

In this program you will get a chance to work on an individual project on a topic of your choice, relating to physics and/or calculus. The purpose of this project is to give you hands on experience with an open-ended, real-world problem, to learn how to read the mathematics and physics literature, to learn how to write a mathematics/physics paper that adequately explains the topic you have studied or experiment you conduct and to practice presenting your work publicly.

Project:

I would like you to choose a topic in physics or calculus that is at a comparable level to the material we are covering this quarter. You are not expected to conduct original research, but you should do some type of “hands-on” work. This could include doing an experiment of some kind, building a physical model, solving some applied mathematical problem, or creating a computer simulation. I will place some books containing ideas that you might find useful on closed reserve in the library. I will also post some links to suitable resources on the program web page. You should submit a one page proposal, including an annotated bibliography by Tuesday of week 2.

Project Paper:

I would like you to submit a ten paged double spaced paper by Tuesday of week 10. A rough draft is due by the end of week 8. Your paper should start with a general introduction giving motivation for the topic you are studying. You should carefully present the model, taking care to define all terms and symbols and explain the assumptions being made. You should clearly specify a research question you want to answer. The body of your paper should outline what methods you used to analyze the problem and what inferences you are able to make. Your concluding paragraph should answer your research question, state the limitations of your model or experiment and allude to possible generalizations or improvements that could be made to the model. Your paper should include a title and bibliography. Your paper should include graphs and properly formatted equations.

Project Presentations:

Project presentations will start week ten. Your presentation should be twenty minutes long, with an additional five or ten minute for questions. In your presentation you should start with some background information about the problem you are modeling or the experiment you are conducting. Your objective is to teach the class about your work, so make sure you explain all terms clearly and check that your audience follows your explanations. You are encouraged to make use of demonstrations and visual aids to help explain your results.

Timeline:

Week 2: Project proposal due

Week 3: Group Critique: Share your ideas with the class

Week 7: Group Progress Report Meeting: Meet David in small groups

Week 8: Draft of paper due

Week 10: Final paper due, presentation