APMA 0340: Methods of Applied Mathematics II
Spring Semester 2011

Lectures: MWF 12:00–12:50pm in Kassar/Foxboro (in the Math. department)

Instructor information:

- Instructor: Assistant Professor Toan T. Nguyen
- Office: Room 328 in 182 George Street
- Phone: (401) 863-2114
- Email: Toan_Nguyen@Brown.edu
- Webpage for this course:
  http://www.dam.brown.edu/people/tnguyen/Teaching/Spring2011/APMA0340.htm
- Office hours: Mondays 9:00am-10:00am and Thursdays 1:00pm–2:00pm
  Office hours are subject to change; changes will be announced in class and posted on the above website.

Textbook:

- *Elementary Differential Equations and Boundary Value Problems,* by W.E. Boyce and R.C. DiPrima [9th edition], published by John Wiley & Sons Inc.

Purpose of the Course:

- This is the second course in the series APMA0330-0340 of elementary differential equations and it is designed to introduce students the basic techniques of ordinary and partial differential equations.
- Prerequisite: Elementary Calculus and APMA0330.

Teaching Assistants:

- The class will be split into two recitation sections: each TA will hold two hours of recitation sessions, two hours of office hours, and grade the homework for the class.
- Two TAs are
  - **Heyrim Cho.**
    Email: Heyrim_Cho@Brown.edu; Office: Room 006 (37 Manning); Phone: 401–863–1594
  - **Erich Owens.**
    Email: Erich_Owens@Brown.edu; Office: Room 005 (37 Manning); Phone: 401–863–1594
- Recitation information will be announced later by email and on the course website.

Grading policy:

- The grade is determined by homework problems, two midterms, and a final exam as follows:
  - Homework: **20%**
  - Midterm 1: **20%** on Friday, Feb 25th in class.
  - Midterm 2: **20%** on Friday, Mar 25th in class.
  - Final exam: **40%** on Thursday, May 12th, 9am-12pm.
- Your final grades will be determined by projecting on the following scale: $\geq 89\%$ for grade A, $\geq 77\%$ but $< 89\%$ for grade B, $\geq 65\%$ but $< 77\%$ for grade C, and $< 65\%$ for grade Fail.
- "Grading on the curve" is not applied in this course.

Homework:

- Homework will be handed out on Fridays in class or can be downloaded directly from the main webpage of this course.
- Homework must be turned in by 4pm on Fridays. There is a drop box in the applied math division that you can drop off your homework by the deadline.
- Late homework will not be accepted.

- Solutions of each homework will be available on the homepage of this course at some time shortly after the deadline.

Additional help:

- Besides coming to my office hours, students are strongly encouraged to come to TA recitations, TA office hours, and the Math Resource Center for help (link: http://www.math.brown.edu/mrc).

Attendance policy:

- Attendance at lectures is not mandatory, but highly encouraged.

Week-by-week schedule:

- For the tentative week-by-week schedule, visit the main webpage for the course.

Content of the course (following the textbook):

Chapter 7 Systems of First Order Linear Equations

7.1 Introduction
7.2 Review of Matrices
7.3 Systems of Linear Algebraic Equations
7.5 Homogeneous Linear Systems with Constant Coefficients
7.6 Complex Eigenvalues
7.7 Fundamental Matrices
7.8 Repeated Eigenvalues
7.9 Nonhomogeneous Linear Systems

Friday, Feb 25th: 1st mid-term exam!!! Good luck!!!

Chapter 9 Nonlinear Differential Equations and Stability

9.1 The Phase Plane: Linear Systems
9.2 Autonomous Systems and Stability
9.3 Locally Linear Systems
9.4 Competing Species
9.5 Predator-Prey Equations
9.6 Liapunov's Second Method
9.8 Chaos and Strange Attractors: The Lorenz Equations

Friday, Mar 25th: 2nd mid-term exam!!! Good luck!!!

Chapter10 Partial Differential Equations and Fourier Series

10.2 Fourier Series
10.3 The Fourier Convergence Theorem
10.5 Separation of Variables; Heat Conduction in a Rod
10.6 Other Heat Conduction Problems
10.7 The Wave Equation: Vibrations of an Elastic String
10.8 Laplace's Equation

Chapter 11 Boundary Value Problems and Sturm-Liouville Theory

11.2 Sturm-Liouville Boundary Value Problems

Thursday, May 12th: the final exam!!! Good luck!!!