

AMATH 383
Introduction to Continuous Modeling
Autumn 2007

Time: MWF 10:30 - 11:20
Guggenheim 416

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

The user name and password is on the copy of the syllabus handed out in class. Email me if you need it.

Instructor: Katie Oliveras

Email: oliveras@amath.washington.edu

Office Hours: (Posted to Course Website)

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 general outline of the topics that we will cover in class. Lecture notes, and handouts can be found on the website as necessary.

- Review of Ordinary Differential Equations
- Building a Mathematical Model
- Scaling Laws and Dimensional Analysis (tentative)
- 1-D Models (Exponential, Population, and Physical models)
- 2-D Models (Predator-Prey, Competition/Cooperation, and Conflict Models)
- 3-D and higher Models
- Partial Differential Equations

Grading

There will be no exams (for better or worse, but mostly for better). Your grade will be composed of 8 homework assignments (counting for 70% of your final), and a final term paper (counting for the remaining 30%).

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 during the final examination week. A running list of suggested topics can be found on the course website.

This course is listed as an optional W (writing) credit class. If you would like to receive a W credit, please indicate so on all of your assignments relating to your term paper. 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 Universitys writing credit can be found at

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

Table 1: Term Paper Time Line (more info on website)

October 10, 2007	3 Project Topic Proposals
October 24, 2007	Final Project Proposal + Rough Outline
November 16, 2007	Final Outline + Description of Mathematical Model
November 26, 2007	Rough Draft Due
December 10, 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. Software is also available for purchase from the University Bookstore at Student prices.