SYLLABUS

• TEXT

• PREREQUISITES
  Math 106, 107, and 208. You are expected to know differentiation and integration techniques and to be familiar with vector fields and parameterized curves.

• COMPUTER LAB
  Some work in Math 221H will require the use of a computer algebra system. All students enrolled in the course may obtain access to Maple, as well as email and the internet, at the Math Department Computer Lab (Avery 18). Students who obtain a lab account are expected to attend a lab orientation session. Students who have not used Maple are encouraged to work through the department’s Maple tutorials at the appropriate point in the course. These are available at my home page.

• DAILY WORK
  The text includes Instant Exercises in most sections; these are to be done BEFORE the day on which that section will be discussed in class. There will be a daily assignment of exercises to be done for practice. There will also be some assignments to be done for credit. The calendar of topics, exercises, and assignments for credit will be posted on the course web page http://www.math.unl.edu/gledder/Math221H/. Updates will be posted after our Thursday class each week.

• FINAL EXAM
  All Math 221H students are required to take a comprehensive final examination, which will be in our regular classroom from 10:00 a.m. to noon on Monday, December 13. You must arrange your personal and work schedules to allow you to take the exam at this scheduled time. Students with conflicting exam schedules, defined as three or more exams on December 13, will be permitted to take an alternate final exam AFTER the regularly scheduled exam.

EXPECTATIONS FOR AN HONORS COURSE

College courses are primarily about learning, not credits or grades. Course credits provide recognition of learning and course grades provide a rough measure of the amount of learning. Your tuition for a college course buys instructor expertise, not course credit. It is up to you to make the most of the opportunity you have purchased. These statements are true for all college courses, but they are particularly worthy of emphasis in an honors course. This course is intended for students who want to learn more than what they would be able to learn in a regular section of Math 221. We will do slightly more material than Math 221, and we will do some harder homework problems. If your motivation for registering for the course does not include a desire for increased learning, then you would be better served by transferring to Math 221.

I make a serious effort to make class time a valuable learning experience. I therefore consider regular attendance to be the first commitment a student needs to make in a course. This is all the more true for a class that meets only twice each week. To get the most out of class, commit yourself to coming each day, ready to learn the scheduled topic. This means doing homework promptly and reading the appropriate section before class. The amount of time you need to spend outside of class will depend strongly on your background. Well-prepared students should expect to spend about 6 hours per week outside of class. There may be weeks when more time is necessary. Don’t overestimate your current knowledge and skills. Don’t underestimate your potential either.
OVERVIEW

As I conceive it, this course is really about mathematical modeling. A lot of our attention will be devoted to constructing, analyzing, and improving mathematical models. Because this is a differential equations course, our models will be concerned with situations governed by scientific laws that relate rates of change of quantities to functions of those quantities. This is not a severe restriction, because differential equations are appropriate modeling tools for many areas in the physical sciences and some areas in the life sciences as well. Over the course of the semester, we'll spend most of our time studying differential equations and their solutions, but we will generally do this in the context of specific mathematical models.

In order, we will study most of Chapters 1, 2, 3, 5, 6, 4, 7, and a portion of Chapter 8. We will probably also work on two or three of the Case Studies.

You will notice that each section of the textbook is organized around a Model Problem. Some sections have introductory material that precedes the Model Problem, and most have some material that follows the study of the Model Problem. I suggest that you prepare for class by reading the appropriate section(s) up to and including the study of the Model Problem, and doing the Instant Exercises as you read.

GRADES

Your grade will be determined by the sum of your scores on the various evaluations used in the course. Exam grading scales will be determined after the exam has been graded; other assignments will be graded as A+: 95–100, A: 90–94, A-: 87–89, B+: 84–86, B: 80–83, B-: 77–79, C+: 74–76, C: 70–73, C-: 67–69, D+: 65–66, D: 62-64, D-: 60-61. The grading scale for the course will be determined by adding the grading scales for the individual items. Your grade for the course will be determined by comparison to the course grading scale.

- FINAL EXAM 200 pts
- 3 EXAMS, 100 pts each 300 pts
  These exams will be given during class time, tentatively on 9/21 (Chapters 1, 2, 3), 10/26 (Chapters 5, 6), and 11/23 (Chapters 4, 7). The grading scale for each will be determined after it has been graded. Exams will consist of some problems similar to the homework and other problems designed to use course material creatively. Calculators are allowed with some restrictions. You must show your work to receive full credit.
- GRADED ASSIGNMENTS 100–150 pts
  This category consists of written homework, Maple worksheets, and a group project. “Written homework” is an activity in which the student works a specific homework problem, alone or with a colleague, and each student writes up their solution in standard English with mathematics embedded. The grade is based on the quality of the solution and the quality of the exposition.
- BONUSES
  If the letter grade you earn on the Final is higher than the letter grade you earned on your worst exam, then I will replace your lowest exam with a score corresponding to the letter grade you got on the final. I will also give 5-point bonuses to the first person to find any particular error in the textbook.

Department Grading Appeals Policy:

The Department of Mathematics and Statistics does not tolerate discrimination or harassment on the basis of race, gender, religion, or sexual orientation. If you believe you have been subject to such discrimination or harassment, in this or any other math course, please contact the department. If, for this or any other reason, you believe your grade was assigned incorrectly or capriciously, appeals may be made to (in order) the instructor, the department chair, the departmental grading appeals committee, the college grading appeals committee, and the university grading appeals committee.