

Term Project Guidelines

Physics 123 “Majors and Minors Section”

Your term project is a chance for you to explore some aspect of the course material in greater depth than we have done in class. It is also a chance for you to get some experience tinkering with real physical systems, mathematical models, and/or computer simulations. You should take this project seriously, but if you are stressed or are not having fun, then you probably don't understand what I expect. Examples of some good term project are on the class web page.

Your project may be an experiment, a mathematical derivation, a computer simulation, or a mixture of the three. I expect you to pick a project which is not trivial – something that will require at least 15 hours of work per person (not including time spent at the hardware store, etc.). At the same time, I encourage you to pick a project which is not overly difficult or which you will not be able to complete by the end of the semester. You'd probably do well to pick a project which you think you can complete in about 7 hours, because they always take longer than you'd expect.

You will be pretty much on your own to come up with the materials and facilities needed to complete your project, so make sure that you propose something that can be done on a student's budget with things you can easily find around the house, on campus, at a hardware store, etc. If you have a good idea but need help getting access to some equipment, I will help you as much as I can, but my resources are limited.

You may work on the project alone or in pairs. I would encourage the latter, since you will end up learning more if you work with someone else. Never-the-less, I expect a project done by two people to be twice as much work as a project done by one person. If you come up with a project which is fairly ambitious, but which could be completed by a group of more than two people, I may consider letting you work in a larger group. Any group larger than two people must be approved by me ahead of time.

There will be three aspects of this project which will be emailed to me by a deadline and graded: the proposal, the progress report, and the final write up of the project. The proposal and the progress report should be typed as text in the body of your email. If you need to include figures, they can be attached to the email (make sure you use a common format like jpg that I will be able to open). The final write up should be formatted nicely and sent to me as a pdf file (if you need help converting you write up to pdf, please talk to me).

The projects will be graded according the rubric at the end of this document. I have tried to be specific so that you know exactly what you need to do to get the grade you want.

Proposal

The proposal is a short description of what you plan to do along with evidence that you have thought about the project enough to determine whether it is feasible. This will let me know if you have put some thought into your project, and will allow me the chance to give you helpful feedback before you've invested too much time in the project. You should include any calculations you have done to predict the results you expect, and describe the materials you will need and where you will get them. This report should be emailed to me by midnight on the date listed in the class schedule, and should be no longer than 650 words (much shorter is encouraged – give me the relevant information but don't make me spend more time than is necessary to read it). If you show that you have put thought into your proposal, you will receive full points – even if I determine that the project you have selected is not feasible or appropriate. Your proposal is a chance to get feedback from me without being graded on the relevance or difficulty of the project.

Progress Report

By midnight on the date listed in the class schedule you will email me a short (less than 650 words – shorter is better) description of what you have done on your project. This will help motivate you to get working on your project rather than waiting until the last minute. This way if there are unforeseen difficulties with your project, you will have time to rectify them. In this report you should list what you have done, what you have left to do, and the timeline you expect for completion of your project. You may also include requests for advice from me on any aspect of the project that is giving you trouble. To get full points you need to show me that you have made significant progress on your project, and that you are on track to complete your project on time.

Final Write Up

After you have made your measurements or calculations, etc, you will be required to do a write up of your work. This write up should include things such as a description of what you did (photos or diagrams are often useful here), what results you expected to see, what results you found, and possible explanations for any discrepancies between what you measured and what you expected to measure, for example. Graphs of results and photographs of your experiment would also be useful. Your write up should be fairly short. Your write up should be long enough to give a good description of what you did, but not longer --- on the order of 2 to 5 pages. I expect your write up to look nice and use correct grammar and spelling. I will not, however, be grading your writing style (since I don't have time to teach you writing skills, and I don't think its fair to grade you on something I haven't taught you).

Physics 123 section 2 Term Project Grading Rubric

<i>Category</i>	<i>Description</i>	<i>Score</i>
Proposal (10 pts)	Did you submit a proposal on time? Did your proposal show evidence that you had put some thought and planning into your project? Was your proposal less than 650 words and in the correct format (text in body of email, figures as attachments if needed)?	
Progress Report (10 pts)	Did you submit a progress report on time? Did your progress report show evidence that you had made significant progress on your project, and that you were on track to complete your project on time? Was your proposal less than 650 words and in the correct format (text in body of email, figures as attachments if needed)?	
Format, appearance, and length (10 pts)	Was your write up formatted correctly (as a pdf file)? Was it the correct length (2-5 pages)? Did it look nice? Did you present your results in a way that is easy to understand? Did you appropriately make use of graphs, photographs, etc.?	
Relevance of project (15 pts)	Did your project focus on the concepts covered in Physics 123?	
Difficulty of project (15 pts)	Did your project require some brainwork? Did it require you to learn something significantly beyond what you did in the home work and the walk-in labs? Is the work you did something that should take at least 15 hours per participant?	
Understanding and Analysis (20 pts)	Does your write up give me the impression that you really understand what you have done? Did you draw correct conclusions from your results? Did you address possible errors in any measurement you made? (Note: I don't expect you to know how to do hardcore statistical analysis of errors, etc. But I do want you to think about possible errors you might have made.) If you didn't get what you expected, did you have any idea why?	
Overall Assessment (20 pts)	Does your project seem cool, fun, and interesting? Would other people enjoy reading your write up? Does your project make people excited about physics? Was the overall project done well, presented well, etc.?	