

PHYS-2020-002: General Physics II

Syllabus — Spring 2025

Course ID: PHYS-2020-002
Lecture Times: M W F 11:40 a.m. – 12:35 p.m.
Lecture Location: Brown Hall, Room 370
Lecturer: Dr. Donald Luttermoser
Office Hours: By Appointment (280 Brown Hall, 439-7064)
Textbook: *College Physics, 11th Edition* by Serway & Vuille

Course Outline

<u>Days</u>	<u>Topics</u>	<u>Readings</u>
January 20	MLK Day – no class	
January 22, 24	I. Electric Forces & Electric Fields	Chapter 15
January 27, 29, 31	II. Electric Energy & Capacitance	Chapter 16
February 3, 5, 7	III. Current & Resistance	Chapter 17
February 10	Exam 1 (Sections I-III)	Chapters 15-17
February 12, 14	IV. Direct Current Circuits	Chapter 18
February 17, 19, 21	V. Magnetism	Chapter 19
February 24, 26, 28	VI. Induced Voltage and Inductance	Chapter 20
March 3	Exam 2 (Sections IV-VI)	Chapters 17-19
March 5, 7	VII. Vibrations & Waves	Chapter 13
March 10, 12, 14	VIII. Sound	Chapter 14
March 17, 19, 21	Spring Break – No Classes	
March 24, 26, 28	IX. Electromagnetic Radiation (Photons)	Chapter 21 (partial)
March 31, Apr 2, 4	X. Interaction of Photons with Matter	Chapter 28 (partial)
April 7	Exam 3 (Sections VII-X)	Chapters 21, 28, 22
April 9, 11	XI. Reflection & Refraction of Light	Chapter 22
April 14, 16	Refraction; XII. Mirrors & Lenses	Chapters 22, 23
April 18	Good Friday – No Class	
April 21, 23, 25	XIII. Wave Optics	Chapter 24
Apr 28, 30	XIV. Optical Instruments & Course Review	Chapter 25
May 5*	Final (3:50 p.m. – 5:50 p.m.)	Chapters 13-25, 28

★ — Note that the Final falls on Monday, May 5th at the time listed above. The Final covers the entire course.

For other university information, please consult the ETSU Syllabus Attachment at:

<https://www.etsu.edu/curriculum-innovation/syllabusattachment.php>

The web page for this course can be found at:

<https://faculty.etsu.edu/lutter/courses/phys2020/index.htm>

Overview

General Physics II is the second semester of a one-year sequence of courses in physics — a continuation of General Physics I. **Students should have already taken PHYS-2010 before taking this course.** Topics will include electricity, magnetism, wave motion, optics, atomic, and particle physics. The main goal of this course is to demonstrate to you how the nature operates. **General Physics II is a problem-solving course, that is, the measure of a student's progress is demonstrated by the ability to solve algebraic and trigonometric problems, and not just to quote facts, laws and formulas.** The assigned homework is designed to help you develop these skills, and the exams will test you on these skills. **It is assumed that you have a reasonable working knowledge of algebra and trigonometry at the General Physics I level.** Doing physics means doing story problems using mathematics! You are expected to have (*and know how to use*) a good *scientific* calculator — especially for the exams. The Department does not have calculators to loan, and the *sharing* of a calculator with your classmates on exams is **NOT** permitted! The book store sells such calculators. **CELL PHONES cannot be used as calculators in this course!**

On Campus Attendance is Required for this Course

You are required to attend class on campus in Brown Hall 370 this semester. **The exception to this is if you have been tested positive with COVID-19, or you are sick from some other infection.** In that case, then you can watch the lecture via Zoom. However, **YOU MUST COME TO CLASS IF YOU ARE NOT SICK!!!** You are to let me know ahead of time via email (lutter@etsu.edu) if you need to miss class due to illness.

