Tectonics (EART-152/207)
Winter Quarter 20120
Course Information and Outline

Tectonics is geology at its most holistic. Aimed at understanding deformation in the Earth's lithosphere, tectonics is a highly integrative involving synthesis of geophysical, geochemical and geological data sets in addition to analog and computational modeling. In this course, you will learn how and why geologists aim to understand the evolution of mountain belts and ocean basins. The latter half of the course will focus heavily on the concepts of continental tectonics in North America with a specific focus on the Central California Coast Ranges.

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Discussion Sections

Lecture
Meeting Time: M, W 1:30 AM – 3:05 PM
Location: E&MS D250

Course Texts
(1) *Global Tectonics, 3rd Edition* (2009), Kearey, Klepeis and Vine
(2) *Plate Tectonics: How it Works (1991),* Cox and Hart
(3) *Geodynamics of the Lithosphere*, *2nd Edition (2007)*, Stuwe.
(4) *Plate Tectonics. An Insider's History of the Modern Theory of the Earth,* Oreskes (ed.)
(5) "The literature"

Amazon and other online retailers list some used versions. You can also purchase or rent a digital version of the book. Check Canvas.

Scientific Computing Software (Required, but free)
(1) MATLAB r2019b
    (a) Curve-fitting toolbox
    (b) Optimization toolbox

(c) Mapping toolbox

MATLAB is site licensed at UC Santa Cruz meaning that it is free to you. Installation instructions can be found at https://its.ucsc.edu/software/matlab.html. In addition to the installation the site has links to tutorials. The entire suite of MATLAB and Simulink software is huge. For this class you only need the toolboxes referenced above.

Course Website

I will post my structure lectures to Canvas. Be mindful that the lectures can be very large, so you will need a fast internet connection to download them. Reviewing my Powerpoint presentations is not an adequate substitute for good note-taking or reading the textbook. If you miss something in lecture raise your hand and ask me to go back. If I write something on the board, it is important! Practice good note-taking. Read the book. Seek help early and often. If you follow these guidelines you will succeed in this class.

Academic Integrity

The UC Santa Cruz Academic Integrity policy can be found here:
https://registrar.ucsc.edu/navigator/section1/academic-integrity.html
For the purposes of this class, your MATLAB code should be your own. It should be well commented and produce the correct answers. Do not copy another student's homework, exams or code. Your term paper should include multiple sources and have sufficient and correct citations.

Grading

Midterm	10%
Final Exam	30%
Homework	40%
Term Paper	15%
Attendance	5%
	100%

Attendance

Class attendance and grades scale directly. I pull from a variety of sources and you can't expect that reading the textbook alone will earn you a solid grade. Therefore I will take attendance this year. There will be a sign-in sheet at the front of the classroom each day. Please email me prior to class if you are unable to attend.

Lateness Policy

Homeworks and reports are due on canvas at the time specified. Your maximum possible score on the lab will be discounted at a rate of 5% per day late The grade is calculated using $G = G_o*(1-0.05*t)$, where t is the number of weekdays late and G_o is your starting actual score. Work

that is more than a week late will not be accepted for credit. Work is to be submitted on Canvas in the corresponding assignment.

Seminar Attendance (Extra Credit)

Attending seminars is a great way to understand what's going on at the cutting edge of our science. I would like to encourage you to go either Whole Earth or IGPP seminars to broaden your exposure to Earth and Planetary Sciences. If you do, submit a two or three sentence summary of the talk and submit on Canvas for **extra credit** up to a partial letter grade (e.g. B → B+). Below are a few suggestions for topics that are germane to this class. I will accept other EPS seminar talks if you cannot attend these.

Whole Earth Seminar (Tuesdays - 3:30 - 4:40 - Nat Sci Annex)

1.21.2020 Damien Saffer, Penn State Recurring and triggered slow slip events near the trench along the Nankai subduction thrust

IGPP Seminar (Fridays, 12 - 1 PM, EMS A340)

1.10.2020 Roland Burgmann, Berkeley Slow Fault Slip
2.14.2020 Camilla Cattania, Stanford
2.28.2020 Jean-Philippe Avouac, Caltech
3.13.2020 Danny Brothers, USGS