MODELING MARINE SYSTEMS
MARS 8510

General Course Information:

Instructor:	Dr. Adrian Burd, Marine Sciences Room 110 K (adrianb@uga.edu)	
Office Hours:	By appointment (please email, call, or drop by the office)	
Class Times:	Tuesday, Thursday 12:30 - 1:45, Marine Sciences Room 208	
Readings:	Notes will be posted on the class ELC website. Additional readings will be assigned (and also posted on the ELC website) as needed.	
Textbook:	*Modeling Methods for Marine Science. David Glover, William Jenkins & Scott Doney (Cambridge University Press, 2011)*	
Grades:	Class Project	50%
	Homeworks & in-class participation	50%

Like many geosciences, marine science has a growing tradition of modeling. Mathematical and computer models are tools that serve many purposes

- They act as a tool to synthesize current understanding of a system from which quantitative predictions can be made to test that understanding against observation and experiment.
- Models are tools that can help generate new hypotheses about a system, again providing quantitative predictions that can be tested against data.

The art of the modeler lies in being to able to analyze a problem and determine which of the myriad processes that are operating are actually important. From there, the modeler has to develop mathematical and/or computational models of the system.

This course aims to introduce some of the basic analytical and computational skills and techniques needed for modeling marine (and other geoscience) systems. These will include (but not be restricted to): developing mathematical descriptions of ocean-based processes; analytical and numerical evaluations of integrals and solutions of differential equations; best practices for maintaining, documenting, and archiving computer code.

Modeling is not a “spectator sport” and the only way to learn this material is by using it; it cannot be learned simply by reading and memorizing. The course will be arranged largely around a series of small projects based on papers from the oceanographic literature. We will work on these small projects in class and through homeworks with a combinations of hands-on work, lectures and reading. By working through these small projects we will cover a wide variety of topics including differential equations, numerical methods, computer programming, as well as examining some best-practices.

There will be no exam in the course, but students will be required to develop and present results from a project. This is a substantial (50%) part of the grade and the work you do in this project has to reflect this. Details about project topics and formats will be handed out in class.

Week	Topic
Week 1	Course introduction and preliminaries
Week 2	Class Project 1: Simple Box Models in the Oceans
Week 3	Class Project 1 continued
Week 4	Class Project 1 continued
Week 5	Class Project 2: An ecosystem model
Week 6	Class Project 2 continued
Week 7	Class Project 2 continued
Week 8	Class Project 2 continued: Student Project proposals due.
Week 9	Class Project 3: Dealing with both Space and Time
Week 10	NO CLASS (Spring Break)
Week 11	Class Project 3 continued
Week 12	Class Project 3 continued
Week 13	Class Project 4: Hydrodynamic models
Week 14	Class Project 4 continued
Week 15	Class Project 4 continued
Week 16	Class Project 4 continued & Student Project
Week 17	Student Project Presentations
Week 18	Student Project Presentations

Academic Honesty:

All academic work must meet the standards contained in "A Culture of Honesty". Students are responsible for informing themselves about those standards before performing any academic work. The UGA Academic Honesty Policy (A Culture of Honesty) is available on-line at:

http://www.uga.ed/honesty/ahpd/culture_honesty.htm .

Students With Disabilities:
Students with disabilities who require reasonable accommodations in order to participate in course activities or meet course requirements should contact Dr. Burd.

Course Withdrawls:
Students withdrawing from the course before the midpoint of the semester will be assigned a grade of 'WP' or 'WF', depending on their performance in the class up until the time that the drop is initiated. For withdrawls after the semester midpoint, University policy requires that a grade of 'WF' be assigned, except in those cases in which the student is doing satisfactory work and the withdrawal is necessitated by ill health or other hardship, as certified by the Office of the Vice President for Student Affairs. Students wishing to withdraw from the course after the midpoint of the semester under these circumstances should contact the office of the Vice President for Student Affairs (542-3564).

Syllabus Disclaimer:
This course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.