Syllabus

Environmental Modeling

PHC 7935.003(crn# 22663)
CNG 6933.907 (crn# 21237)

Spring 2012

Course Description:	This course will provide a doctoral-level introduction to environmental fate and transport modeling with applications primarily to air pollution modeling.
Pre-Requisites:	College-level multi-variable calculus, differential equations, linear algebra, and statistics. College-level chemistry, physics, and biology. Upper level graduate status (students who have completed at least one year of graduate work toward a MS or PhD degree). This course is intended for students who will be using mass-balance-based computational modeling for their thesis or dissertation research.
Credit Hours:	3 units
Dates and Times:	Tuesdays, 3:05 – 5:50 pm. January 10 – April 24
Location:	COPH, Room 2022
Delivery Format:	Face-to-face classroom instruction.

Instructor Information:

Instructor Name:	Amy Stuart, PhD
Office location:	CPH 1117
Contact information:	Email: astuart@hsc.usf.edu Phone: 974-6632
Student Help Office Hours:	Friday afternoons, by appointment, in CPH 1117. I will also be holding student office hours for my undergraduate class at the USF Library on M and W from 4:30 - 5:30 pm. You are also welcome to drop in on those help hours.
Preferred method of contact:	My preferred method of contact is face-to-face during class, scheduled appointments, or the drop-in office hours listed above. Appointments may be made during class or via email (please make requests at least one full day ahead of the requested time). Unfortunately, due to the volume of email that I receive and the inefficiency of the medium for interactive teaching, I cannot reply to requests for detailed information or help over email.

Reading Materials:

Required

Integrated Environmental Modeling, by A. Ramaswami et al, John Wiley & Sons, 2005. (Available at the HSC and USF bookstores).
Students should plan to bring this textbook to class each week.

Supplemental (On course reserve at the USF main library)

Environmental Modeling, by J. Schnoor, John Wiley & Sons, New York, 1996.
Fundamentals of Atmospheric Modeling, by M.Z. Jacobson, Cambridge University Press, 2005.

Other reading materials may also be used, as needed.

Course Outline:
(Tentative)

We will primarily be working through the required course textbook chapters. Hence, the content covered, and order, will be:

Chapters refer to the course textbook (unless otherwise indicated)

Introduction to environmental modeling (Chapter 1)
Pollutant properties, behavior, and reactivity (Chapter 2)
Interphase transfer (Chapters 3 and 4)
Transport fundamentals (Chapter 5)
Numerical Methods for solution of ordinary and partial differential equations (Chapter 6)
Probabilistic Methods for modeling (Chapter 7)
Model Evaluation, Analysis, and Optimization (Chapter 14)
Atmospheric chemical transport modeling (Chapter 8)
Atmospheric chemical transport and transformation modeling (Chapter 11)
Overview of modeling of other media (Chapters 9 & 10)
Exposure and risk assessment modeling (Chapter 13)

Student project presentations on April 24
Final Project Reports due May 1 at 5 pm

Learning Objectives:

Upon completion of this course the student should be able to:

1) Discuss and use basic principles of environmental contaminant fate and transport modeling.
2) Analyze the physical, chemical, biological and numerical theory underlying environmental models.
3) Develop mass-balance-based mathematical and numerical models of contaminant fate across multiple media.
4) Apply an environmental model to evaluate pollutant interactions with the environment and human health.
5) Apply tools and data appropriately for model evaluation.
6) Present and report on the analysis, (development), application, testing, and evaluation of an environmental fate and transport model.

Assessments:

1. Project report and presentation: Each student will develop (or analyze), apply, and evaluate a numerical model to an environmental problem of interest. (An available model may be used for the project, but the student will then explore and analyze the theoretical basis and assumptions of the model, in lieu of model development). Students will prepare a 20-page report and give a presentation on their project at the end of the term.

2. Class participation: As a doctoral seminar, there is a large class participation and discussion component to this class. Students will be regularly expected to read material for the class and *present on that material* as well as present regularly (weekly) on solutions to assignment problems (see below).

3. Practice and Project Development Assignments: There will be regular assignments over the course of the semester. After the first month, most of the assignments will be geared toward making progress on the course project. Assignments are primarily for self assessment and will be checked off (only) on the due date, if completed. Exceptions will be the paper draft and peer-review, which will be submitted to a peer (after check-off) to enable the goals of these assignments.

Public Health Competencies: (That are developed through this course.)	Objectives	Assessments
Environmental Health MSPH Competencies		
Develop data analyses and interpretation skills, to answer a research hypothesis	1-6	1-3
Describe the validity and significance of research results;	5	1
Communicate orally and in writing research implications, methods, results, and conclusions	1,6	1,2
Demonstrate appropriate research ethics in data management and publication of results	5,6	1
Environmental Health PhD Competencies		
Interpret literature regarding environmental health and understand the limitations and strengths of the research presented	6	1-3
Conduct discipline-specific literature reviews to assess current issues and develop research questions	6	1
Demonstrate special knowledge in a specific area of interest in environmental health	1-6	1-3
Formulate substantive research questions in environmental health	6	1
Design and execute a feasible research plan to address gaps in the state of knowledge in environmental health	2-6	1
Communicate effectively with other scientists and the public	1,6	1,3

Grading and Course Policies:

Grading Scale:

Project report:	40%
Project presentation:	20%
Class participation:	25%
Practice and Project Dev. Assignments:	15%

The course will be graded on a curve, with natural divisions in the earned scores leading to divisions in the letter grades. + and – grades will be used in this course.

Late and Make-up Policies: Students are expected to present and submit assessments on time, and to be present to participate in the class. If you know that you cannot be present for the date of the student project presentations, please inform me of the conflict by the second class meeting. For other class dates, I would appreciate being informed as soon as possible, so that I can plan the class appropriately. If you miss a class unexpectedly (e.g., due to sickness), please contact a fellow student to get notes or announcements of assignments.

Electronic Equipment Usage: Electronic equipment, including student computers, cell phones, personal digital assistants, etc. must be turned off prior to entering the classroom, unless specifically designated for use during class by the instructor. This equipment is disruptive to the class and distracting to students and the instructor.

Permission to Use Lectures and Course Materials. Lectures may not be recorded without prior permission of the instructor. All unauthorized recordings of class are prohibited. Recordings that accommodate individual student needs must be approved in advance and may be used for personal use during the semester only; redistribution is prohibited.

INSTITUTIONAL POLICIES	
Student Handbook:	http://www.sa.usf.edu/dean/docs/full handbook.pdf
Student Conduct:	USF Student Rights/Responsibilities: http://www.sa.usf.edu/srr/page.asp?id=81 USF Student Code of Conduct: http://www.sa.usf.edu/srr/page.asp?id=88
Disruption of Academic Process/Academic Integrity of Students:	Disruption of the academic process and violations of the policies regarding academic integrity will not be tolerated. Review USF policies on Disruption of the Academic Process and the Academic Integrity of Students at: http://generalcounsel.usf.edu/regulations/pdfs/regulation-usf3.025.pdf
Academic Dishonesty/ Plagiarism:	Plagiarism will not be tolerated and is grounds for failure. Review USF Academic Dishonesty and Disruption of Academic Process Policy at: http://www.grad.usf.edu/inc/linked-files/USF_Grad_Catalog_2011-2012.pdf#page=39 The University of South Florida has an account with an automated plagiarism detection service (*SafeAssign*), which allows instructors and students to submit student assignments to be checked for plagiarism. I (the instructor) reserve the right to 1) request that assignments be submitted as electronic files and 2) submit students' assignments to *SafeAssign*, or 3) request students to submit their assignments to *SafeAssign* through myUSF. Assignments are compared automatically with a database of journal articles, web articles, the internet and previously submitted papers. The instructor receives a report showing exactly how a student's paper was plagiarized. **NOTE:** An institution may not release a paper to a plagiarism detection software without the student's prior consent unless all personally identifiable information has been removed, such as a student's name, social security number, student number, etc.. Note that a paper/essay is considered an educational record and an institution may not ask a student to waive their rights under FERPA for the purpose of submitting papers to a plagiarism detection software. For more information about Plagiarism and *SafeAssign*, visit: Plagiarism tutorial: http://www.cte.usf.edu/plagiarism/plag.html *SafeAssign*: http://media.c21te.usf.edu/pdf/student/bbstud_subsafeassgn.pdf

Cheating Statement:	The USF College of Public Health expects students to maintain academic honesty in all courses. By virtue of being registered in an public health course, students agree to refrain from cheating. If cheating in any form (academic dishonesty) is detected, appropriate action will be taken. (Refer to USF Academic Dishonesty Policy). http://www.grad.usf.edu/inc/linked-files/USF_Grad_Catalog_2011-2012.pdf#page=39
Undergraduate Academic Policies and Procedures:	http://www.ugs.usf.edu/pdf/cat1112/08acapol.pdf
Special Accommodations:	Students in need of academic accommodations for a disability may consult with the office of Services for Students with Disabilities to arrange appropriate accommodations. Students are required to give reasonable notice (typically 5 working days) prior to requesting an accommodation.

	Students with Disabilities Services: http://www.sds.usf.edu/ Students: http://www.sds.usf.edu/students.asp Faculty: http://www.sds.usf.edu/faculty.asp
Holidays and Religious Observances:	http://generalcounsel.usf.edu/policies-and-procedures/pdfs/policy-10-045.pdf
Emergency Preparedness:	In the event of an emergency, it may be necessary for USF to suspend normal operations. During this time, USF may opt to continue delivery of instruction through methods that include but are not limited to: Blackboard, Elluminate, Skype, and email messaging and/or an alternate schedule. It's the responsibility of the student to monitor Blackboard site for each class for course specific communication, and the main USF, College, and department websites, emails, and MoBull messages for important general information.
Student Grievance Procedure:	Review USF Academic Grievance Policy at: http://generalcounsel.usf.edu/policies-and-procedures/pdfs/policy-10-002.pdf http://www.grad.usf.edu/inc/linked-files/USF_Grad_Catalog_2011-2012.pdf#page=48 Student assistance is provided by Division of Student Affairs, Office of the Student Ombudsman. http://www.sa.usf.edu/ombudsman
RESOURCES FOR STUDENTS	
Library Resources:	USF Library Resources and Services: http://www.lib.usf.edu/ Shimberg Health Sciences Library: http://library.hsc.usf.edu/ Shimberg Health Sciences Library Tutorials: http://library.hsc.usf.edu/ (follow links under 'Instructional Services' section)
Creating Citations & Using Refworks:	http://guides.lib.usf.edu/CitingSources
Plagiarism & Safe Assign:	See Academic Dishonesty/Plagiarism Section
USF Email Accounts:	http://health.usf.edu/publichealth/eta/pdf/MyUSF_Email.pdf
Blackboard Tutorials:	http://media.c21te.usf.edu/bbstudents.html