

PHY142 - Second part of a demanding two-semester sequence for students with the strongest background, interests, and abilities in science and mathematics. The topics covered in PHY 142 are similar to those in PHY 132 but are treated in more depth in a small-class setting. Three lecture hours and one recitation hour per week. Advanced Placement Physics or a very strong course in high school Physics is recommended. Students may transfer to PHY 132 at any time during the first half of the semester without penalty. PHY 142 may not be taken for credit in addition to PHY 122, PHY 127, or PHY 132.

Prerequisite: C or higher in PHY 141 or permission of department

Pre- or Corequisite: MAT 132 or 142 or 127 or 171 or AMS 161; PHY 134

Objectives At the end of PHY142, the students will

- understand the main ideas and physics laws in Electricity and Magnetism, Waves and Optics as evidenced by their answers to conceptual questions often related to real-world situations;
- solve complex and diverse Electricity, Magnetism, Waves and Optics problems by:
 - recognizing the physical laws relevant to the problem,
 - applying the relevant laws to the problem,
 - using mathematical and computational techniques including Calculus, and
 - evaluating the possible limitations of their solutions.

Textbook Physics for Scientists & Engineers, 5th edition
Douglas C. Giancoli, Pearson Prentice Hall
PHY142 will cover chapters 15, 16 and 21 to 35, all the numbers included.
Students will need to have access to the Pearson's Mastering platform, used for weekly homework assignments. The Study Access Code students bought for PHY141 (or PHY126 or PHY131) will normally be valid for PHY142.

Instructor Prof. Emilio Mendez
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Lectures Mon., Wed., Fri. 11:00 am – 11:55 am Physics P128
First day of class: January 26
Last day of class: May 8
No classes the week of March 16 (Spring Recess)

Recitations Friday 12:30 pm – 1:25 pm Physics P128
Start on January 30

Office Hours Monday and Wednesday 9:30 am – 10:30 am Physics B142
Tuesday 10:30 am – 11:30 am

Homework Weekly assignments from Pearson's website MasteringPhysics.com
Due on Mondays at 11:59 pm

Evaluations Weekly quizzes during Recitations
Two mid-term exams (on or around February 27 and April 10)
Final exam (May 15).

Brightspace Used for course announcements, distribution of lecture material, and weekly homework assignments (via Brightspace-linked Pearson's Mastering)

Grades **Numerical grade**
10% Homework; 15% Quizzes
40% Midterm Exams (20% each); 35% Final Exam
5% Dynamic Study Modules (extra credit)
There is **No Curve Grading** in this course

Letter grade
 $100 \geq A \geq 90$ $89 \geq A^- \geq 85$
 $84 \geq B^+ \geq 80$ $79 \geq B \geq 75$ $74 \geq B^- \geq 70$
 $69 \geq C^+ \geq 65$ $64 \geq C \geq 55$ $54 \geq C^- \geq 50$
 $49 \geq D \geq 45$ $44 \geq F \geq 0$

Study Tips (Adapted from Giancoli, p. xviii)
Before class, read textbook sections to be covered in class; get familiar with vocabulary and notation. Do extra-credit Dynamic Study Module.
Attend all classes, both lectures and recitations. Watch recorded sessions if you couldn't come to class or would like to review some of the material.
After class, read textbook material covered in class, paying attention to main concepts, details and worked-out examples. Do homework problems corresponding to material covered that day in class.

Academic Integrity

Each student is accountable for all submitted work. Representing another person's work as your own is wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic integrity website at http://www.stonybrook.edu/commcms/academic_integrity/index.html .

Americans with Disabilities Act

If you have a physical, psychiatric/emotional, medical or learning disability that may impact on your ability to carry out assigned course work, you should contact the staff in the Disability Support Services office [DSS], ECC (Educational Communications Center) Building, Room 128, (631)632- 6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

<https://web.stonybrook.edu/newfaculty/StudentResources/Pages/DisabilitySupportServices.aspx>

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the website

<http://www.sunysb.edu/ehs/fire/disabilities.shtml> .

Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

Religious Observances

The academic calendar has no religious holidays. See the List of Religious and Other Holidays and other relevant links at

http://www.stonybrook.edu/commcms/provost/faculty/handbook/employment/list_of_religious_and_university_holidays#view-s2018

Students will be expected to notify the lecture- and/or recitation-instructor(s) by email, in advance, of their intention to be absent for any religious observance during the Spring 2024 semester. They can discuss with their instructor(s) before then how they will be able to secure the work covered.

Topics Covered in Depth in PHY142

1. Electric Charge and Electric Field
2. Gauss's Law
3. Electric Potential
4. Capacitance, Capacitors and Dielectrics
5. Electric Current and Resistance
6. DC Circuits
7. Magnetism
8. Sources of Magnetic Fields
9. Electromagnetic Induction
10. Inductance, EM Oscillations, AC Circuits
11. Maxwell's Equations
12. Waves
13. Sound Waves
14. Electromagnetic Waves
15. Interference and Diffraction
16. Ray Optics and Optical Instruments

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