

Math 212 - INQ Differential Equations
Oxford College of Emory University
Spring 2012

Instructor: Dr. Ricardo Conceição
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Course Info: MW 3:30 - 4:45 Seney Hall 209
Office Hours: Will be posted on Blackboard.

Course Content: First and second-order ordinary differential equations, systems of ordinary differential equations, power series solutions, applications.

Course Objectives: At the end of the course the student should:

- Be familiar with the general ideas of ordinary differential equations;
- Be able to apply the following methods to the solution of differential equations:
 - separation of variables, integrating factor, reduction of order, undetermined coefficients, variation of parameters and power series;
- Be able to solve:
 - homogeneous linear equations with constant coefficients, system of linear first-order equations, first-order exact equations;
- Be able to apply the theory to model some real-life system and/or phenomenon.
- Be able to use technology (Eg. Sage/Wolfram Alpha) to analyze solutions to differential equations and their applications.

Text: The main text will be *Elementary Differential Equations and Boundary Value Problems* by William E. Boyce & Richard C. DiPrima; but we will also be using the free online book *Differential equations and Sage*, by Marshall Hampton, found at <http://modular.math.washington.edu/home/wdj/teaching/DiffyQ/>.

Try to read the book before coming to class: believe me, this is a very useful habit.

Class Attendance: Students are responsible for all material covered in class and any changes to the syllabus that may be announced. Any conflicts between the course schedule and religious holy days are to be negotiated in advance with one's instructor. Please be on time!

Grading Policy: Students' grades are determined by performance on problem sets, quizzes, projects, tests, and a comprehensive final exam. All tests will be administered during class time, unless special circumstances require otherwise.

Problem Sets/Quizzes	11%
INQ Projects	12%
3 Tests	54%
Final	23%
Total	100%

Maximum grade cuts are as follows:

A	B	C	D	F
90-100%	80-89.99%	70-79.99%	60-69.99%	0-59%

Plus/minus grades may be assigned for percentages near the maximum grade cuts. Also, I reserve the right to amend, append, or otherwise make changes to the plan for the course.

Any additional material needed for this class will be provided in class or via Blackboard at

<https://classes.emory.edu/>

At Blackboard, you will be able to check all your grades.

Homework: Homework problems from each section that we cover in the text will be provided during class time or by email. Although the homework will not be collected, a timely completion of these assignments is crucial to success in this course in addition to serving as an excellent preparation for the tests, quizzes and problem sets.

Problem sets: Due at the BEGINNING of class on the date indicated on the assignments. The problem sets will consist primarily of the assigned homework problems, but I may add additional questions from other sources. **You are allowed to receive help from anyone/anything to complete these assignments.** This means that others are allowed to explain concepts/techniques to you, and you can compare/verify your work with other students. However, you must be actively engaged in the process of completing the assigned problems. Simply copying the work of another student and submitting it as your own will result in zero credit. **All work is expected to be professionally submitted and points will be deducted for a lack of organization, illegible or sloppy work, and the inappropriate use of mathematical notation, even if answers found are correct.**

Quizzes: An undetermined number of quizzes will be given throughout the semester. Quizzes need not be announced ahead of time. **There is no provision for making up a quiz. You will receive a zero on any missed quiz.** Grades on problem sets are treated identically to those on quizzes.

INQ Projects: A series of inquiry based projects will be designed in order for the students to learn part of the material in an independent way. They will consist of a mix of individual and group projects. In some of these projects, you may be required to write or prepare an oral report to be presented in class. They will sometimes involve the use of the free computer algebra system *Sage*, found at <http://www.sagemath.org/>.

The first project and an introduction on how to use Sage is posted at the Blackboard website.

Tests: Will include both in-class and take home portions. Specific directions will be provided prior to the exam being given. The Oxford Honor Code applies to all tests and is **individual effort** on all portions.

★ Wednesday, February 22nd.

★ (tentatively) Friday, March 21st.

★ (tentatively) Friday, April 25th.

Final Exam: Comprehensive with no exemptions. *Please make sure to check your final exam schedule before making any trip arrangements.*

Calculators: We may use a simple scientific calculator. Calculators that compute derivatives and integrals are not allowed.

Honor Code: The Honor Code of Oxford College applies to all work submitted for credit in this course. To receive credit for work submitted you must place your name on it. By placing your name on such work, you pledge that the work has been done in accordance with the given instructions and that you have witnessed no Honor Code violations in the conduct of the assignment.

Expectations: They're high! I expect that you will read the text (several times) and attempt all the assigned homework (and more). Written responses to questions should be **grammatically correct!** I welcome your comments, criticisms, and suggestions. Please feel free to stop by my office or e-mail me with any concerns or questions that you may have.

Good luck and I hope this will be an enjoyable experience for all of you!

Student work submitted as part of this course may be reviewed by Oxford College and Emory College faculty and staff for the purposes of improving instruction and enhancing Emory education.