SMS 303: IMS Physics Module Fall 2010

SYLLABUS

Date 2010	Lecture	Lab
10/7/2010	Diffusion	Playing with cards and diffusing in the hall
10/14/2010	Mixing	From shear induced instabilities to double diffusion
10/21/2010	Tides	Computer exercise
10/28/2010	Waves – From sound and light to internal and external gravity waves and their characteristics.	Sloshing back and forth
11/4/2010	Rotation effects: how the Earth rotation changes how objects and fluid move on the Earth.	Rotating tables, Taylor column and more.

This module focuses on using physical principles, concepts and approaches to explain observed phenomena in aquatic sciences. The course emphasizes hands-on activities; at least half the time in the class will be devoted to laboratory sessions. The course is intended for 3rd/4th year students in SMS and requires that students have taken and passed (at least with a C-) SMS204 and Physics I & II. The class will meet for 2 → 2.5 hours every week; usually the first period is a lecture/discussion/demonstration, the second period is a lab.

Goals of this module are to:
• develop your understanding and communication of error in measurements (*cf.* rubric);
• introduce you to the richness of fluid behaviors on a rotating planet;
• introduce you to the concepts of stirring and mixing;
• Further develop your appreciation for the unusual nature of water as a fluid and liquid.

Grading will be based on participation (25%), weekly assignments and quizzes (when applicable) (75%). Late assignment (less than a week later) will suffer an automatic 10% decrease in grade. More than a week later → grade=0. Homework should be emailed or handed to Artur (artur.palacz@maine.edu) by class time on the following Thursday.

Extra credit (15%): students electing to write a term paper (5 pages maximum), whose topic they discussed and agreed with the instructor. Given that this class is a 2 credits class I expect students to spend 2-4hrs a week working outside of class. If you find yourself working more than 4hrs a week for class please come see me.

At the end of each lab there will be an individual and group quiz. The purpose of this quiz is to assess that material was learned and does not affect the individual grade. Group grade will be recorded and the best overall group will be invited for pizza after the semester ends. At the end of some of the labs, groups may be randomly assigned an activity to explain to the rest of the class.

Amnesty program: Student can resubmit homework within a week from when they got them back and gain up to half the point they lost.

Conversion from numerical to letter grade is conducted as follows:

Letter grade	Numerical grade	Letter grade	Numerical grade	Letter grade	Numerical grade
A	95.00-100	B-	80.00-83.33	D+	66.67-69.99
A-	90.00-94.99	C+	76.67-79.99	D	63.34-66.66
B+	86.67-89.99	C	73.34-76.66	D-	60.00-63.33
B	83.34-86.66	C-	70.00-83.33	F	<60.00

All students are expected to adhere to the University of Maine's policy on Academic Honesty and Dishonesty, which can be found at: http://www.umaine.edu/studentaffairs/jad/honesty.asp. Any attempt to represent the work of another as your own is grounds for failure. Bear in mind that the University of Maine policy states: *an instructor who has probable cause or reason to believe that a student has cheated may act upon such evidence.*

There is no text (though some of the labs have been published and can be found at: http://misclab.umeoce.maine.edu/boss/classes/SMS_204/teaching_phys_concepts.pdf. Class materials are self contained, but just as in real life you can always improve your understanding by working with some of the additional material that is cited and by further library and internet research.

The instructor is Emmanuel Boss. His schedule involves teaching two classes. The fastest way to reach him is by e-mail <emmanuel.boss@maine.edu>. Please avoid using his First Class account because your message will be forwarded, and the extra steps needed to identify you will delay the reply. We are packing a lot into a short time: Feedback is appreciated during the semester, especially on things that you find unusually dull, interesting, confusing or clear. TA (Artur Palacz-artur.palacz@maine.edu) and Jim Loftin will help you in the lab and/or homework. Artur will grade the homework.

All class materials will be available at:
http://misclab.umeoce.maine.edu/boss/classes/SMS_303/SMS303.htm