

MATH 2250-016 Fall 2014

Differential Equations and Linear Algebra (4 credits)

MWF 1:25–2:45 PM in BEH S 110

H 12:55–1:45, 2:00–2:50 in BEH S 107

Instructor: Jason Underdown
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Web Site: www.math.utah.edu/~jasonu/2250/
Office Hour: TBD & by appointment

Textbook: The textbook is a custom edition for the University of Utah. This book will also be used for the Partial Differential Equations course, MATH 3150. If you plan on taking that course, then you should buy the new custom edition. If you do not plan on taking that course, then the 3rd edition, will suffice. I don't know if there are any changes in the numbering of exercises. You will need to check with a fellow student who has the custom edition.

Title:	Differential Equations & Linear Algebra Custom Edition
Authors:	C. Henry Edwards & David E. Penney
ISBN:	9781269425575

Title:	Differential Equations & Linear Algebra 3rd Edition
Authors:	C. Henry Edwards & David E. Penney
ISBN:	0136054250

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)). Practically speaking, you are better off if you have had a Multivariable Calculus course, but it is not necessary.

Course Content: First and second order ODEs with applications to mechanics, electrical circuits, and populations. Qualitative analysis and stability. Elementary numerical methods. Laplace transforms. Linear algebra and its applications to solution spaces, systems of differential equations, and phase space analysis.

Exams: There will be two in-class midterm exams and one comprehensive final exam.

Attendance: I will be taking attendance every MWF. You will be allowed to miss five classes with no penalty. If you become seriously ill and miss more than five classes, I will accept a doctor's note which indicates the period of the illness.

Quizzes: I do not plan on administering quizzes.

Homework:

- Homework is assigned weekly. The assignments are posted on the course web site and will be due on Thursdays at the beginning of the lab.
- Late homework is not accepted.
- Homework solutions that are not stapled will not be accepted.
- Homework with spiral bound notebook fringe will not be accepted.
- Solving and writing out solutions to homework problems is where most of your learning will take place. Take pride in your work.

Weekly Lab: Every Thursday when no exam is scheduled you are required to attend a lab. The labs will be held in BEH S 107, and will be run by our TA, Kei Yuen Chan, and sometimes me. During these weekly labs you will typically be given four to six problems to solve. You will be encouraged to work in groups and the completed problems will be due the *following* Thursday along with the exercise section of your homework.

The lab basically consists of the hard problems that would normally be assigned at the end of a homework assignment. Solving these problems is the most beneficial learning experience of the course. However, since they are hard, these problems tend to get neglected when assigned as homework. Thus the lab is a dedicated hour, each week, where Kei and I will help you work these problems by answering your questions.

Maple and MATLAB Software: You will be expected to use Maple during the course to create plots for homework assignments and labs. The Maple software is capable of solving every problem you will be assigned, thus it is an ideal tool for checking your work. We will also occasionally use MATLAB scripts. You will not be tested on your knowledge of Maple nor MATLAB.

Grading: Grades will be calculated according to the following scheme:

Assessment	Percentage of Grade
Homework/Labs	30%
Attendance	10%
Midterm Exams	30%
Final Exam	30%

Grading Scale: The grade scale will be the usual: A (93-100), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D+ (67-69), D (63-66), D- (60-62), E (0-59).

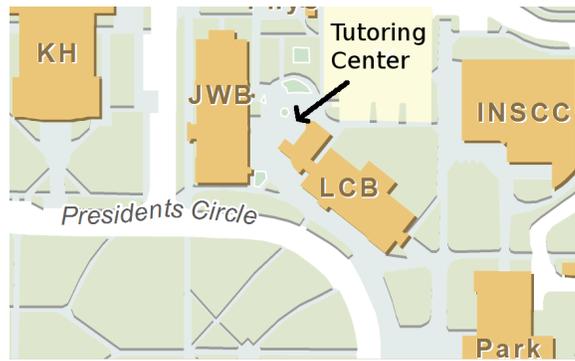
Calculators: I encourage the use of graphing calculators for homework but **not** for exams. You may use a scientific calculator during exams. For at least one of the exams you will need a calculator that can compute logarithms.

The following things are **not allowed** during exams and quizzes:

- graphing calculators
- iPad, or any iPod
- iPhone or any other smartphone

- laptop computer

Tutoring: The Rushing Math Center offers *free* drop-in tutoring, a computer lab, and study areas for undergraduates. The Rushing Student Center is underground between the LCB and JWB.



Day	Hours
Monday—Thursday	8 AM – 8 PM
Friday	8 AM – 4 PM
Weekends & Holidays	closed

Canvas: I will only use Canvas to record homework scores, lab scores, exam scores, and perhaps for announcing schedule changes. All content related to the class will be on the course web site.

Planned Sequence: I will cover the sections in the book according to the following order.

- Chapter 1 First-Order Differential Equations (1.1 — 1.6)
- Chapter 2 Mathematical Models and Numerical Methods (2.1 — 2.4)
- Chapter 3 Linear Systems and Matrices (3.1 — 3.6)
- Chapter 4 Vector Spaces (4.1 — 4.3, 4.7)
- Chapter 5 Higher-Order Linear Differential Equations (5.1 — 5.6)
- Chapter 10 Laplace Transform Methods (10.1 — 10.5)
- Chapter 6 Eigenvalues and Eigenvectors (6.1)
- Chapter 7 Linear Systems of Differential Equations (7.1 — 7.4)
- Chapter 9 Nonlinear Systems and Phenomena (9.1 – 9.4) (If time permits)

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 Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.