Physics 400
Physics Capstone Syllabus

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Physics 400 is a required class for the Bachelor of Science in Physics; this syllabus is an overview of the course structure for this seminar-style course whose purpose is to help you be successful in your capstone project, and to help enhance your skills as a physicist.

Goals of the Physics Capstone

1. To help you through the process of writing a capstone research proposal and delivering an oral proposal defense.
2. To explore a physics topic completely new to you, and draw upon all that you've learned to create an example of your best work.
3. To gain more experience in using reproducible research methods; you will use the Open Science Framework osf.io to collect all your work and upload all your references, Jupyter Notebooks, your final paper, and your final talk.
4. To further your understanding of error analysis when dealing with experimental data.
5. To further improve your oral presentation skills.
6. To further improve your written communication skills.
7. To further improve your capability to create journal-ready papers in LaTeXformat.
8. To use a wide variety of information resources, such as libraries, computer databases, finding and consulting experts.

Requirements for your capstone project

Every physics capstone project will have the following components:

1. A formal written proposal in LaTeX format; this proposal must be approved by your faculty mentor and the entire physics department faculty.
2. You **must** create an Open Science Framework osf.io account in which all your work will be posted. Creating this account is free for you to do.
3. You must make a 15 minute final oral presentation before the entire department; followed by a question/answer session of no more than 10 minutes.[1]

[1] Outstanding presentors will be invited to also present in front of the introductory physics class (121 or 123)

4. You must also turn in a final written presentation in ReVTeX format.
5. You may finish your entire capstone project during the course of the semester; however, if you do not, you will need to sign up (in the following semester) for a physics independent study (as pass/fail) and present a final talk and paper at the conclusion of your research.

Structure of the course

The structure of this course will consist of weekly seminar style meetings where we will

- discuss contemporary journal articles ,
- learn how to write a resume in LaTeX format,
- prepare students for job interviews,
- have graduate school bound students write a personal statement,
- discuss job related issues you may face after graduation and how to address them,
- gain more experience in data analysis through short assignments,
- gain more experience writing in the scientific genre through short assignments,
- gain more experience making presentations through required short presentations,
- see how to setup and use Open Science Framework osf.io ,
- discuss everyone's capstone's progress,
- and provide a forum to answer questions about your research topic.

Textbook:

There is no required text for the course. I will supply needed handouts and journal articles for each seminar class. Your own capstone project will require additional references which you will locate.

Assessment

Your grade in this course will be based on participation, satisfactory completion of in-class assignments, and on your proposal, final presentation, and final paper.

Group A:	
Class participation	100 pts
Class Assignments	200 pts
Open Science Framework Site	100 pts
Written Capstone Proposal	100 pts
Oral Capstone Presentation	100 pts
Group B:	
Final Oral Presentation	200 pts
Final Written Report	200 pts
Total:	1000 pts

Note: There are two grading schemes:
1) If you finish the entire capstone during the semester: complete Group A and Group B: 1000 points (all spelled out above). 2) If you do not finish the capstone research project and need an extra semester (i.e. PHY390 or PHY410), then complete Group A (600 ponts)