Please note your professor is *immune-compromised* due to the medications he is taking. As such, keep your distance from me if you are sick. (Again, **do not come to class if you are sick!**)

For providing information to keep the ETSU community safe and communicating updates regarding policy changes, please visit the following web site:

<https://www.etsu.edu/coronavirus/>

Expected Learning Outcomes

General Physics II (PHYS-2020) is designed to be taken in tandem with General Physics II Lab (PHYS-2021), although students receive a separate grade for each. As with all of our departments physics and astronomy courses, we expect that students completing these courses will be able to:

- A.** Appreciate that physics is relevant to the real world and a useful tool for solving problems.
- B.** Develop the inclination and ability to apply problem solving techniques to simplify real world problems in terms of simple physics concepts, and to compute or estimate solutions.
- C.** Appreciate that any model or theory of a physical process stands or falls on the basis of experiment.
- D.** Recognize that all good experiments must include at least an estimate of their precision.
- E.** Recognize that scientific conclusions, whether yours or those from an outside source, may be incorrect, and develop the ability to check these conclusions with simple calculations, independent external references, and/or common sense.
- F.** Use mathematics to solve simple equations, and appreciate the dependencies of physical properties on each other.

More specifically, I expect that students completing this course will be able to:

1. Understand how electric and magnetic fields are created, and their relation to corresponding electric and magnetic forces.
2. Understand the relation of electric potential to electric potential energy.
3. Use Ohms Law and Kirchoffs Rules (and the physical intuition associated with fields and potential) to analyze basic circuits.
4. Understand the "right-hand rule" for magnetic fields and forces.
5. Know how to use Hooke's Law to model oscillating systems.
6. Understand pendulum motion and how it can be used to measure time.
7. Know the difference between traveling and standing waves.
8. Know the difference between transverse and longitudinal waves.
9. Learn how to calculate intensity levels for sound.
10. Understand how a spectrum is formed and the various types of spectra.
11. Understand all aspects of blackbody radiation.
12. Understand the various ways light can interact with matter.
13. Analyze basic optical systems consisting of lenses and mirrors using geometric optics.
14. Analyze thin slit and thin film interference, and diffraction patterns using wave optics.

D2L Course Website

For the past few years, I have been streaming the lectures in “real-time” so that students can attend lecture in a *remote* (*i.e.*, online) format and I will be recording these lectures. However, as mentioned above, **I expect all students to attend class on campus in Brown Hall 370 unless you are sick.** Prior to each scheduled lecture, I will be posting a Zoom link on the course D2L course web page that you are to use to access the synchronous lecture. **You are expected to attend each lecture, whether in person or synchronously via Zoom!** However, if you are forced to miss a lecture due to illness, each lecture will be recorded and the link for that recording will be pasted on the D2L course web page. A link to the ETSU D2L Login web page is included on the course web page at <https://faculty.etsu.edu/lutter/courses/phys2020/index.htm>.

Exams & Homework

There will be 3 exams throughout the semester, plus a comprehensive final on the dates listed on the first page of this syllabus. Each will cover material prior to the test and be taken during class time as shown in the table below. Each exam will be worth 20% and the final worth 30% of your course grade. The course grade will be based on your total homework score (10%), your total “in-class” exam scores (60%), and the comprehensive Final (30%). Note that all physical constants and formulae that you may require will be supplied on the exams. Otherwise, the exams are closed book and notes – you will not be allowed to consult any external written materials. An exception to this rule concerns the final. You will be allowed to bring one 8.5x11” sheet of paper to the final with anything you wish to write on it (“examples” might be a better idea than a grocery list) — you are allowed to write on both sides of the paper.

Exam	Note Sections	Textbook Chapters	Date Given
1	I, II, III	15, 16, 17	Monday, Feb 10, 2025
2	IV, V, VI	18, 19, 20	Monday, Mar 3, 2025
3	VII, VIII, IX, X	13, 14, 21, 28	Monday, Apr 7, 2025
Final	$\frac{1}{2}$ (XII–XIV) + $\frac{1}{2}$ (I–XI)	$\frac{1}{2}$ (23–25) + $\frac{1}{2}$ (13–22, 28)	Monday, May 5, 2025

Sickness and Make-Up Exams: **If you are sick, do not come to school!** If this occurs on exam day, you will be allowed to take a *make-up exam*. **However, contact me by email (preferably) or phone prior to a scheduled exam to let me know that you are sick.** The make-up exams are similar in structure to the in-class exams, though the questions will be different.

