Course Description: 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.

Basic Skills Advisories: Eligibility for ENGL 125 AND ENGL 126

Subject Prerequisites: MATH 6 or equivalent

TEXT: Edwards and Penny, Differential Equations and Linear Algebra, ed. 3rd Pearson, 2010.
        ISBN 978-0-13-605425-2

REQUIRED NOTES: Notes will be available on Blackboard daily. They must be printed out and brought to class.

ATTENDANCE: Students are expected to attend all class meetings, be on time, and be in class the entire class session. Calling me to tell me you will be absent **does not** excuse you. **STUDENTS LEAVING CLASS BEFORE THE END OF CLASS WILL BE COUNTED AS BEING ABSENT! Three (3) absences** may result in a drop from the course. However, if you decide to drop the course, it is **your** responsibility to make the drop official in the Administrations and Records office or else possibly receive a grade of **F.**

Behavioral Standards: Your classmates and I would greatly appreciate that students in the class take care of any personal needs (i.e., using the restroom, getting a drink, sharpening a pencil) before class begins. Please turn your phone off when entering the class. You may not use your phone as a calculator. I would appreciate that you not bring guests to class.

NOTE: The drop deadline is **March 13, 2015**.

TARDIES: Students are expected to be on time. It is distracting, rude and unfair to fellow classmates and to the instructor when a student is late. If you are not present when roll is taken you will be counted as absent.

HOMEWORK: NO LATE HOMEWORK WILL BE ACCEPTED!   When a student has not satisfactorily completed 3 homework assignments they will be dropped

TESTS: There are no makeup exams for missed tests.

FINAL EXAM: A two-hour comprehensive final exam worth 1 test will be given at the end of the semester during finals week.

Students are required to participate in all class discussions and activities. You may not start the homework during class. You may not study for another class or read a book during class.

GRADING:

- *Homework*: Homework will be worth 20% of the grade. Homework worth 10 points and homework worth 15 points will count the same.
- *In Class Tests*: All of your test percentages will be averaged and will count as 80% of your grade.

Percent of Total Points	Grade
89-100	A
79-88	B
70-78	C
60-69	D
0-59	F

WHERE TO FIND YOUR GRADE:
Available at http://sc.webgrade.classmanager.com/ReedleyCollege/ Your class will be identified by schedule number. Username and password is sent to your email that you have on record with Blackboard.

SPECIAL NEEDS REQUESTS: 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.

Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner, such as having improper access to answers, in an attempt to gain an unearned academic advantage. Cheating may include, but is not limited to, copying from another's work, supplying one's work to another, giving or receiving copies of examinations without an instructor's permission, using or displaying notes or devices inappropriate to the conditions of the examination, allowing someone other than the officially enrolled student to represent the student, or failing to disclose research results completely.

Plagiarism is a specific form of cheating: the use of another's words or ideas without identifying them as such or giving credit to the source. Plagiarism may include, but is not limited to, failing to provide complete citations and references for all work that draws on the ideas, words, or work of others, failing to identify the contributors to work done in collaboration, submitting duplicate work to be evaluated in different courses without the knowledge and consent of the instructors involved, or failing to observe computer security systems and software copyrights.

Incidents of cheating and plagiarism may result in any of a variety of sanctions and penalties, which may range from a failing grade on a particular examination, paper, project, or assignment in question to a failing grade in the course, at the discretion of the instructor and depending on the severity and frequency of the incidents.

Course Outcomes:

Upon completion of this course, students will be able to:
  A. Use matrices and their applications to solve linear systems of equations.
  B. Perform matrix computations, solve linear systems of equations and determine the bases of related vector spaces, find eigenvalues and eigenvectors, and diagonalize matricies when applicable.
  C. Find the solutions to first order and higher order differential equations and apply them to various application problems.
  D. Find the solutions to systems of differential equations using matrix methods.
  E. Use Laplace transforms to find the solution to initial value problems.

Course Objectives

In the process of completing this course, students will:
  A. Create and analyze mathematical models using ordinary differential equations;
  B. Verify solutions of differential equations;
  C. 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;
  D. Apply the existence and uniqueness theorems for ordinary differential equations;
  E. Find power series solutions to ordinary differential equations;
  F. Determine the Laplace Transform and inverse Laplace Transform of functions;
  G. Solve Linear Systems of ordinary differential equations.
  H. Find solutions of systems of equations using various methods appropriate to lower division linear algebra;
  I. Use bases and orthonormal bases to solve problems in linear algebra;
  J. Find the dimension of spaces such as those associated with matrices and linear transformations;
  K. Find eigenvalues and eigenvectors and use them in applications;
  L. 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.

