

Professor: Dr. Talitha M. Washington

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Office hours: Mon 9-10, 12-1; Tue 9-11; Wed 9-10; Thu 9-10; Fri 9-1

Required Texts: *Topics in Mathematical Modeling*, by K. K. Tung, heavily supplemented with other materials from books, journals, and the internet

Prerequisite: Math 222, at least one computer programming class, and senior standing

Course Website: <http://acebb.evansville.edu>

Course Description: Focuses on the formulation, analysis and interpretation of mathematical models related to contemporary problems drawn from the natural sciences, social sciences and management science. Involves team projects and a seminar format.

Course Overview: Often, analyzing complex situations (like the weather, a traffic flow pattern, or an ecological system) is necessary to predict the effect of some action. This course seeks to provide experience in the process of using mathematics to model real-life situations. The first half examines and critiques specific examples of the modeling process from various fields. During the second half, teams of students create, evaluate, refine, and present a mathematical model from a field of their own choosing.

Objectives/Goals

- ❖ Learn how to create and develop a mathematical description of physical events and situations
- ❖ Gain experience in open ended problems, individually and in teams
- ❖ Learn fundamental principals of mathematical modeling
- ❖ Further develop and refine mathematical writing skills
- ❖ Gain experience in developing and presenting mathematical talks
- ❖ Learn where and how to find research materials for mathematics
- ❖ Gain an overview of mathematics courses

Grading

Active participation – 15%

Homework – 25%

Journal Article Review – 10%

Project Proposal – 5%

In-class Progress Report – 5%

Presentation Slides Rough Draft – 5%

Final Presentation – 10%

Written Rough Draft – 5%

Final Written Project – 20%

Major Topics

The Modeling Process

Continuous Models

Discrete Models

Fitting and Testing Models

Student Research and Presentations

Presentations in General: Presentations will be graded with these criteria: (1) effectiveness of your presentation, (2) inclusion of appropriate content and supplemental material, and (3) effective oral presentation (talk, explanation and “tell the story”).

Final Project: The final project will involve applications of mathematics and the topic must be chosen by each project team and approved by the instructor. Project teams of ~3 students will be formed at the beginning of the semester and will remain together for the remainder of the semester. Each project team is expected to meet regularly and each member is expected to contribute to the preparation and presentation of the projects. Guidelines for project reports and presentations will be given out at a later date.

Journal Article Review: Students will work with their project team to find an article from a mathematics journal that addresses the topic chosen for the final project. The group will present the findings of this article to the class using PowerPoint. Each group will submit a written review of their article.

Major Field Test: In November, students will take the two-hour Major Field Test. This is an assessment tool for the mathematics department and results are confidential. You will not receive a grade for this test but you will be penalized if you do not complete the test at the designated time (counts toward active participation). Please let me know if you have any questions or concerns.

Homework: The homework will emphasize topics and techniques discussed in class or the text. The homework will be announced several days before they are due and they must be turned in at the beginning of the class period on the due date. **Late work will not be accepted.**

Active Participation: Contribution to classroom discussion, team projects, attendance and completion of the Major Field Test.

Honor Code: It is expected that you are familiar with and will comply with the terms of the University's Academic Honor Code. Giving or receiving any type of aid on exams or quizzes is strictly prohibited, and will result in an F. Collaboration (but not direct copying) on homework is allowed and even encouraged.

Accessibility: Please let me know immediately if you have a learning or physical disability requiring accommodation. For more information, contact the Office of Counseling and Health Education at 488-2663.

Have a great semester!!