1. **Course Description:** Theory and application of ordinary differential equations including classification, initial and boundary value problems of one variable, exact equations, methods of solving higher-order linear equations, second-order equations with constant coefficients, series solutions, systems of linear equations, Laplace transforms and existence theorems.

2. **Pre-requisites:** MATH 175 with a grade of 'C' or better, or permission of the instructor

3. **Required Textbooks and Supplies:** A First Course in Differential Equations with Modeling Applications, 8th ed. by Dennis G. Zill.; a small stapler for your homework; an inexpensive scientific calculator with log and exponential functions.

4. **Course Objectives:** To give students a strong understanding of the topics mentioned in the course description above and in the topical outline below

5. **Outcomes Assessment:** Be able to solve every problem in the sections we cover. Also, learn to use Maple software. Several quizzes will be given and some homework will be graded to assess student progress. Midterm exams and a comprehensive final will be given to assess mastery of topics list on page 3 of this syllabus. Also, a Maple (symbolic manipulation software) project will be given. At the end of the semester, students will be given the opportunity to evaluate the instructor, the textbook, and the topics covered in the course.

As part of departmental analysis of outcomes in this course and its place in the Mathematics program, student completion of the pre-requisite, success in the current course, success in subsequent courses and student satisfaction will be reviewed by the instructor. A report containing this information will be submitted by department faculty to determine what, if any, changes can be made to improve the course in terms of content, focus, and instruction.

6. **Grading Policies**

   3 Regular Exams-100 points each  
   Homework, quizzes and Maple project (50 pts)- 100 points total  
   1 comprehensive final exam-100 points

   TOTAL - 500 points

Grades are determined by adding your point totals and dividing by 5.

90-100 is an A, 80-89 is a B, 70-79 is a C, 60-69 is a D, and less than 60 is an F.

**Cheating Policy:** Any student caught cheating on an exam or copying another student’s work will receive an F for the course.

**Testing Policy:** There will be NO MAKEUP EXAMS given, no exceptions. So make sure you do not miss a test. If an emergency arises and you cannot attend on test day, please contact my office at C.S.I. If you must miss a test, that exam score will be replaced with your final exam score, weighted as one hundred points. (This policy will be extended to those who don’t miss a test. Their lowest score will be replaced with the final.)

**Assignment Policy:** Homework will be collected on Fridays. I will not accept late homework, no exceptions. I will however drop your four lowest homework scores.

**Quiz Policy:** Sometimes we will have a quiz instead of collecting the homework. There will be no make-up quizzes. However, one quiz score will be dropped.

**Attendance Policy:** Homework assignments may contain components that require attendance, so be sure to come every day.

7. **Library Use:** The Library is an excellent place to find further information about topics in mathematics. The
computers in the library are available for your use in finding information from the card catalog and the internet as well as sending email. On that note, your **CSI E-mail** account is the primary source of *written* communication between you and the college. Students automatically get a CSI e-mail account when they register for courses. Messages from instructors and various offices such as Admission and Records, Advising, Financial Aid, Scholarships, etc. will be sent to the students’ CSI accounts (NOT their personal e-mail accounts). **It is the students’ responsibility to check their CSI e-mail accounts regularly.** Failing to do so will result in missing important messages and deadlines. Students can check their CSI e-mail online at [http://students.csi.edu](http://students.csi.edu). Student e-mail addresses have the following format: `username@students.csi.edu`. At the beginning of each semester free training sessions are offered to students who need help using their CSI e-mail accounts. For more information, see [http://www.csi.edu/currentStudents_/eagleInfo/studentEmail.html](http://www.csi.edu/currentStudents_/eagleInfo/studentEmail.html)

8. **Topical Outline for the Course:** We'll cover the following sections in the text:

1.1 DEs Definitions and Terminology.
1.2 Initial-Value Problems.
1.3 DE as Math Models.
2.1 Direction Fields & Autonomous DE
2.2 Separable Variables
2.3 Linear Equations
2.4 Exact Equations
2.5 Solutions by Substitution
2.6 A Numerical Method
3.1 Linear Models
3.2 Nonlinear Models
3.3 Modeling with Systems of DEs
4.1 Linear DEs
4.2 Reduction of Order
4.3 Homogeneous Linear Equations
4.4 Undetermined Coefficients
4.5 Annihilator Approach
4.6 Variation of Parameters
4.7 Cauchy-Euler Equation.
4.8 Solving System of Linear DEs
4.9 Nonlinear DEs
5.1 Modeling with higher-order DEs.
5.2 Boundary Value Problems.
5.3 Nonlinear Models.
6.1 Series solutions, ordinary points.
6.2 Series solutions, singular points.
6.3 Bessel’s and Legendre’s Equations.
7.1 Laplace Transformers
7.2 Inverse Transformers, derivatives
7.3 Translation properties
7.4 Translation properties
7.5 The Dirac Delta
7.6 Systems of Linear DEs
8.1 Systems of Linear DEs and eigenvalues
8.2 Homogeneous Linear Systems
8.3 Nonhomogeneous Linear Systems
8.4 Matrix Exponential
9.1 Euler Methods and Error Analysis
9.2 Runge-Kutta Methods
9.3 Multistep methods
9.4 Higher-order equations and systems
9.5 Second-order Boundary Value Problems

9. **On-line course evaluation statement:** Students are strongly encouraged to complete evaluations at the end of the course. Evaluations are very important to assist the teaching staff to continually improve the course. Evaluations are available online at: [http://evaluation.csi.edu](http://evaluation.csi.edu). Evaluations open up two weeks prior to the end of the course. The last day to complete an evaluation is the last day of the course. During the time the evaluations are open, students can complete the course evaluations at their convenience from any computer with Internet access, including in the open lab in the Library and in the SUB. When students log in they should see the evaluations for the courses in which they are enrolled. Evaluations are anonymous. Filling out the evaluation should only take a few minutes. Your honest feedback is greatly appreciated!

10. **Disabilities:** Any student with a documented disability may be eligible for related accommodations. To determine eligibility and secure services, students should contact the coordinator of Disability Services at their first opportunity after registration for a class. **Student Disability Services is located on the second floor of the Taylor Building on the Twin Falls Campus. 208.732.6260 (voice) or 208.734.9299 (TTY), or e-mail cmumford@csi.edu**