

# Math 17 52090 Differential Equations and Linear Algebra

Instructor: Mr. Ron Reimer Meeting Times: Daily 11:00–11:50 am Room: CCI 206	Office: FEM 1F Office Hours: TWTh 9–9:50am Email: <a href="mailto:ron.reimer@reedleycollege.edu">ron.reimer@reedleycollege.edu</a> Phone: 638-0030 ext 3355
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**Catalog Description:** This course will study solutions to first order ordinary differential equations, including separable, linear, homogeneous of degree zero, Bernoulli and exact with applications and numerical methods. Solutions to higher order differential equations using undetermined coefficients, variation of parameters, and power series, with applications. Solutions to linear and non-linear systems of differential equations, including numerical solutions. Matrix algebra, solutions of linear systems of equations, and determinants. Vector spaces, linear independence, basis and dimension, subspace and inner product space, including the Gram-Schmidt procedure. Linear transformations, kernel and range, eigenvalues, eigenvectors, diagonalization and symmetric matrices.

**Advisories:** English 125 English 126    **Prerequisites:** Math 6 Math Analysis III

**Objectives:** In the process of completing this course, students will:

1. Create and analyze mathematical models using ordinary differential equations;
2. Verify solutions of differential equations;
3. Identify the type of a given differential equation and select and apply the appropriate analytical technique for finding the solution of first order and selected higher order ordinary differential equations;
4. Apply the existence and uniqueness theorems for ordinary differential equations;
5. Find power series solutions to ordinary differential equations;
6. Find solutions of systems of equations using various methods appropriate to lower division linear algebra;
7. Determine the Laplace Transform and inverse Laplace Transform of functions and use the Laplace Transform method to solve linear initial value problems.
8. Solve Linear Systems of ordinary differential equations using eigenvalue/eigenvector methods.
9. Use bases and orthonormal bases to solve problems in linear algebra;
10. Find the dimension of spaces such as those associated with matrices and linear transformations;
11. Find eigenvalues and eigenvectors and use them in applications;
12. Prove basic results in linear algebra using appropriate proof-writing techniques such as linear independence of vectors; properties of subspaces; linearity, injectivity and surjectivity of functions; and properties of eigenvectors and eigenvalues.
13. Use appropriate technology to enhance understanding of differential equations and linear algebra.

January 15	M	Martin Luther King Jr Day, Campus Closed
January 26	F	Last day to drop a SPRING 2018 full-term class to avoid a "W" students with more than 3 absences may be dropped
February 16-19	F-M	Presidents Weekend, Campus closed
March 9	F	Last day to drop a full-term class (letter grades assigned after this date)
March 26-30	M-F	Spring Recess, Good Friday, Campus Closed
May 16	W	Final Exam, 11:00am–12:50pm, FEM 3

**Required Text:**

- Differential Equations & Linear Algebra Fourth Edition, C. Henry Edwards
- ISBN-13: 978-0-13-449718-1 ISBN-10: 0-13-449718-X

**Attendance:** In order to maintain continuity of subject matter regular attendance is imperative in any academic course. You are expected to attend all class sessions, arrive on time and stay for the entire session. If you have accumulated more than 3 absences at census or more than 5 absences on the last day to drop this class, you may be dropped from this class. Do not be late to class. If you are not present when role is taken you will be marked absent, it is your responsibility to inform me if you arrive after role has been taken.

**Homework:** Homework assignments must be written neat and organized on paper. Work on paper will be collected and scored based on completeness.

**Quizzes:** Quizzes may be given at anytime and will be weighted equivalent to one homework assignment. If you are not in class when a quiz is given you may not make it up.

**Exams:** There will be three or four exams this semester. Exam dates will be announced at least one week prior to when the exam is given. The final exam will assess the final portion of this class only. Exams may not be re-taken.

**Grades:** Final grades will be calculated based on weighted categories as follows.

Homework Assignments and Quizzes	25%
Exams	75%

**Grading Scale:**

90 < A < 100
80 < B < 90
70 < C < 80
60 < D < 70
0 < F < 60

If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

**Academic Dishonesty:** Students at Reedley College are entitled to the best education that the college can make available to them, and they, their instructors, and their fellow students share the responsibility to ensure that this education is honestly attained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to exert an entirely honest effort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences ranging from a failing grade on a specific assignment to a failing grade in the course.