

## Differential Equations, Math 232 Syllabus

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Welcome to the Fall 2012 section of Math 232, *Differential Equations and Linear Algebra*. The course is designed to offer a broad introduction to the topic of differential equations.

Here is the basic information for this course:

**Textbook:** *Differential Equations and Linear Algebra* second edition, Farlow, Hall, McDill, and West. Pearson Education, 2007. The book is available at the bookstore.

There is also a recitation manual that is required. It can be purchased at the UPS Store on Market Street. We are using the UPS Store to keep the price as low as possible. The manual is made available at no additional mark over the UPS Store's price:

The UPS Store  
200 Market St. (next to Save-A-Lot)  
315.265.4565  
store5986@theupsstore.com

Please contact them in advance before picking up your manual.

**Grading** The final grades are calculated using the following distribution:

- 45% 3 Tests.
- 20% Final Exam.
- 15% Homework and Webwork.
- 15% Quiz.
- 5% Clickers

**Test Dates** The tests will be given 18 September, 30 October, and 29 November. The exams will take place in your regular lecture room. You should bring your own pencils. The professor will not have any spare materials. The location will vary depending on your recitation section, and your room assignments will be given prior to the exams.

**Make up Policy** The right to miss a scheduled exam and take a make up exam can be awarded only by your professor, and will be awarded rarely and only for a serious cause. **Do not count on being able to make up a test until you have explicit permission from your professor.** If for some reason you must miss an exam, you must apply in writing **before** the exam. Include your local address, phone number, and reason with written documentation attached. If you are unable to attend the exam due to an emergency that day you must contact the professor as soon as possible and provide documentation to confirm why you cannot take part in the exam. An unexcused absence will result in a grade of zero on the exam.

**Grading** Questions about grading of any work should be submitted to your professor within three working days of the return of the work. It is best if you write down the question and attach it to your graded work, otherwise we are likely to forget the details of your question.

**Academic Accommodations** If you require any kind of special accommodation please see your professor. Requests for academic accommodations must be made during the first three weeks of the semester, except for unusual circumstances. Students must register with the Office of Accommodative Services, located in the Student Success Center, 110 ERC, to verify their eligibility for appropriate accommodations.

### **Other Important Numbers**

Department of Mathematics and Computer Science  
357 Science Center  
268-2395

**Moodle** The course moodle site is located at <http://moodle.clarkson.edu/>. Once you have logged in to moodle you should find a link to the Math 232 course pages. Follow the link and you should find the course announcements and other materials. We will post more items to the web site as the term progresses. Most of the items will appear on the pages associated with the lecture section. Some materials might appear on the pages associated with your Thursday recitation. Your grades will appear on the pages associated with your Thursday recitation.

**Quizzes** There will be an in class quiz each Thursday at **your** recitation. The quiz will consist of one problem and will be similar to the book problems announced in class that week.

**Clickers** A portion of your grade is for classroom attendance and participation. This is measured using clickers. Each day one or more questions will be asked, and you will be asked to respond using the clicker. The clicker that we are using is from Turning Point Technologies, and we recommend that you use the ResponseCard RF LCD clicker. You can purchase the clicker at <https://store.turningtechnologies.com> The Clarkson University promotional code is Z0k0.

**Homework** Some homework problem will be assigned in class and due in your recitation. The details will be given to you when they are assigned.

**Webworks** You will have an account set up on webworks, <http://black.sc.clarkson.edu/webwork2>. The user name is your regular Clarkson id. The password is different, though. Initially it will be set to your Clarkson student number. Each week approximately five to ten problem will be assigned, and the completed assignment will be due by 5:00pm each Wednesday.

The server that has webworks is behind the Clarkson fire wall. You must be on campus to gain access to it. If you live off campus you will have to schedule your time when you are on campus.

**Office Hours** We will announce office hours when they have been determined. Meetings can also be arranged by appointment.

**Academic Integrity** From the student handbook: *“The Clarkson student will not present, as his or her own, the work of another, or any work that has not been honestly performed, will not take any examination by improper means, and will not aid and abet another in any dishonesty”* Any student violating this regulation will receive a failing grade.

**Course learning objectives** At the end of the course, the student should have learned the meaning of a differential equation and an initial value problem, and should understand how these model physical phenomena. The students should be able to solve first order equations by separation of variables and using integrating factors. They should be able to solve constant coefficient homogeneous equations using characteristic roots and should be able to solve non-homogeneous equations using the method of undetermined coefficients or variation of parameters. The students will have had an introduction to linear algebra including matrix operations, determinants, Gaussian elimination and eigenvectors. The students should be familiar with the Laplace transform and its applications to solution of initial value problems.

### **Topics covered**

First order equations: existence and uniqueness of solutions, separation of variables, linear equations and integrating factors

Higher order linear equations: homogeneous constant coefficient equations, method of undetermined coefficients and variation of parameters

Introduction to linear algebra: linear systems of equations, Gaussian elimination, matrices, determinants, eigenvalues and eigenvectors

Linear systems of differential equations

Laplace transforms

Various applications

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