# Information for students in Math 30650, Spring 2012

**Instructor:** Nancy Stanton 268 Hurley, 631-7436

Office hours: by appointment and M 2-4 p.m., Tues 2-3:30 p.m. W 3:30-4:30 p.m., Th 1-2 p.m.

email: stanton.1@nd.edu

**Texts:**

Boyce and DiPrima, *Elementary Differential Equations and Boundary Value Problems*, Ninth Edition

Manuscript of the third edition of Hunt, et al, *Differential Equations with MATLAB®*, available January 16–27 in 131 Decio Faculty Hall M–F 8:30 a.m.–4:30 p.m.

*MATLAB R2011b* available for download from OIT (go to oit.nd.edu, then under Software click on Downloads then click on MATLAB 7.13 for Students. On the Mathworks Download page, choose MATLAB R2011b, your operating system, and Download the current versions of all my products (Typical).)

**Syllabus:** We will cover chapter 4, higher order linear equations, part of chapter 8, numerical methods, chapter 7, systems of linear equations, part of chapter 9, nonlinear systems, most of chapter 10, partial differential equations and Fourier series, and chapter 6, the Laplace transform, in Boyce and DiPrima (in that order) and the related parts of *Differential Equations with MATLAB®*.

**Goals:**

- Understand linearity and its application to solving higher order linear ordinary differential equations, linear first order systems, and boundary value problems for the heat and wave equations.

- Analyze nonlinear systems of first order ordinary differential equations using approximation by linear systems, numerical solutions and phase portraits.

- Use MATLAB to solve differential equations and systems of differential equations symbolically, numerically and graphically.

- Understand the concepts of the course and use them to draw conclusions from the MATLAB output.

- Extend the key ideas of the course to study new problems.

Please read each section of Boyce and DiPrima and of *Differential Equations with MATLAB®* before it is covered in class. To do well, you **must** keep up with the homework and review frequently.

**MATLAB:** We will use MATLAB in the course for classroom demonstrations and some assignments. We will take advantage of the symbolic capabilities as well as the numeric capabilities of MATLAB. Some quiz and exam questions will involve MATLAB.

**Web Page:** The web page for this course is

http://www.nd.edu/~nancy/Math30650/info.html

On this page you will find general information about the course (including a copy of this handout), homework assignments, announcements, hints for MATLAB assignments, and MATLAB demonstrations.

**Examinations:** There will be a midterm, eleven quizzes and a final exam.

Midterm: Tuesday, March 6, at 8 a.m. in 127 Hayes-Healy

Final: 4:15 p.m. Monday, May 7

Quizzes: Wednesdays beginning January 25 except Wednesday, March 7 (the day after the midterm), and Wednesday, April 11 (the Wednesday after the Easter holiday)

Quiz problems will be similar to lecture examples, text examples and homework problems. Quizzes will be 10 points each, with the lowest quiz score dropped. More than half the points on exams will be problems similar to lecture examples, text examples and homework problems. You may use calculators on quizzes and exams.

**Homework:** The first two homework assignments are posted on the course web page. Assignment 0, your mathematical autobiography, is due January 20. Assignment 1 is due January 25. Future assignments will be posted by the due date of the previous assignment. Each assignment will include reading and problems. On some of the MATLAB homework, you will work with one or two other students. The homework from *Differential Equations with MATLAB*® will count for a significant part of your homework grade. Homework is due at the end of class on the due date, which will be one or two weeks after it is assigned. I will not accept unexcused late homework.

**Group Projects:** There will be two group projects. You will work on these in groups of three or four. The projects require learning some additional material related to the material covered in class and doing some computer work involving that material.

**Grading:**

Midterm 100 points
Quizzes 100 points
Final 150 points
Homework 100 points (after scaling)
Group projects 100 points (50 points each)

**Absence from examinations and quizzes:** If you are absent from an examination or quiz without an official excuse, you will receive a grade of zero for that examination or quiz. If you are officially excused, you will not be penalized. If you miss a test or quiz for any reason, send me an email message, call me or call the Mathematics Department as soon as possible.

**Honor Code:** Testing will be done under the Honor Code. On homework, you are allowed and encouraged to work together and discuss the problems. However, copying from ANY source is a violation of the Honor Code.