

# MATH 242

## Elementary Differential Equations

### Section 006 - Spring 2015

**Meeting times:** MW 2:20 - 3:35 PM at **LeConte 112**.

**Instructor:** Dr **Peter G. Binev**

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**Office hours:** MWF 10:50 - 11:50 AM at **LeConte** 425 or by appointment.

**Text:** *Differential Equations: Computing and Modeling* by C. Henry Edwards and David E. Penney, Fourth Edition, Pearson 2007. The course will cover the material considered in chapters 1, 2, 3, 4, and 7.

**Description:** Ordinary differential equations of first order, higher order linear equations, Laplace transform methods; numerical solution of differential equations. Applications to physical sciences and engineering.

**Credits:** 3

**Prerequisites:** qualification through placement or a grade of C or better in MATH 142.

**Learning Outcomes:** Upon the successful completion of this course students will be able to:

- solve initial value problems and find general and particular solutions to ordinary differential equations of the following types: separable, exact, nonlinear homogeneous, first- and higher-order linear equations, especially those with linear coefficients, systems of two differential equations;
- develop skills at using solutions methods such as: integrating functions, substitution, variation of parameters undetermined coefficients, Laplace transforms, and approximations, for example Euler and Runge-Kutta methods;
- use differential equations to solve mixture, cooling, mechanical vibration, or electrical circuit problems.

**Outline:** The detailed tentative schedule with the covered sections and the assigned homework will be posted on Blackboard. The following shows the approximate time allocated for each of the chapters (including reviews and examinations):

- Chapter 1 - 3.5 weeks;
- Chapter 2 - 2 weeks;
- Chapter 3 - 4 weeks;
- Chapter 4 - 1.5 weeks;
- Chapter 7 - 3 weeks.

**Cell Phones and Calculators:** All electronic devices, especially cell phones, *must be disabled* during the class. No calculators are allowed.

**ADA:** If you have special needs as addressed by the Americans with Disabilities Act and need any assistance, please notify the instructor immediately.

**Attendance:** Regular class attendance is important. A grade penalty will be applied to any student missing three or more classes (10%) during the semester. The "10 percent rule" stated above applies to both excused and unexcused absences. Students who anticipate potential excessive absences due to participation in permissible events as described in the USC Academic Bulletin ([http://www.sc.edu/bulletin/ugrad/acadregs.html#class\\_atten](http://www.sc.edu/bulletin/ugrad/acadregs.html#class_atten)) should receive prior approval from the instructor to potentially avoid such penalty. Same rules apply for other potential cases of approved absences described in the Bulletin. Students should consult immediately with the instructor about the completion of the missed assignments. An incomplete grade I could be assigned if the student is unable to complete assigned work because of an unanticipated illness, accident, work-related responsibility, family hardship, or verified learning disability. In such a case, the student will have up to 12 months in which to complete the work before a permanent grade is recorded.

**Academic Dishonesty:** Cheating and plagiarism will not be allowed. You are expected to practice the highest possible standards of academic integrity. Any deviation from this expectation will result in a minimum academic penalty of your failing the assignment, and in additional disciplinary measures including referring you to the Office of Academic Integrity. The University of South Carolina has articulated its policy governing academic integrity and the students are encouraged to carefully review it: <http://www.housing.sc.edu/academicintegrity/violations.html>.

**Homework and Quizzes:** A few homework problems will be assigned each class. Be sure to solve and write these problems before the next class. No homework assignments will be collected or graded. There will be several five-minute quizzes at the end of most of the classes on problems similar to ones from the homework. Each quiz will be graded 1 for a correct answer with a possible partial score of 0.5 in case of a technical mistake. The quiz grade will be formed as the best 10 scores. It will account for 20% of the final grade. There will be **no makeup quizzes**.

**Exams:** There will be four exams in a form of a test during the semester. The tentative dates of these exams are **February 4, March 4, April 1, and April 20**. The problems on the tests will be similar to the ones from the homework and the discussions in class. There will be **no makeup exams** (as described below, you can drop one exam).

**Final Exam:** The final exam in a form of a test will take place on **Saturday, May 2, 2015 at 12:30 PM**. The problems will be from the entire material covered in the course.

**Exam Score:** The exam score accounts for 80% of the final grade. In case a student elects not to take the final exam, it is formed by the four exams during the semester (20% each). In case a student decides to take the final exam, it is formed as the best three scores on the exams during the semester, at 16% each, plus the final exam at 32%. The option not to take the final exam should be declared in writing by **April 27, 2015**.

**Grading:** The final grade will be determined from the quiz grade (20%) and the exam grade (80%). The letter grades will be assigned as follows: **A** for at least 90%; **B+** for at least 86%; **B** for at least 80%; **C+** for at least 76%; **C** for at least 70%; **D+** for at least 66%; **D** for at least 60%; **F** for less than 60%.