Math 256

Applied Honors Calculus IV: Differential Equations, Fall 2007

Meets: Mondays, Tuesdays, Wednesdays, and Fridays.

Instructor: Professor J. Rauch, 4834 East Hall, email: `rauch@umich.edu`

Office Hours: Tuesdays, and Wednesdays, 2:00-3:00 PM, or by appointment (send email to make an appointment). Email questions are encouraged. They lead to rapid answers and alert me to problems quickly.

Textbook: *Elementary Differential Equations*, 8th edition, by W. E. Boyce and R. C. DiPrima, published by John Wiley and Sons.

Course Content: Differential equations and some linear algebra. More specifically, topics we will cover will include first-order equations (especially linear and separable equations), linear homogeneous and nonhomogeneous second-order equations, Laplace transforms, systems of differential equations, and the qualitative theory of linear and nonlinear dynamical systems. Modeling and applications will be stressed throughout. While the emphasis will be on analytical investigations and solutions, we will also be using Matlab to provide a mathematical experimentation environment. The material will largely be from Chapters 1-9 of the text. Chapter 5 will be replaced by two hours of perturbation theory. The segment on linear algebra in Chapter 6 will be substantially expanded, leaning on Matlab.

A daily schedule is posted on the class web page, and announcements and remarks will be added as they come up.

Course Website: On my homepage,

`http://www.math.lsa.umich.edu/~rauch/`

Click on Course Materials, then scroll down to Math 256.

Exams: There will be two in class midterm exams and one final exam. The final though cumulative will be weighted toward the material of the last third of the course. The in class midterms are scheduled for October 5, 2007 and November 12, 2007.

Final Exam. The final exam for *both* sections of Math 256 will be on December 14 from 1:30-3:30.

Homework: Homework will be assigned and collected weekly at the beginning of class on the date due. You may work together on the homework sets, but you must each write up and hand in the complete solutions.

I will post solutions of problems which you find particularly troublesome. You need only ask.

Course Grades: Course grades are determined according to the following formula:

Course Grade (%) = 0.2(Exam 1 (%)) + 0.2(Exam 2 (%)) + 0.25(Homework (%)) + 0.35(Final Exam (%)).