Math 256 **Introduction to Differential Equations** **Fall 2013**

8:00-8:50am; MTWF 185 Lillis Hall

Instructor: Dr. Jennifer Thorenson

Textbook: Boyce & DiPrima, Elementary Differential Equations, 10th Ed., Wiley, 2012

Prerequisite: Math 253

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Office Hours: Monday, Tuesday and Friday at 10am or by appointment.

Course Description: Math 256 is the introduction to differential equations focusing on techniques for finding exact solutions. A differential equation is an equation relating an unknown function to one or more of its derivatives. A solution of the differential equation is a function that satisfies the equation. In mathematical modeling, a differential equation is constructed when a quantity defining a rate of change is considered. For example, the differential equation, $x'(t) = v(t)$, relates the position, $x(t)$, of a moving object at time, t, to its velocity, $v(t)$.

Homework: A combination of WeBWorK and written homework will be assigned. Late assignments will not be accepted. However, special circumstances may be considered if notified in person prior to the due date. These assignments will be in addition to homework out of the text which will not be collected, but is mandatory. The graded homework will not provide sufficient practice to learn the material or even cover all of the material so you must keep up with the text problems as well.

Note: WeBWorK homework can be found at
http://webwork.uoregon.edu/webwork2/Math256-14652

Exams: There will be two in-class exams during the term; the first exam is on October 25 and the second exam is on November 22. The final exam is cumulative and scheduled for December 13 at 10:15am. Exams can only be taken other than the scheduled time if arrangements are made in **advance** and a valid and admissible reason for not attending the scheduled time is provided. However, faculty legislation prohibits final exams from being administered early.

Grade: The final grade will be based on homework (20%), midterm exams (25% each) and the final exam (30 %).

Classroom Environment: Disruptive behavior in the classroom will not be tolerated. Leaving class early or arriving late, unless by prior agreement with the instructor, is considered disruptive behavior. All cell phones and music players must be turned off during the class period.

Academic Dishonesty: Any type of academic dishonesty will not be tolerated. In the event of academic dishonesty, the offense will be reported to the Office of Student Conduct and Community Standards and the student will be sanctioned up to receiving a failing grade in the course.

Tentative Schedule

MONDAY	TUESDAY	WEDNESDAY	FRIDAY
30 1.1-1.3	**October 1** 1.1-1.3	**2** 2.1	**4** 2.1/2.2
7 2.2	**8** 2.3	**9** 2.3	**11** 2.4
14 2.5	**15** 2.6	**16** 2.6	**18** 3.1
21 3.2	**22** 3.3	**23** **Review**	**25** **Exam I**
28 3.3/3.4	**29** 3.4	**30** 4.1/4.2	**November 1** 4.2
4 3.5	**5** 3.5/4.3	**6** 3.6	**8** 3.6
11 3.7	**12** 6.1	**13** 6.2	**15** 6.2
18 6.3	**19** 6.3/6.4	**20** **Review**	**22** **Exam II**
25 6.4	**26** 6.5	**27** 6.6	**29** No Class
December 2 7.1	**3** **Review**	**4** **Review**	**6** **Review**
Final Exam: Friday, December 13th, 10:15am			

Course Goals:

We will cover Chapters 1-4 and Chapter 6.

The first part of the course consists of both linear and nonlinear first order differential equations and several examples of mathematical modeling and applications. The types of first order equations to be covered are linear, separable, exact and the substitution methods of homogeneous and Bernoulli. The second part of the course consists of higher order linear differential equations with constant coefficients including the Method of Undetermined Coefficients, Variation of Parameters and the Laplace transform solution method. The primary goal of the course is to introduce students to methods for finding exact solutions of ordinary differential equations and basic mathematical modeling.

Students may find Chapter two to be the most difficult due to the solution methods for first order differential equations depending largely on integration. Additionally, the methods are specific to the type of first order equation. Consequently, if the type is misidentified, not much progress can be made towards a solution. Instructors may want to spend time focusing on identifying types of differential equations and their differing characteristics while computing examples.

Solution methods for higher order linear differential equations rely on reducing the problem to an algebraic equation. While the reduction simplifies the problem, some techniques like the Method of Undetermined Coefficients and the Laplace transform method can be time intensive due to the occurence of systems of linear algebraic equations.

If you are a student with a documented disability, please meet with me during the first week of class to discuss your needs. If you have not already requested a notification letter from Disability Services outlining recommended accomodations, please do so soon.