

# Differential Equations Course Project

In this course, you are being asked to complete a course project. This handout details the information you need to complete the project successfully. The goals of this project are to have you extend your knowledge of differential equations according to your own personal interest and to practice your new ODE skills and enhance both your technical writing and communication skills. The project is worth 20% of your final course grade. Please treat it accordingly.

**Project Description:** You have two basic options in your project. Option 1: You can find a research paper where the mathematics is ODE based and you can present that work. If you choose this option, you should plan to really understand the mathematical work of the paper and how it connects to what we have done in class. Option 2: “Do” your own ODE project-develop a model or work on a theory, etc. If you are considering this option, you can consult your text for ideas. It has lab sections at the end of each chapter. Although it is not anticipated that any single lab problem would satisfy the project requirement, you could choose a sequence of exercises and put them together, or just use them as ideas to jump start your own problem. The project may be done as an individual effort or in pairs or, in one case, as a trio but in all cases groups get a single grade assigned to them, with members and myself having input into how the credit should be allotted.

**Project Timeline:** Your project will have several deadlines associated with it. Although the majority of your project grade will be based on the final paper and presentation, failure to fully complete a step by the deadline will result in a 5 point deduction off your final grade. The project is worth a total of 200 points

1. **Project Proposal: Friday, October 16th.** [25 points] On this day you will turn in a project proposal that is no less than one page typed and double spaced. It should explain whether you are choosing option 1 or option 2, your project topic and how the topic is connected to differential equations. It should include any references you already have that you plan to be using. If you are choosing option 1, please attach one copy of your primary paper (you can consult many papers, but only attach the “main” one) as well as an idea of references you may still need to find. It should also include a detailed plan to complete your project and what you want your punchline to be that is, you should have an understanding of why your project is cool and important. If you are proposing a group project, you should also detail how each member plans to contribute. You only need to include one copy of the proposal, signed by all members.
2. **Rough Draft: Friday, November 13th:** [25 points] One component of your final project will include a formal write up of your work. You should turn in a rough draft of your project paper by Friday, November 13th at 5 p.m. It is fine to turn in your rough draft early. Drafts should be submitted by hard copy and not electronically. The length of the paper will vary between projects, but it is anticipated that no project will be adequately described in less than 5 pages. You should also include an outline of the paper with your rough draft. This is a technical paper and should include an abstract, an introduction, a paper body, a conclusion, and appendices. Figures and relevant data should be included and properly labeled. You should also make sure to cite any references you have used.
3. **Final Paper: Monday, November 30th:** [50 points] Everyone will turn in their final paper on Monday November 30th by 5 p.m. Notice that this date is before your oral presentations.
4. **Oral Presentations: Monday, December 7th and Wednesday, December 9th.** [100 points] Oral presentations will be done in class. Each project group should plan on speaking for 12 minutes if the group consists of two people or 8 minutes if solo and 20 minutes if the group is the trio. This is not a long time to explain the amount of work you have been doing, so your presentations will have to be well prepared and practiced. Your presentation should be done with the use of a computer projector in a medium such as power point. A properly timed presentation will be within a minute of the allotted time. Speaking for a significantly shorter or longer length of time will affect your project grade by at least 5 points.