PHYS 2620: Modern Physics

Lecture Sessions:	Mo, We, Fr: 13:00 – 13:50	Rm. A101, Nau Hall
Instructor:	Dinko POČANIĆ	⟨*pocanic@virginia.edu*⟩
Instructor Office Hours:	Mo 10:00 – 12:00, Th 13:30 – 15:00	Rm. 165/Physics
Discussion Sessions:	We 16:00 – 16:50; Th 16:30 – 17:20	Rm. 104, Warner Hall
Teaching Assistants:	Sujit BATI ⟨*kpu8qx*⟩, and	Philip Velie ⟨*pmv8ev*⟩
S. Bati's Office Hours:	Tu 15:30 – 16:30, Fr 14:00 – 15:00	Rm. 314/Physics
P. Velie's Office Hours:	Fr 15:30 – 17:00	Rm. 120/Physics
Prerequsites:	PHYS 1720 or 2410 or 2415, and MATH 2310, or instructor permission	

Course textbooks

Primary: Stephen T. Thornton, Andrew Rex, Carol Hood, *Modern physics for scientists and engineers*, 5th ed., (Cengage Learning, 2021), [4th ed. is also suitable], or

Alternate: Kenneth S. Krane, *Modern physics*, 4th ed., (Wiley, 2019); [3rd ed. is also suitable].

The textbooks are set up for online access; students may in addition, or instead, purchase a hard copy or a used book. Additional course materials will be posted on Collab.

Class organization

Students are expected to achieve a quantitative understanding of the foundations of modern physics, including a working knowledge of the subject in solving practical problems. The course comprises lecture sessions, problem discussion sessions, and weekly homework assignments. Discussion sessions and homework assignments supplement the lectures in a significant way. A student is unlikely to gain a passing proficiency in the course material without working out the course assignments **on their own**. Discussing problems with colleagues is encouraged — however, students should work out the final solutions on their own. Homework problems will be assigned one week before the set is due. No late homework will be accepted, except when arranged with the instructor in advance.

Most problem sessions will include a short quiz to help gauge student progress in the course in a timely manner. Polling questions during lecture sessions serve an analogous purpose. Solutions to homework problems, midterm exams and discussion session quizzes will be posted on UVACollab. Grading will be done using Gradescope.

The final grade for the course will be composed of the results of: in-class polling questions; midsemester exams; graded homework; discussion session quizzes; and the final exam, as follows:

• in-class midsemester exams (closed book, pledged)	25% of final grade,
• in-class polling & reading quizzes	10% of final grade,
• weekly homework assignments	30% of final grade,
• discussion session quizzes	10% of final grade,
• final exam (closed book, pledged)	25% of final grade.

There will be no makeup or extra-credit exams or assignments. Except in emergency cases (e.g., sudden illness), a valid excuse for a missed exam can only be obtained before the exam. Alarm clock problems, clock changes due to start/end of daylight saving time, etc., are not valid excuses for missing an exam. Letter grades will be assigned on an absolute scale using the default UVACollab undergraduate percentage thresholds posted in SIS.

Best practices maximizing physics learning outcomes

1. Read related sections of the textbook, and any reading assignments before each class.
2. Do not hesitate to ask questions at any point in class/discussion section.
3. Show **all** your work in homework and exam problem solutions (more details below).
4. Check that your solution includes correct physical units, sensible orders of magnitude and the appropriate number of significant figures, usually no more than 3.

Homework, quizz, and exam papers will be graded based on clarity, logical structure, physical insight, in addition to mathematical manipulation. Spelling, grammar, and neatness influence the overall assessment. Please use this opportunity to practice scientific writing; doing so helps to organize and utilize acquired knowledge. A set of assessment rubrics will be considered when grading HW and exam papers; the rubric schema is posted on Collab.

Typically, every solution should include:

- a diagram or figure to illustrate the problem or your solution, if applicable;
- definitions of variables used in the problem;
- physical laws applied and relevant equations;
- clear statements of any assumptions made;
- algebraic answer (when appropriate), clearly boxed;
- numerical answers (when appropriate): a clearly circled answer with units and appropriate number of significant figures;
- interesting conclusions or insight gained from the solution.

Honor code

Solutions copied from others or the internet will be considered violations of the honor code. Working with others on homework assignments and quizzes **in order to learn** is encouraged; **blindly copying** from others is grounds for expulsion from the University. Many solutions can be found online; please don't look for them (at the very least, don't do it until you have put substantial effort into figuring it out on your own). While tempting, it is never okay to just copy a solution without understanding. It is an honor code violation, and it teaches the student nothing. UVa is a community of trust; this course is based on that principle and relies on everyone acting honorably. If you feel that this trust is beached in any way, please bring it to the instructor's attention.

Conduct within the course

Full adherence to the University standards of conduct and Physics Department code of conduct, requested of all course participants, ensures a welcoming and inclusive environment for learning, intellectual and professional growth for all students.