Math 2250 Linear Algebra & Differential Equations, Spring 2018

Class Meetings: MWF at 8:05-9:25 AM in WEB 1230
Instructor: Nicholas Cahill
Email: cahill@math.utah.edu
Office Hours: Monday and Wednesday 9:45-10:45 AM in JWB 118, or by appointment.
For information on purchasing the textbook, go to http://www.math.utah.edu/schedule/bookInfo/

Course Information: Math 2250 Differential Equations and Linear Algebra is a 4 credit course.
Prerequisite Information: Prerequisites: "C" or better in (MATH 2210 OR MATH 1260 OR MATH 1280 OR MATH 1321 OR MATH 1320 OR ((MATH 1220 OR MATH 1250 OR MATH 1270 OR MATH 1311 OR AP Calculus BC score of 5) AND PHYS 2210 OR PHYS 3210)).
Course Description: This is a hybrid course which teaches the allied subjects of linear algebra and differential equations. These topics underpin the mathematics required for most students in the Colleges of Science, Engineering, Mines Earth Science.

Canvas: Canvas will be used for posting course announcements, homework assignments, grades, files and any relevant supplementary material. You are also welcome to make use if the Canvas discussion board to discuss course problems or topics. You can access the Canvas page through CIS or by logging in at utah.instructure.com. Students should check the Canvas page regularly for course information and resources.
Grading: The following are the grade components and the percentage each contributes to a student’s final grade:

- **Labs (10%) assignments, (5%) attendance** - We will have weekly labs with problem sets run by a TA, with attendance taken. Each student’s two lowest lab scores will be dropped.

- **Homework (5%)** - We will have weekly homework problems due at the beginning of class on Wednesdays. Homework will be graded on completion. Extra credit will be awarded for collaborating on the homework sets.

- **Quizzes (10%)** - We will have weekly quizzes 15-25 minutes in length at the beginning of class on Wednesdays. The quiz content will be drawn mostly from weekly homework. Each student’s four lowest quiz scores will be dropped.

- **Midterm Exams (45%, 15% each)** - Three midterm exams will be given on select Fridays. You will have the whole class period to complete the exam. Dates of the midterm exams will be Friday Feb. 9th, Friday Mar. 16th, and Friday Apr. 13th.

- **Final Exam (25%)** - A comprehensive exam will be given.

- **Extra Credit** - Ample extra credit opportunities will be available. Extra credit assignments will generally focus on fostering math communication, visualization, and technology skills.

**Our final exam will be on Monday, April 30, 2018 8:00-10:00 AM in WEB 1230.**

Final course letter grades will be determined as follows: If X is your course percentage weighted according to the above, then

- A 93% – 100%
- A- 90% – 92.9%
- B+ 87% – 89.9%
- B 83% – 86.9%
- B- 80% – 82.9%
- C+ 77% – 79.9%
- C 73% – 76.9%
- C- 70% – 72.9%
- D+ 65% – 69.9%
- D 60% – 64.9%
- D- 55% – 59.9%
- E below 55%

The instructor retains the right to modify this grading scheme during the course of the semester; students will, of course, be well notified of any adjustments.

Additional Resources
• **Tutoring Center & Computer Lab**: There is free tutoring in the T. Benny Rushing Mathematics Student Center (room 155, the lower level between JWB and LCB), as well as a computer lab. For more information see [http://www.math.utah.edu/ugrad/tutoring.html](http://www.math.utah.edu/ugrad/tutoring.html)

• **Private Tutoring**: University Tutoring Services, 330 SSB. There is also a list of tutors at the math department office JWB 233.

**Calculators**: Calculators will be allowed on exams. Developing calculator skills and general technology methods will be encouraged, with a focus on documenting working methods.

**Expected Learning Outcomes:** Upon successful completion of this course, a student should be able to:

1. Solve first-order linear ODEs, higher-order constant-coefficient linear ODEs and higher-order Cauchy-Euler equations.

2. Understand the qualitative behavior of first-order nonlinear ODEs, e.g. via stability diagrams and slope fields.

3. Understand the definition of a vector space and the idea of dimension, bases, spanning, and independence of/in vector spaces.

4. Understand elementary matrix algebra.

5. Compute the determinant and the solution space of a matrix.

6. Compute the Laplace Transform of an elementary function, the inverse Laplace Transform of an elementary function, and use Laplace Transform methods to solve ODEs.

7. Compute the eigenvalues and eigenvectors of a matrix, and determine whether or not a matrix is diagonalizable.

8. Solve systems of higher-order linear ODEs with constant coefficients using linear algebraic methods.

**Student Responsibilities**: All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, and I will do so, beginning with verbal warnings and progressing to dismissal from and class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. [http://regulations.utah.edu/academics/6-400.php](http://regulations.utah.edu/academics/6-400.php)

**ADA Statement**: The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Access, 162 Olpin Union Building, 801-581-5020. CDA will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Access.