

AMATH 383  
Introduction to Continuous Modeling  
Summer 2007

Time: MWF 12:00 - 1:00  
Loew 102

Website: <http://www.amath.washington.edu/courses/383-summer-2007/>

User Name: amath383

Password: Please email me for the password. The password is in the printed syllabus that was handed out in class

Instructor: Katie Oliveras

TA: TBA

Email: [oliveras@amath.washington.edu](mailto:oliveras@amath.washington.edu)

Office: Condon Hall 810A

Office Hours: Mon and Fri 1:30 - 2:30 Condon Hall 810A (and by appointment)

## Course Description

This course is an introductory survey of applied mathematics with emphasis on modeling of physical and biological problems in terms of differential equations. We will discuss formulation of the problem, derivation of the solution, and interpretation of the results.

Prerequisites: AMATH 351, MATH 307, or equivalent.

## Textbook

We will be using *Topics in Mathematical Modeling* by K.K. Tung (List Price \$45.00). You can find it at the University Bookstore or at various online dealers.

## Course Outline

Below is a list of the topics and chapters in the book that we will cover. Lecture notes, and handouts can be found on the website as necessary.

- Review of AMATH 351 (June 18)
- Chapter 4 - Differential Equation Models - (2 lectures)
- Chapter 5 - Modeling in the Physical Sciences (2 lectures)
- Chapter 6 - Nonlinear Population Models (2 lectures)
- Additional Reference - Bifurcation Theory - Advanced Ideas in Nonlinear Stability (2 lectures)
- Chapter 9 - Interactions, Predator-Prey Models (2 lectures)
- Chapter 10 - Marriage and Divorce (2 lectures)
- Chapter 11 - Chaos in Deterministic Continuous Systems (2 lectures)

## Grading

There will be no exams (for better or worse, but mostly for better). Your grade will be composed of 6 homework assignments (each counting for 10% of your final grade), and a term paper (counting for the remaining 40%).

Please note, that if you would like to receive a **W** (writing) credit, please indicate so on your term paper, and turn in a draft on the day specified. It will be read, and returned to you for corrections. *University regulations requires the W credit paper 10-15 pages long (not including figures or bibliography).* More information about the University's writing credit can be found at

*<http://www.washington.edu/students/ugrad/advising/ged/gedw.html>*

## Homework

Homework sets will be assigned according to the schedule posted on the website. Homework is due at the beginning of class on its due date. **Late homework is not accepted unless you have prior approval from me.** Every homework that you turn in should include a header with your name, student number, due date, course, and the homework number as a title. You are expected to turn in homework that is neat, and readable. **The grader is instructed to deduct points for messiness.** If you are concerned about your homework presentation, please use a computer aided software package to type your solutions (word, open office, latex, etc).

## Term Paper

A major feature of this introductory mathematical modeling course is that students develop course projects and write term papers on those projects. These term papers are to be turned in on the last day of lectures. For guidelines as well as possible topics, please see the course website.

Table 1: Term Paper Time Line

June 29, 2007	Project Proposals
July 11, 2007	Project Proposal Outline
July 27, 2007	Outline + Summery
August 13, 2007	Draft Due for W credit
August 17, 2007	Final Paper Due

## Computer Usage

The use of computer software such as Matlab, Maple, Mathematica, etc. might be useful in gaining intuition into systems that we will be examining. All of these programs are available in the Math Sciences Computing Center located in the basement of the Communications Building in Room B-022. Hours are M-F 8:30 - 5:00. *Software is also available for purchase from the University Bookstore at student prices.*

## Reference Books

Please check on the course website for additional references that will be of use during the quarter.