

Review Material will consist of groups presenting (teaching) the introductory topic(s) for the day to the rest of the seminar class. You will be divided into teams of 2-3 students. You must all participate in explaining the material to the class, and in engaging the class in some relevant activity (problem-solving, question and answer, discussion, etc.). Note you do not have to cover every detail or subtopic of the day's material from the textbook, but you should cover the main ideas well.

The Oral Exam will consist of a 30-45 minute individual session with at least two of the physics professors present, in which we ask you to solve and explore several introductory problems on the board. You can expect one problem from mechanics, one problem from electricity and magnetism, and one problem from modern physics. If you get stuck on something, we will prompt and assist you.

Demo project After changing groups into new groups of 2-3, you will conceive of and build a piece of demonstration equipment to illustrate a physics concept. You'll first turn in a proposal for approval by me, then work together to order parts and build and troubleshoot the piece of equipment, and finally demonstrate it to the rest of the class near the end of the semester.

MCSP Reflections/Resume The MCSP department offers a series of talks that appeal to a broad range of interests related to math, computer science and physics. Members of this class are invited to attend all these talks; however, for this course attendance for **at least two** of these talks is mandatory. Within **one week** of attending a talk you must submit (via a link on Inquire) a full-page single-spaced paper reflecting on the discussion. (Note that for recorded talks, you may submit your reflection beyond the one-week deadline.) This should be not only a summary of the content, but in addition a personal contemplation of the experience. You may submit MCSP reflections for this course that you have written for other MCSP courses. You will also be expected to create a draft of your resume as part of our discussion of career options for physics majors.

Article presentation After changing groups a second time, again into groups of 2-3, you will choose a recent research article from a group of articles I will supply to you. You will work as best you can to understand the article, and then lead a discussion of the article with the rest of the class.

Article discussion You are expected to participate actively in the discussion of the articles led by other groups. In order to participate, **you are responsible for reading the articles being presented by other groups before their presentation.**

Final paper: For your final paper, you will write a report in which you explain and explore one of the articles presented by a different group in the class. The final paper should be 4-5 pages in length, should be double-spaced, and should attempt to connect the physics in the article with the introductory physics we have reviewed this semester to the greatest extent possible.

Policy on Late Work:

It benefits you, especially as you move toward employment or further studies in graduate school, to be timely and punctual with your work. Assignments will be due at the start of class on the due date. I will grade an assignment with a 10% lateness deduction if turned in by 5:00PM on the due date. Following that, assignments will receive a further 20% lateness deduction for each successive school day late (with days considered to end at 5:00 PM). Assignments more than three days late will receive no credit.

Attendance Policy:

You must notify me in advance if you must miss class for a valid reason (an excused absence). For each unexcused absence past the third, two points will be deducted from your final semester average.

Expected Hours of Work

In this course, you are expected to spend at least 12 hours per week inside and outside of class.

Academic Integrity:

To ensure fairness across the class, the College's academic integrity policies are enforced. You should work solely within your group (and potentially with me or a Writing Center tutor) on group projects, and on your own (and potentially with me or a Writing Center tutor) for all other assignments. If you are in doubt about whether a specific collaboration is allowed, please ask me.

Regarding the use of generative AI tools such as ChatGPT, since a central goal of college courses like this one is to help you become independent and critical thinkers, you are discouraged from extensive use of generative AI tools to create text as part of your work. If you do use AI-generated content in your assignments, you must clearly indicate via citation what work is yours and what part is generated by AI. In such cases, no more than 20% of your work should be generated by AI. Any AI-generated work not cited and/or used for more than 20% of your assignment will be treated as though it were plagiarized. If any part of this policy on generative AI use is confusing or uncertain, please reach out to me for a conversation before submitting your work.

Accessible Education Services:

Accessible Education Services (AES) is located on the first floor of the Bank Building. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Dustin Persinger, Assistant Director of Academic Services for Accessible Education, at 540-375-2248 or by e-mail at aes@roanoke.edu to schedule an appointment. If you have registered with AES in the past and would like to receive academic accommodations for this semester, please contact Dustin Persinger at your earliest convenience to schedule an appointment and/or obtain your accommodation letter for the current semester. The testing center, also located on the first floor of the Bank Building, can be reached at 540-375-2247.

Writing Center:

The Dr. Sandee McGlaun Writing Center and Subject Tutoring, located in the lower level of the Fintel Library (Room 5), offers free one-on-one support in writing, oral presentations, and course content such as Business, Economics, Mathematics, INQ 240, Modern Languages, Lab Sciences, and Social Sciences. Open Sunday–Thursday from 4–9 PM, students can stop by or schedule through Navigate by selecting “Schedule an Appointment” → “Writing Center and Subject Tutoring” → “Writing Support” or “Course Tutoring” → preferred date and tutor. Contact subject_tutoring@roanoke.edu or 540-375-2590 for more information.

Week	Date	Topic	Assignments due
1	12-Jan 14-Jan 16-Jan	Introduction and overview Review PSE Ch 1-3 (1-d motion, vectors) Review PSE 4-6 (2-d motion, Newton's Laws)	
2	19-Jan 21-Jan 23-Jan	MLK Day: No class Review PSE 7-9 (conserv. energy, linear momentum) Review PSE 10-12 (rotation, ang. momentum, statics)	
3	26-Jan 28-Jan 30-Jan	Review PSE 13-15 (gravity, fluids, oscillations) Review PSE 16-18 (sound waves, standing waves) Review PSE 19-20 (temperature and FLOT)	
4	2-Feb 4-Feb 6-Feb	Review PSE 21-22 (engines and entropy) Review PSE 23-25 (electric fields and potential) Review PSE 26-28 (capacitance, resistance, DC circuits)	List of demo project ideas List of physics careers
5	9-Feb 11-Feb 13-Feb	Review PSE 29-31 (magnetic fields, Faraday's Law) Resume building/career exploration with PLACE Review PSE 32-34 (inductance, AC circuits)	
6	16-Feb 18-Feb 20-Feb	Review PSE 39 (relativity) Review PSE 40 (intro quantum physics) Review PSE 41 (quantum mechanics)	Resume/CV draft
7	23-Feb 25-Feb 27-Feb	Take Force Concept Inventory (FCI) in class Demo project draft presentation Oral Exams/ Demo Project Work	Demo project abstract
8	2-Mar 4-Mar 6-Mar	Spring Break No classes	
9	9-Mar 11-Mar 13-Mar	Oral Exams / Demo Project Work Oral Exams / Demo Project Work Oral Exams / Demo Project Work	
10	16-Mar 18-Mar 20-Mar	Oral Exams / Demo Project Work Oral Exams / Demo Project Work Overview of physics research literature	
11	23-Mar 25-Mar 27-Mar	Selection of research articles by groups Work on article reading/presentations Work on article reading/presentations	
12	30-Mar 1-Apr 3-Apr	Article 1 presentation/discussion Article 2 presentation/discussion GOOD FRIDAY: NO CLASS	
13	6-Apr 8-Apr 10-Apr	Article 3 presentation/discussion Final paper work/Demo project work Final paper work/Demo project work	Final paper topic
14	13-Apr 15-Apr 17-Apr	Final paper work/Demo project work Demo Project Presentations Demo Project Presentations	Rough draft of final paper
15	20-Apr 21-Apr	Receive commented drafts of final paper No class	Demo project documentation
16	24-Apr	Final Paper Revision Due (No Written Final Exam)	Revision of final paper

Note: Chapters indicated as PSE are from Physics for Scientists and Engineers, Serway/Jewett, 9th Ed.