SIO 103 COURSE INFORMATION

This course is taught by Guy Masters (x44122, gmasters@ucsd.edu) and by Dave Stegman (X20767, dstegman@ucsd.edu). Guy has an office in IGPP (Munk Lab, room 327) which is the wooden building just up the hill from Scripps library on the west side of the street. Dave's office is in IGPP Revelle Lab, building 1000 (room 1103) which is on the east side of the street. We are available to answer questions almost anytime though it is advisable to ring first before making the journey down the hill! Email is probably the most efficient way to organize a meeting with us.

1. Web site

There is a web site for the class where lecture notes, problem sets, etc will be available in pdf format. The site is http://igppweb.ucsd.edu/∼guy/sio103

2. Additional reading

The class notes are reasonably comprehensive but we recommend the following two texts for additional reading:

The Solid Earth: An Introduction to Global Geophysics by C. M. R. Fowler (2004, 2nd Edition)
Physics of the Earth; by Frank D. Stacey and Paul M. Davis (2008, 4th Edition)

The two textbooks are **not required**, but it is recommended that you use at least one of them. They are both on reserve.

3. Problem sets

Problem sheets will be handed out every week and are due one week later (on Fridays). There is a required problem session on Wednesday where we will discuss the problem sheets and any other things that crop up. Note that YOU will be doing the problems in the problem session so we recommend you look at the problem set before Wednesday.

Perhaps the hardest part of the course is learning to put a problem given in words into a mathematical form. This is a skill which is learned by practice so do the problem sheets . Once you have put the problem into mathematical form, you will be expected to solve it. If you state clearly at the outset how you are going to solve the problem, We won't be too concerned about algebraic slips made along the way. The level of mathematics that is required is quite low and the basic tool that we shall use is elementary calculus. We will try to explain any mathematical tricks as they come along. Questions 1 and 2 on the first problem sheet are typical of the problems we end up solving. They look like nasty differential equations but actually they are separable (*i.e.*, you can get all the y's on one side of the equation and all the x's on the other and then integrate). Don't forget constants of integration when you integrate – the boundary conditions are provided to allow you to evaluate the constants of integration. Questions 3 and 4 introduce a couple of tricks that you have probably seen before but may have forgotten about. If you find these problems impossibly difficult, you should come and see Guy. You will likely need to spend about 8 hours each week to do a good job on each problem set. The instructors are happy to provide help if needed.

A solution sheet will be handed out on the friday that the homework is due. This means that we can not accept late homeworks

4. Tips on doing problem sets

When you first see a problem set, nearly every question may seem difficult. You will eventually adjust and recognize that, for most people, this is a typical starting point. After using whatever resources you have

(notes from lectures, course notes, textbooks, etc) you will get some idea of how to do the problem, but sometimes you will get stuck. Some weeks you will get stuck on several problems and this is both totally natural and expected. The key to success is to start early. The earlier you identify which problems you are getting stuck on , the more time you will have to ensure you get the problem set completed.

Note that it is often helpful to draw a picture, particularly if there is a 3D aspect to the problem. You should also write down the relevant governing equations and any other information you will need (like boundary conditions – don't worry we'll explain this). While working through the solution, do things in a general way first using symbols and wait until you have a final algebraic expression before substituting in any numerical values. Lastly, after you have worked out the solution for each problem, ask yourself, does the answer make sense? Does the answer have the order of magnitude you would have expected? Does it have the right units?

When you write out your final version, make sure to include words and explanation along with the mathematical steps. Leave enough space for the instructors to give you comments and show you where you may have made a mistake. Remember this is not a contest to see who can complete the problem set using the least amount of paper. The final write up for each problem will reinforce your understanding, and the neater presentation will be useful when you go to study for the exams.

5. Working in Groups

You are welcome to work in teams to figure out the solutions, but the goal is to have everyone understand the solutions at an individual level so please ensure that the teamwork doesn't do any of your peers a disservice in this way - because it will hurt them when it comes to exam time. In any case, the homeworks should be written up individually, even if it took help from the entire group to find the solution.

6. Grades

Nominally, about 30% of your grade comes from the midterm and about 60% from the final. The final exam covers all the course though obviously there will be a bias to the last half. Your performance on the problem sheets and in the problem session accounts for the rest of the grade.