA, or Captain. Unauthorized use of a cell phone for non-class purposes (texting, phone calls) during the lab period will immediately result in a zero for that day's lab assignment.

A notebook (or clipboard with paper) and pen/pencil are required for all at-sea labs. It is a good idea to wear a watch as well. You may want to bring a camera, but realize it may get wet.

Laboratory Calendar

Please understand that this schedule is subject to change. In particular, weather will play a primary role in determining whether or not we will be inside or in the field for lab. Always assume that we will be going outside (whether its raining, snowing, or sunny) and dress appropriately.

Date		**Topic**	**Reading**
Th	01 Sep	Introduction to Marine Sampling [meet at Marine Station]	
Th	08 Sep	Introduction to Ocean Data View	
Th	15 Sep	Inlet Profiling	
Th	22 Sep	Ocean Data View Analysis	
Th	29 Sep	Inlet Profiling II	
Th	06 Oct	Ocean Sampling	
Th	13 Oct	Shinnecock vs Peconic	
Th	20 Oct	Salt Wedge	
Th	27 Oct	Circumnavigating Shelter Island	
Th	03 Nov	Weather Forecasting	
Th	10 Nov	Waves and Tides	
Th	17 Nov	Geostrophic Velocity	
Th	24 Nov	Thanksgiving Break - No Lab	
Th	01 Dec	Spatial Data Analysis	
Th	08 Dec	Lab Practical Exam	
XXX	XX Dec	**No Final Exam**	