EART 111
Mathematics in the Earth Sciences
Fall 2018 Syllabus
Details

**Brief Description** Vectors, 3D geometry, partial differentiation, vector calculus, matrix algebra, differential equations. Emphasis is on practical applications in the Earth Sciences.

**Why do it?** Almost any branch of modern Earth Sciences requires some quantitative skills, and employers’ expectations have risen accordingly. EART 111 is designed to equip you with the skills to cast geological problems in mathematical terms, and to solve them.

**Prerequisites** ES 5,10 or 20 and Maths 11B or 19B.

**Textbooks**
The course does not require a textbook. But if you want to look at some, here are a couple that are useful:


**Webpages** Lecture outlines, suggested problems etc. can be found at http://es.ucsc.edu/~eart111/

**Office Hours and Discussion Sections**
F.N. office hours 1:15-2:15pm Mon and Tues (A219 E&MS) or by appointment (fn-immo@ucsc.edu)

B.D. office hours TBD (bgdowney@ucsc.edu).

Discussion sections 6:00-8:00pm on Weds and 3:30-5:30pm on Thurs (D250)

**Grading**
I grade on a curve, with an approximately B average. The balance of homework and test scores will be roughly 30/70. The pass mark is roughly 50%. One caveat: you must pass the Final to pass the class, because the Final is the only work that I know for sure you (as opposed to someone else) are taking. **If you fail the Final, you fail the class.**

Homework will be posted on the website on Tuesday, and is due in FN’s mailbox by 6pm the following Tuesday. Each extra day that expires results in your score being
reduced by 10%. The only way of avoiding this penalty is if you let me know in advance that your homework is going to be delayed. In calculating your final grade I will discard the lowest problem set grade.

For most problems, you will receive partial credit for a partially-correct answer. You will also get credit for recognizing if an answer you give makes no sense! Some problems will be marked NPC for which you will receive no partial credit. This is to encourage attention to details (e.g. minus signs).

This year I am going to keep track of who attends Discussion Sections. This won’t count towards your final grade, but I want to see if there is a correlation between section attendance and final grade. Discussion sections and office hours are an opportunity for you to get help with concepts that weren’t clear in the lectures. Last year I found that people who attended these meetings did better overall.

**Problem Set and Study Guidelines**

- Each week the first question will generally be a “warm-up”. The other questions are meant to be more challenging, but if you are spending more than an hour per question, you might want to ask for help.
- Don’t wait until the last moment to start your problem set.
- Make your answers legible and organized. Illegible or disorganized answers are unlikely to be marked favourably.
- If you can’t finish a problem, do as much as you can and tell me where you’re headed. I can’t give you partial credit if you don’t give me something to work with.
- Keep track of units. Many errors (up to and including loss of multi-million dollar spacecraft) arise from unit confusion.
- Think about your answer. If it makes no sense, say so; you’ll get some credit for recognizing there’s a problem.
- Working in a group is fine, but don’t just sit on the sidelines and watch, since this can lead to mechanical copying of other people’s work. If I suspect you of plagiarism, I may ask you to duplicate at the blackboard (without notes) what you did in your homework. Make sure that you are able to do this.
- It is unfortunate, but true, that the only way to get better at maths is practice. I have produced a list of suitable practice questions from the two textbooks (see the website).
- Make use of office hours and discussion sections.
- **Ask me in class if there’s something you don’t understand!**