

**AMATH 383**  
**Introduction to Continuous Modeling**  
**Winter 2008**

**Time: MWF 12:30 - 1:20**  
**Mary Gates Hall 251**

Website: <http://www.amath.washington.edu/courses/383-winter-2008/>  
See course message board for user name and password  
("Welcome" post under Announcements)

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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.

## Message Board

Instead of sending tons of emails throughout the quarter, I will post all announcements, homework hints, and any other information to the course message board. Using your UWNNetID, you can log in to read posts, as well as post your own questions and answer fellow students questions (if you like). Additionally, you can set up notifications so that you don't miss a new posting. A link to the message board can be found on the course website.

## 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 assignments are due at the beginning of class on the due date, and will generally be returned in class one week later. There are no exceptions for late homework. Your lowest homework score will be dropped.

Every assignment that you turn in should include a header with your name, student number, due date, course, and the homework number as a title. The grader is instructed to deduct points for messiness. If you are concerned about the neatness of your homework, you may use any typesetting program that you like. There are several options mentioned in computer usage.

## 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. Guidelines for the final project 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 University's writing credit can be found at

<http://www.washington.edu/students/ugrad/advising/aif/wcourse.html#criteria>

## 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. Additionally, when you type up your final report, you will need some special tools for entering in your equations, and formulas. All of these programs are available in the Math Sciences Computing Center located in the basement of the Communications Building in Room B-022.

Some software is also available for free or reduced prices at <http://www.washington.edu/uware>