AMATH 383, Summer 2017
MWF 12:00 - 1:00, JHN 075
University of Washington

Instructor:
Lowell Thompson
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Office Hours:
Lewis 128
W 1:30-2:30, Th 3:00-4:00

Course Description

This is an introductory survey of applied mathematics with an emphasis on the modeling of physical and biological problems in terms of differential and difference equations. We will cover three distinct but equally important components of a mathematical modeling project: Formulation of a model; solution methods; and interpretation of results.

Course Information

All of the information for this course is available at http://www.lowellfthompson.com/courses/amath383sum2017.

We will loosely follow the textbook *Topics in Mathematical Modeling*, by K.K. Tung. You are by no means required to purchase this text, but if you want an alternative source of explanations, it is a good place to start.

The prerequisites for this course are either AMATH 351, MATH 136 or MATH 307 (or their equivalents). You will be expected to be proficient in algebra, differentiation, integration and basic methods of solving ordinary differential equations. Any other necessary skills will be taught in the class.

Grades

Homework: 50% There will be six homework assignments throughout the quarter. Each assignment will be due on Friday at the beginning of class (12:00) unless otherwise stated.

Term Paper Proposal: 10% The proposal for your term paper will be due on Friday, July 28.

Term Paper: 40% The completed term paper will be due on the last day of class – Friday, August 18.

Homework Policy

No late homework will be accepted. Solutions will be posted on the day the homework is due. You are encouraged to work with other students on these assignments, but each student must write up their own solution. In addition, the presentation of your homework will be reflected in your score, so make sure that it is neat and readable and has your name and the assignment number at the top. While you are not required to type these solutions, you will need to type your term paper and proposal, so if you are not familiar with a typesetting system such as LATEX, you may wish to begin learning now.

Term Paper

There will be no exams in this course. Instead, you will need to develop a course project and write a term paper on that project. Please carefully read the guidelines for this project, written by Professor K.K. Tung, a former chair of this department, at http://www.lowellfthompson.com/courses/amath383sum2017/guidelines.pdf. We will be following these guidelines with one exception: Since this is a relatively small class, the maximum group size will be two students.

A list of potential topics will be provided. You are welcome to use a different topic if you find one that interests you, but you should discuss it with me first. In either case, you will need to write a two page proposal describing the following:

1. What real world problem are you going to model?

2. What work have other researchers done on this problem already?

3. What simplifications will you need to make in order for this problem to be tractable?

4. What mathematical methods will you be employing?

You should also include a bibliography for for any other works that you have referenced.