COURSE CONTENT OUTLINE:

Lecture Content:

1. First order differential equations including separable, homogeneous, exact, Bernoulli, and linear;
2. Existence and uniqueness of solutions;
3. Applications of first order differential equations such as circuits, mixture problems, population modeling, orthogonal trajectories, and slope fields;
4. Second order and higher order linear differential equations;
5. Fundamental solutions, independence, Wronskian;
6. Nonhomogeneous equations;
7. Applications of higher order differential equations such as the harmonic oscillator and circuits;
8. Methods of solving differential equations including variation of parameters, Laplace transforms, and series solutions;
9. Systems of ordinary differential equations
10. Techniques for solving systems of linear equations including Gaussian and Gauss-Jordan elimination and inverse matrices;
11. Matrix algebra, invertibility, and the transpose;
12. Relationship between coefficient matrix invertibility and solutions to a system of linear equations and the inverse matrices;
13. Special matrices: diagonal, triangular, and symmetric;
14. Determinants and their properties;
15. Vector algebra for Rn;
16. Real vector spaces and subspaces, linear independence, and basis and dimension of a vector space;
17. Matrix-generated spaces: row space, column space, null space, rank, nullity;
18. Change of basis;
19. Linear transformations, kernel and range, and inverse linear transformations;
20. Matrices of general linear transformations;
21. Eigenvalues, eigenvectors, eigenspace;
22. Diagonalization including orthogonal diagonalization of symmetric matrices;
23. Dot product, norm of a vector, angle between vectors, orthogonality of two vectors in Rn; and
24. Orthogonal and orthonormal bases: Gram-Schmidt process.

Important Dates

January 12	Class Begins
January 19	Martin Luther King Day
February 13-16	Presidents Day
March 13	Last day to drop
March 30-April 3	Easter Break
May 18	Final 11:00-12:50

The final is a test. Be sure you plan to be there!

How to send an Email to Mr. Gilmore

Read the syllabus. Often, the question you would like to ask has already been answered in the material I have provided for you.

Use your Reedley College email. I am deluged with emails every day, and by using your school account, you'll have a better chance of avoiding the spam filter. Last semester I received about 800 emails from students.

Your Subject line should be the class name and time of the class only.

- Example: Math 103 8:00 AM

This information helps me organize and prioritize student emails. The section information is especially important since I often teach multiple sections of the same course.

Always use a greeting. Do not begin with "Hey" or similar colloquialisms. You should use "Dear Mr. Gilmore:"

Briefly and politely state the reason you are emailing. Offer only as much information as is relevant to the situation. Get to the point right away.

- Name the assignment or projects you are referring to instead of using pronouns or phrases, such as "this assignment".

- Example: Homework problem number 7 in section 7.1.

If you are emailing with a problem, suggest a solution. Be considerate, however, of how your solution might create additional work for me.

Sign it with your name and your student ID number (but never your Social Security number). Use your first and last name, even if you know that I know you.

Your email should be professional. It is important to use punctuation, capitalization, and complete sentences in all email correspondence to me.

Read it over. If you do not have spell-check on your email, then you can copy the message, paste it into a word-processing program, and run spell-check there. Consider not only the mechanics, but also what you have said. Strive for a polite tone, concise language, and clear purpose.

- **Allow adequate time for a reply.** Follow up if more than a few days have passed and you have not gotten a response, then it is appropriate to politely ask if I received your email and had time to consider what you wrote.

If you are simply sending me information then I may not consider a reply necessary. In this case, you are done. Example: "I have the flu and will not be in class on Tuesday, but Sue will turn my paper in for me."

If your issue is not resolved then consider an office visit.

Often the tone in emails cannot be properly judged. Rather than becoming upset, a visit in person can often remedy the situation.

- Use the words "please" and "thank you"--they really help and are universally appreciated.

- Try to contact a peer first if the purpose of your email is to find out what you missed when absent.

- Recognize that requests that may take only a few seconds to write and send, may take much longer to fulfill.

- Leave enough time for a response.

To...	Jim Gilmore
Cc...	
Bcc...	
Subject:	Math 103 8:00

Tahoma | 10 | **B** *I* <u>U</u>

Dear Mr. Gilmore:

I will not be in class on Tuesday because I am not feeling well tonight. I will ask John Smoltz to take notes for me. I will also watch the video that is located in Blackboard and then do the assigned homework in CourseCompass.

Greg Maddux
0123456