

Physics 399: Senior Seminar

Gustavus Adolphus College Fall 2022

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Office Hours: MTWRF 12:30 – 1:30 p.m. Shoot me an email if you have a question and we can email about it or meet in person. Always willing to help.

Course Philosophy: The GRE Physics Subject Test is a test of *your* problem solving ability in a timed multiple choice format. The only way to improve your performance from the beginning of the semester to the exam time is to practice, practice, and practice! You will find it beneficial to have a set of memorized equations in your physics tool box. Even if you are not planning on taking the GRE Physics subject test this course will be beneficial in several ways. Specifically, you will review much of undergraduate physics, prepare a C.V. or resume, prepare an “elevator talk”, and review scientific literature.

Course Description and Objectives

Catalog description: *This course provides a review of principal topics from across the core areas of physics. Students will prepare solutions to problems from the Graduate Record Examination in physics as well as review journal articles on current physics research topics*

Seminars are gatherings to exchange ideas. In this course we hope to present a ‘holistic culmination’ of your physics education at GAC. This is to be through review of previous material, preparation for post GAC physics, and a preview of material and communication you will encounter in your future studies/career.

We will discuss what comes after graduation, including graduate school and industry jobs. Since some of you may be taking the GRE, we will review pertinent material from the first three years of the major and practice techniques and strategies for taking the GRE. In addition we will distribute sample GRE questions, and review problem sets.

In addition to reviewing physics topics important for the GRE, we will be making new connections across your previous coursework through a broad look at this material. Also, we will develop a C.V. and “elevator talk”. Current research will be developed in a ‘journal club’ style format, where we will read and discuss articles in class. Written and presentation homework components will allow groups of students to explore a topic of their choosing further.

Course Policy and Evaluation

1. Class Meetings: The class will meet 10:30-11:20 Tuesday and Thursday. Students will be expected to have worked all assigned problems and read assigned materials before coming to class.

2. Attendance: Regular and on-time attendance at all class meetings is expected and this information will be collected by your instructor. Students will be held responsible for informing themselves of all announcements and assignments made in the classroom, and by e-mail messages. Students must advise the instructor in writing during the first week of class of any scheduled or anticipated athletic, music, or other college activities that will require their absence during the semester. Such written notice does not imply a waiver of attendance requirements. Any class missed without a valid reason and prior notification will result in zero credit for that day.

3. Homework and Academic Honesty: Problem sets assigned during GRE preparation will be assigned in class. You must come prepared to discuss/present your solutions and methods to the class. You must be prepared to explain your solution and approach, whether it was correct or not. None of these problems will be turned in for grade, but will be evaluated on a 5 point scale as discussed below.

Reading, writing and presentation homework will be assigned in class. You are encouraged to discuss these assignments with your classmates and to use all resources at your disposal, but all work must follow academic honesty guidelines including those on proper citation, plagiarism and copying.

4. Practice GRE Exam: There will be one 85-minute GRE practice half-exam administered at the beginning of the semester. You must take the GRE practice exam to complete the course with a passing grade. Exams will be graded and the scores reported to each student. The exam score will play no role in calculating final grades.

5. Evaluation: The course grade will mainly be based on an average of **daily** evaluations of **preparation, participation, and performance** on a 5 point scale. Assignments will also be graded on a five point scale but will be scaled to match amount of work required (e.g. the presentations will be worth more). Final course grades will be assigned using the following scale as a guide:

94-100 A	82-86 B	70-74 C	58-62 D
90-94 A-	78-82 B-	66-70 C-	0-58 F
86-90 B+	74-78 C+	62-66 D+	

6. The 5 point scale:

0 points: No attendance.

5 points: The assignment was completed before class. Answers / topics were presented or discussed clearly (and correctly for problems). There is evidence of additional participation through questions of / discussion with others.

Approximate weighting will be 70% for problem presentations, 10% for C.V. and elevator talk, and 20% for journal club paper presentations.

7. To do well in this course: See the 5 point scale above and **PARTICIPATE!** The most common grade surprise in this course is for those students who think showing up on time will give them a 5. Sitting quietly through a discussion earns at most a 3.

8. Incompletes: A grade of Incomplete will only be given when course requirements are not completed due to circumstances beyond the control of the student. [College policy]

9. Academic Accommodations: Gustavus Adolphus College is committed to ensuring equitable and inclusive learning environments for all students. If you have a disability and anticipate or experience barriers to equal access, please speak with the accessibility resources staff about your needs. A disability may include mental health, attentional, learning, chronic health, sensory, physical, and/or short-term conditions. When appropriate, staff will guide students and professors in making accommodations to ensure equal access. Accommodations cannot be made retroactively; therefore, to maximize your academic success at Gustavus, please contact them as early as possible. Accessibility resources staff are located in the Academic Support Center (<https://gustavus.edu/asc/accessibility/>) (x7227). Accessibility Resources Coordinator, Corrie Odland (codland@gustavus.edu), can provide further information.

10. Academic Honesty: By writing your name on any graded assignment for this class, you are attesting to the fact that it has been completed in accord with the college's academic honor policy. I take this responsibility seriously and I expect that you will also. If you have any doubt about what constitutes appropriate use of someone else's work, please ask.

Senior Seminar Course Schedule (Fall 2022)

Week	Tuesday	Thursday
1	Course and GRE Intro	Take first half of GRE exam
2	Mechanics	Mechanics
3	E&M	E&M
4	Optics	Stat. Mech. & Thermo
5	Atomic / Modern Physics	Quantum Mechanics
6	Relativity	Electronics and Lab Methods
7	Special Topics	Last half of GRE exam

Then we will proceed to C.V./resume crafting, “elevator talk” creation, and finally “journal club” presentations.