

Instructor: Talitha Washington
Contact Info: Office: KC 318; Phone: 488-2213; Email: tw65@evansville.edu
Office Hours: MF 8-9, 10-12; T 8-11; W 8-9;
Required Texts: *A First Course in Mathematical Modeling*, 3rd 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.

Seminar Format: Students will be expected to present selected sections to the class as well as read selected topics, complete assigned problems, and contribute to classroom discussion on these topics. When necessary, the instructor will provide information relating to the underlying principles and techniques of mathematical modeling. In addition, each student will be expected to participate in two team projects. These projects will involve background investigation, a written report, and a presentation to the class.

Objectives/Goals

- ❖ To gain an appreciation of the wide variety of relevant 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

Major Topics

1. The Modeling Process; Difference Equations and Systems of Difference Equations; Dynamical Systems
2. Proportionality and Geometric Similarity
3. Qualitative Modeling with Functions – data fitting
4. Models of uncertainty – probability and simulation
5. Models of change – differential equations
6. Student research and presentations

Grading

Active participation throughout the process – 15%
Chapter Presentation – 10%
Journal Article – 5%
Exams – 25%
Homework – 15%
Final Project – 15%
Final Presentation – 15%

Chapter Presentations: You will assume responsibility for one seminar meeting to present selected sections in Giordano and Weir. Presentations will be graded with these criteria: (1) effectiveness of your presentation, (2) inclusion of appropriate content and supplemental material, (3) effective oral presentation (talk, explain things and “tell the story”), and (4) worthwhile utilization of the class time.

Final Project: The final project will involve applications of mathematics and the topic must be chosen by each team and approved by the instructor. Teams will be formed during the first week of the semester and will remain

together for the remainder of the semester. Each 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 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.

Exams & Quizzes: The exams and homework will emphasize topics and techniques discussed in class or the text. Make-up exams will be considered only for university excused absences and documented medical emergencies, but only if I have been contacted before the exam. Graded homework problems 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 and attendance

Your Reward: The Senior Seminar is meant to be an integrative experience for you by combining your mathematical knowledge with a personal interest. The paper will enhance your writing skills as well as your mathematical skills. For many students, the presentations are a new experience, requiring mastery of the subject matter, technical control over the mode of presentation, and public speaking skills. You should find your semester-long experience challenging while at the same time fun and worthwhile.

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.

Schedule

Week	Monday	Wednesday	Friday
1		8/23/06 Intro, Resume	8/25/06 Careers in Math
2	8/28/06 1.1, 1.2	8/30/06 1.3, 1.4	9/1/06 2.1, 2.2
3	9/4/06 2.3, 2.4, 2.5	9/6/06 3.1, 3.2	9/8/06 3.3, 3.4
4	9/11/06 Extra	9/13/06 Review	9/15/06 Exam 1, Ch. 1-3
5	9/18/06 Donut Day – Ramers	9/20/06 4.1, 4.2	9/22/06 4.3, 4.4
6	9/25/06 Journal Articles	9/27/06 Journal Articles	9/29/06 Proposal/Outline Due
7	10/2/06 5.1, 5.2	10/4/06 5.3, 5.4	10/6/06 6.1, 6.2
8	10/9/06 Fall Break	10/11/06 Fall Break	10/13/06 6.3
9	10/16/06 Extra	10/18/06 Review	10/20/06 Exam 2, Ch. 4-6
10	10/23/06 8.1, 8.2	10/25/06 8.3, 8.4	10/27/06 10.1, 10.2
11	10/30/06 10.3, 10.4	11/1/06 Extra	11/3/06 Group Work
12	11/6/06 Writing Center Deadline	11/9/06 Group Work	11/10/06 Donut Day
13	11/13/06 Rough Draft Due	11/15/06 PowerPoint	11/17/06 Group Work
14	11/20/06 Donut Day	11/22/06 Thanksgiving Break	11/24/06 Thanksgiving Break
15	11/27/06 Slides Due	11/29/06 Presentations	12/1/06 Presentations
16	12/4/06 Presentations	12/6/06	?

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