MAT 236 Differential Equations

Block 5 February-March 2018

Instructor: Professor Scott Jordan
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Office: Law Hall 204
Office Hours: By appointment.
Text: *Differential Equations (4th edition)* by Blanchard, Devaney, and Hall

Class Meeting Times: There will be Lecture/Discussion each morning from 9:15 a.m. until around 11 a.m. and afternoon class Monday through Friday from 1 p.m. until 2:30 p.m. We will meet in Law Hall 109.

Prerequisite(s): MAT 122 and Mat 221

Course Description from the Cornell Catalog: This course is about how to predict the future. Mathematical modeling with differential equations, initial value problems and their approximate solutions, systems of differential equations, qualitative solutions, stability analysis and an introduction to chaos, and Laplace transforms.

Course Objectives:
Upon completion of MAT 236 a successful student will be able to

- Use computer resources to analyze and interpret DE's and their solutions
- Solve a differential equation using separation of variables
- use the method of undetermined coefficients to solve differential equations
- Study the solutions of differential equations using analytical, qualitative, and numerical techniques
- Use phase lines and phase portraits to qualitatively analyze differential equations
- Use eigenvalues and eigenvectors to write solutions to a system of differential equations
- Use Laplace Transforms and their inverses to solve differential equations
- Model real life applications using differential equations

How to be successful in MAT 236:
Accept responsibility for your own learning.
Be prepared for class - read the text before class.
Complete assignments on time.
Don't get behind. Complete assignments as soon as possible. Seek help as soon as you realize you need it.

Presentations
We will be doing presentations in this class. The book has a collection of labs at the end of each chapter. The class will break up into groups and complete a lab of their choosing. Each group will create a presentation and a write-up for the lab. Presentations will be in class during the last week of the course.

DETOOLS

DETools is the software that accompanies the book. It provides students with ample computational tools to investigate the behavior of solutions to differential equations both numerically and graphically. DETools will be used throughout the block as a resource to aid you in your homework. It is available for free. A link to the download file is in Moodle. No installation is required to run the program.

Homework:

Homework is critical to your understanding of this course. The assignments are to help you prepare for the exams. Make sure that your homework is worth grading. Failure to follow the following homework submission format will result in the loss of points and may result in refusal of the submission entirely. Homework will be turned in during class. In order for your work to be considered for full credit it needs to meet the following criteria.

1. Homework needs to be stapled together in the top left corner.
2. The homework needs to be in order. The only exception is computer generated graphs. Those can be compiled at the end of the homework packet. They just need to be referenced in order in the homework section they belong in.
3. No frillies from spiral bound notebooks will be allowed. If there are, the homework will receive a zero.
4. Any homework pages that are not in the packet when turned in will not receive any points. This means that it is your responsibility to ensure that your homework contains all the required problems.
5. Homework problems are not to be put side by side in your work. All homework problems should go in order vertically. That means if I draw a horizontal line across the paper it should only cross one problem. Failure to do this will result in a zero.

Homework may be completed using Latex. Below is a short description of latex and how to obtain it. Let me know if you have any questions.

LaTeX

LaTeX is a high-quality typesetting system; it includes features designed for the production of technical and scientific documentation. LaTeX is the de facto standard for the communication and publication of scientific documents. It is most often used for medium-to-large technical or scientific documents but it can be used for almost any form of publishing. LaTeX is not a word processor! Instead, LaTeX encourages authors not to worry too much about the appearance of their documents but to concentrate on getting the right content.

To use LaTeX you will need a TeX distribution and a program to run it. They are both available for free. The website www.latex-project.org/get/ provides information on how to obtain a TeX distribution. This distribution will come with a program that you can use. I personally use texmaker. It is available for free at http://www.xm1math.net/texmaker/. If you have any questions on how to get LaTeX on your computer, please let me know.

Exams:
There will be three exams taken in class. Electronic devices are not allowed during exams unless otherwise specified.

Grade Distribution:

Homework	35%
Presentations	15%
Exams	50%

Letter Grade Distribution:

Range	Letter	Range	Letter
>= 93.00	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	<= 59.99	F

I reserve the right to adjust this grade distribution as needed.

Course Policies:
- **Changes in the syllabus**

  I reserve the right to make changes to any part of this syllabus. Changes will be announced in class and through class wide email. If changes are made, a revised syllabus will be posted in Moodle.
- **Textbook**

  It is not required to bring the textbook to class, but it is recommended since there may be times when we work from it.
- **Communication and availability**

  I am available most of the day. I leave my office sometime between 4-5 pm. I may be available to answer emails between 9-10 pm. If you email me after that time, don't expect a response till the next day.
- **Distractions**

  Other than our classroom computer, no electronic devices may be used in our classroom while class is in session. Exceptions will be made in special cases, for example if these are used in an accommodation for a disability.
- **Drop**

  I follow the college's policy on 15th day drops; i.e. in order to be eligible for a third Friday drop, you must attend every class meeting and complete all course work.
- **Academic Integrity**

  Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known.

When a piece of work is submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College's requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Catalogue, under the heading "Academic Honesty."

- **Accommodations**

  Cornell College makes reasonable accommodations for persons with disabilities. Students should notify the Coordinator of Academic Support and Advising and their course instructor of any disability related accommodations within the first three days of the term for which the accommodations are required, due to the fast pace of the block format. For more information on the documentation required to establish the need for accommodations and the process of requesting the accommodations, see http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml.