

Syllabus for PHYS 412 (Section 1)
Special Topics: Qualitative Methods in Problem Solving – Fall 2014

Class Times: Mondays, 6:00-7:00 PM, JCL 219

Instructor Information: Dr. Mike Larsen

Office Phone: 843-953-2128

Office Hours: Mondays 12-1 PM; Tuesdays 1-2 PM; Wednesdays 9:30-10:30 AM and 12-1 PM. (But stop by anytime, just realize that other times I'm not certain to be there or available).

Office Location: JCL 217 (I also am sometimes in my labs during office hours – JCL 220, JCL 221, and Lightsey 336. Check the door of room 217 for my current location. Note that I also leave my door closed pretty often for the air conditioning in my office; if the door says I'm there, please knock! If I'm un-interruptible, there'll be a note on my door that says so.)

Email address: LarsenML@cofc.edu (please use sparingly; I'd rather talk to you in person if you have a question or a concern.)

Prerequisites: Instructor Permission

Course Webpage: http://larsenml.people.cofc.edu/phys412_fall14.html
(Please see course page for full description of course, rationale, and supplementary information).

Attendance Policy

This course is a bit unlike your other Physics courses; there is no text to speak of, no set list of topics necessarily covered on certain dates, and much of the course content is discussion and conversation based. There is also not much graded material for the class, therefore your attendance is expected and will be part of your grade for the course.

Textbook

No textbook is required for this course. (By the way, many of the "Physics GRE" prep texts are not very good or an accurate depiction of what is on the test, so I wouldn't waste your money on them).

Final Exam Time Slot:

Monday, December 8th, 2014 from 7:30-10:30 PM. We will not be having a final exam, but we will use the time. It is expected you will be there. (I will bring food).

Classroom Policies

Please treat your classmates and professor with the respect due to them as fellow adults and human beings. Your professor always reserves the right to dismiss you from the room.

Cell phones – Few things irritate your professor as much as having his lecture interrupted by a cell phone ring. It totally makes him lose his train of thought. Please be considerate and turn it on vibrate during lectures.

Tardiness – This class only meets once a week for an hour, and there’s a lot of stuff we’d like to accomplish – so please be on time. Regular tardiness will adversely influence your final grade.

Despite the above, note that I expect this class to be pretty low-key and genuinely fun for everyone. Given the hour, if you want to bring in something to snack on, that’s appropriate – just try not to bring in a full meal or anything.

Grading

Grades will be based on the following:

- Attendance/Participation: (30%)
- Fermi problem exercise (20%)
- Completion of 5 sample GRE tests: (50%) (*Your numerical performance on these tests will not be part of your course grade, but the effort/work you put into them will.*)

The expectations and requirements for the Fermi problem exercise will be distributed later in the semester.

Grading Scale: The formal numerical scale might move around a little bit depending on the class’ performance, but the final grading scale will be *no more stringent* than:

A	>90	C+	79
A-	90	C	71-78
B+	89	C-	70
B	81-88	D	60-69
B-	80	F	<60

Honor Code / Code of Conduct It is expected that you will adhere to the university’s honor code and student code of conduct, as can be found in your student handbook.

Students with Disabilities The College will make reasonable accommodations for persons with documented disabilities. Students should apply at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying your professor as soon as possible and subsequently contacting your professor again at least one week before any specific accommodation is needed.

Course Goal

This course seeks to aid students in developing the skills and knowledge necessary for success on the subject Physics GRE exam.

Learning Objectives

This course endeavors to aid the motivated student in the following tasks:

- Understanding the purpose of the Physics subject GRE and the general format and structure of the exam.
- Develop effective test-taking strategies for completing the Physics subject GRE.
- Reviewing previous course content from other undergraduate Physics courses in an effort to prepare for the Physics subject GRE.
- Develop a familiarity with general “qualitative reasoning” skills (e.g. dimensional analysis, scaling, symmetry, limiting cases, estimation, etc.) in order to attempt so-called “Fermi problems”.
- Understand the process of applying to a Physics graduate program.

Learning Outcomes

At the end of this course, successful students will be able to:

- Use qualitative reasoning skills to remove incorrect choices on GRE-like multiple choice tests.
- Use previous Physics course knowledge and/or qualitative reasoning skills to create “Fermi problems” and establish reasonable bounds on their solutions.
- Develop an effective personalized test-taking strategy for the Physics subject GRE.