

PHYS 308: Modern Physics

Planetary Hall 220, Tue+Thu 3:00-4:15 pm

<http://physics.gmu.edu/~pnikolic/PHYS308/>

Course Description

This course is an introductory survey of key developments in the 20th century physics that shaped the modern era of physics research and applications. Topics include: special and general theory of relativity; historic development and principles of quantum mechanics; the basics of: atomic, molecular and nuclear physics, quantum optics and lasers; solid state and condensed matter physics; elementary particles.

Prerequisite: PHYS 260

Course Textbooks

- *Modern physics for scientists and engineers* (second edition), J.Taylor, C.Zafiratos and M.A.Dubson, Prentice-Hall (2004).
- *Quantum physics of atoms, molecules, solids, nuclei, and particles* (second edition), R.Eisberg and R.Resnick, Wiley (1985)

Instructor

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Course web-site: <http://physics.gmu.edu/~pnikolic/PHYS308/>

Office Hours

Tue 4:15-5:15 pm

Grading

homework 20%, midterm exam 40%, final exam 40%

Exams

- Entirely based on problem solving. Practicing problems during the semester, in addition to learning and understanding all concepts, is the only known way to acquire the analytical skills needed to pass.
- The use of literature is not permitted (closed book).
- A scientific calculator is needed for quantitative problems. Phones, tablets, laptops, etc. are not allowed.
- Problems will be similar but different from those given in homework assignments. The final exam will cover topics from the entire course.
- It is the responsibility of each student to attend classes during scheduled examinations as listed in the syllabus regardless of work or family considerations. Make-up exams will be given only to students with a valid medical excuse and they should contact the instructor as soon as they return to school.

Homework

- Assigned once a week on Thursdays (posted on the course web-site).
- Due at the beginning (3pm) of the following week's Thursday class. Solutions will be published on the course web-site at due time, so late homework will earn reduced or no credit.
- Homework will be graded superficially, but completeness and clear evidence of independent effort to derive all final results are required to earn full credit.

Important dates

Jan 28: last day to add classes
Feb 05: last day to drop classes with 100% tuition refund
Feb 11: last day to drop classes with 50% tuition refund
Feb 12–24: unrestricted withdrawal period
Feb 25–Mar 30: selective withdrawal period (100% tuition liability)
Mar 02-06: APS March Meeting
Mar 09-15: spring break
May 04: Last day of classes

Class, homework and exam schedule (tentative)

Jan 21 Tue 1.
Jan 23 Thu 2. HOMEWORK 1 OUT
Jan 28 Tue 3.
Jan 30 Thu 4. HOMEWORK 1 IN, HOMEWORK 2 OUT
Feb 04 Tue 5.
Feb 06 Thu 6. HOMEWORK 2 IN, HOMEWORK 3 OUT
Feb 11 Tue 7.
Feb 13 Thu 8. HOMEWORK 3 IN, HOMEWORK 4 OUT
Feb 18 Tue 9.
Feb 20 Thu 10. HOMEWORK 4 IN, HOMEWORK 5 OUT
Feb 25 Tue 11.
Feb 27 Thu 12. HOMEWORK 5 IN, HOMEWORK 6 OUT
Mar 03 Tue 13. midterm review session
Mar 05 Thu 14. MIDTERM EXAM (in the regular class time)
Mar 10 Tue spring break
Mar 12 Thu spring break
Mar 17 Tue 15.
Mar 19 Thu 16. HOMEWORK 6 IN, HOMEWORK 7 OUT
Mar 24 Tue 17.
Mar 26 Thu 18. HOMEWORK 7 IN, HOMEWORK 8 OUT
Mar 31 Tue 19. IQM Meeting (possible lecture substitute)
Apr 02 Thu 20. HOMEWORK 8 IN, HOMEWORK 9 OUT
Apr 07 Tue 21.
Apr 09 Thu 22. HOMEWORK 9 IN, HOMEWORK 10 OUT
Apr 14 Tue 23.
Apr 16 Thu 24. HOMEWORK 10 IN
Apr 21 Tue 25.
Apr 23 Thu 26.
Apr 28 Tue 27.
Apr 30 Thu 28. final review session
May 07 Thu FINAL EXAM (in our classroom) ... 1:30 – 4:15 pm