M-331 Fall 1997

Course Goals: Solving applied problems using mathematics is a multi-stage process consisting of the following steps:

- Problem formulation
- Development of a mathematical model
- Skillful use of mathematical machinery
- Solution interpretation

This course proposes to develop these skills, all essential for applied problem solving. The mathematical machinery to be presented includes applied linear algebra, methods for solving systems of linear and nonlinear equations, stability theory and perturbation theory.

Homework: Problem sets will be assigned and collected weekly. They will be graded both on content *and* orderly, concise presentation. Homework solutions should not consist merely of equations. The problem sets count for 30% of the total grade.

Maple or MATLAB: There will be no *Maple Labs* in M-331, but you may find using Maple, or another software package such as MATLAB, to be helpful in some homework problems. The use of Maple or sophisticated calculators is intended to relieve some of the drudgery of lengthy calculations or to provide a check for your work. In general you should be able to carry out all calculations without computational aids.

Collaboration: You are encouraged to discuss homework assignments with other students and the formation of study groups is encouraged. However, your written homework should reflect your own efforts and hard work.

Exams: There will be one mid-term exam on **October 13, 1997** counting for 30% of the total grade. The final exam (during finals week) counts for 40% of the total grade.

Text: The required text is *Thinking About Ordinary Differential Equations*, by Robert E. O'Malley, Jr. The course will cover the entire book although chapters 1 and 2 will be treated as review and presented more rapidly.

Instructor: Professor Kirby, EE-116, 491-6850.