
Instructor:	Talitha Washington
Contact Info:	Office: KC 318; Phone: 488-2213; Email: tw65@evansville.edu
Office Hours:	MWF 10-12, 1-2; T 8-9
Required Texts:	<i>A First Course in Mathematical Modeling</i> , 3 rd ed. by Giordano and Weir, heavily supplemented with other materials from books, journals, and the internet
Prerequisite:	Math 222, at least one computer programming class, and senior standing

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

- ❖ To gain an appreciation of a wide variety of mathematical applications
- ❖ To gain experience at attacking open ended problems, individually and in teams
- ❖ To learn new mathematical topics relevant to the modeling process
- ❖ To construct, analyze, and interpret mathematical models in the natural sciences, social sciences, and management science
- ❖ To gain an overview of mathematics courses taken

Grading

Active participation – 15%
In-class Math Overview – 10%
Homework (4 @ 5% each) – 20%
Journal Article Presentation – 10%
Project Proposal – 5%
In-class Progress Report – 5%
Written Rough Draft – 10%
Final Written Project – 10%
Presentation Slides Rough Draft – 5%
Final Presentation – 10%

Major Topics

The Modeling Process; Difference Equations and Systems of Difference Equations; Dynamical Systems (1.1-1.4)
Proportionality and Geometric Similarity (2.1-2.3)
Qualitative Modeling with Functions – data fitting (3.1-3.4, 4.1-4.4)
Models of uncertainty – probability and simulation (5.1-5.3, 6.1-6.3)
Models of change – differential equations (10.1, 10.2, 10.4, 10.5, 11.1-11.5)
Overview of Mathematics
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 3-4 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: 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.

Math Overview: Students will work with a team on a math course or courses that they have taken and will present key topics, ideas and theorems to the class.

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 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!!

Schedule

Week	Monday	Wednesday	Friday
1		8/29/07 Intro, Course Overview	8/31/07 1.1, 1.2
2	9/3/07 1.3, 1.4	9/5/07 2.1, 2.2	9/7/07 2.3, 3.1
3	9/10/07 3.2, 3.3	9/12/07 3.4, HW 1 Due	9/14/07 4.1, 4.2
4	9/17/07 4.3, 4.4	9/19/07 5.1, 5.2	9/21/07 Group Work, HW 2 Due
5	9/24/07 5.3, 6.1	9/26/07 6.2, 6.3	9/28/07 Group Work
6	10/1/07 Group Work, HW 3 Due	10/3/07 Journal Articles	10/5/07 Journal Articles
7	10/8/07 10.1, 10.2	10/10/07 10.4, 10.5	10/12/07 11.1, Proposal Due
8	10/15/07 Fall Break	10/17/07 Adrian Gentle	10/19/07 11.2, 11.3
9	10/22/07 11.4, 11.5	10/24/07 Group Work	10/26/07 Group Work, HW 4 Due
10	10/29/07 Math Overview Presentations	10/31/07 Math Overview Presentations	11/2/07 Group Work
11	11/5/07 Group Work	11/7/07 Extra	11/9/07 Progress Report
12	11/12/07 Progress Report	11/14/07 Group Work	11/16/07 Major Field Test*
13	11/19/07 Class Optional*	11/21/07 Thanksgiving Break	11/23/07 Thanksgiving Break
14	11/26/07 Group Work	11/28/07 Rough Draft Due	11/30/07 Group Work
15	12/3/07 Group Work	12/5/07 Group Work, Slides Draft Due	12/7/07 Group Work
16	12/10/07 Group Work	12/12/06	?

Please note that this schedule may vary according to our progress in class.

*The major field test is a two hour test given; thus we will have an optional class on 11/19/07.