SIO 113: Introduction to Computational Earth Science
Spring 2016

Course Description:

Computer models are used in the geosciences to understand complex natural systems. This course includes beginning programming with a user-friendly language (MATLAB) and an introduction to writing computer models of Earth processes.

Prerequisites:

Math 20B and Physics 2A or consent of instructor.

Instructor:	Kerry Key, Associate Professor of Geophysics
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Lectures:	TuTh 9:30a-10:50a	ERCA 117
Section:	Th 11:00a-11:50a	ERCA 117

Textbook:

There is no required textbook for this course. However, the course notes suggest some readings for learning more about MATLAB programming using the textbook:

Basics of MATLAB and Beyond by Andrew Knight, Chapman & Hall/CRC Publishers. Available electronically through the UCSD Library (http://www.crcnetbase.com/isbn/978-0-8493-2039-2). Note that the link only works when you are on the UCSD network. Abbreviation "BMB" in course notes refers to this book.

Course Website:

SIO113 at TritonEd.ucsd.edu *(Check the website often for updates)*

Grading:

Homework (40%); Midterm Exam (30%); Final Project (30%)

Homework Policy:

Homework is due by the beginning of class on the due date. 25% will be taken off for each day it is late. Extensions must be approved by the professor in advance. Working together on homework is encouraged, but you must turn in your own assignments and write your own codes (no cutting and pasting). Homework should be submitted electronically via tritoned.ucsd.edu.

Note about plagiarism:

Plagiarism is not acceptable. As stated above, you must write your own codes. Copying someone else's code and turning it in as your homework is considered plagiarism; you will receive zero credit for that assignment. While all students will be writing codes that do the same thing and hence will create codes that are similar in structure, I expect each student to turn in their own unique implementation.

Schedule:

Note that this is my first time teaching this course. My plan is to largely follow the curriculum and notes introduced by the previous instructor, Darcy Ogden. However, the schedule outlined below is likely to evolve during the quarter so check for updated syllabuses on TritonEd.

Week	Lecture Topics	Application
1	Introduction, getting started with MATLAB and scripts	Getting started
2	Matrices and arrays; plotting	Eruption isopachs
3	Functions; flow control	Diffusion
4	Reading and writing data	Earthquakes
5	***Midterm Exam***	**Midterm**
6	Simple curve fits and interpolation	Keeling curve
7	Steady state models and matrix solution	Groundwater flow
8	Time dependent models 1 - mass balance	Glacier growth
9	Time dependent models 2 – momentum conservation	Orbital dynamics
10	Final Project	Self chosen