There will be 4 homework sets assigned throughout the semester composed of two sections of questions. The first section will be questions generated by the WebAssign software package (see

below). The second section of problems will not be graded and will have solutions posted on the course web page. Try to do these problems by yourself before retrieving the solutions from the web page. Doing both sections of questions will be a big help in studying for the in-class exams and Final Exam.

NO ONLINE HELP WEB PAGES are to be used for the homework, in-class exams, or final exam! Over the past few years, many students have been making use of various online companies to ‘**cheat**’. Please note that Dr. Luttermoser is familiar with these web sites and will be checking each of these sites to make sure none of the students in this class are making use of these sites to answer the questions/problems on the homework, exams, and final. Note that it is easy to verify this, even if a phony email address is used on these sites. Should a student be caught using such a site, your instructor will follow the steps laid out in the **Academic Integrity and Misconduct Policy** laid out below.

Extra Credit

Each exam will have a 5 point extra credit question on it (the final will have two 5 point questions). Roll will be taken occasionally during class. Regular attendance will be useful in obtaining a good grade in this class. Other than the extra credit problems on the exams, **no extra credit projects will be allowed, so don’t even ask.**

Cengage WebAssign Access

The assigned homework will make use of the textbook publisher’s *WebAssign* web site. You gain access to this site at:

<https://webassign.com> ,

then click on the “Enter Class Key” button on the upper right of this web page. The class key for this course is:

etsu 9516 9316

A Quick Start Guide for using this web site can be found on the course web page. Should you need additional assistance with *WebAssign*, you can contact **Technical Support** information at:

<https://webassign.com/support/student-support/>

via the web or

1-800-354-9706

by telephone.

Tutoring and Supplemental Help

Many students find General Physics I & II very challenging and have a difficult time understanding the principles of physics and solving physics problems. Mainly, this is due to a lack of training of logical thought skills during secondary school. Due to this, there are a variety of ways to get additional help with this course.

1. The Center for Academic Achievement offered by ETSU
(see <https://www.etsu.edu/students/learning/> on the web).
2. Assistance from the Professor via email or “by-appointment” office hours.
3. Tutorials on WebAssign. Besides the assigned homework, this web site will be available as additional help for students to provide experience solving word problems in physics.
4. Review sessions prior to each exam (date and times to be determined during lecture the week prior to the exam).

With these supplemental instruction options, students can gain valuable help with this difficult course.

Mental Health: Students often have questions about mental health resources, whether for themselves or a friend or family member. There are many resources available on the ETSU Campus, including: ETSU Counseling Center (423) 439-4841; ETSU Behavioral Health & Wellness Clinic (423) 439-7777; ETSU Community Counseling Clinic: (423) 439-4187.

- If you or a friend are in immediate crisis, call 911.
- Available 24 hours per day is the National Suicide Prevention Lifeline: 1-800-273-TALK (8255).

Students with Learning Disabilities

Over the years, I have had students in my courses who suffered with learning disabilities. I always offer additional support for such students, such as one-on-one tutoring and allowing additional time on the exams. However, in order to receive such additional support, a student needs to officially register with the **Office of Disability Services** (see <https://www.etsu.edu/students/ds/>). Once registered, this Office will provide paperwork to the affected student to give to the instructor of the course.

Cell Phone Policy

Please turn your cell phones off before coming into class! The ringing of cell phones often disrupts the class. Also, cell phones are not to be used during exams as mentioned in the Overview of this syllabus.

Grading

Your course grade will be determined from your performance on the 3 in-class Exams, the Final Exam, and the total score received on the assigned *WebAssign* homework problems. Many of the “full-length” problems you will get on the final will be modified versions of the example problems in the notes and textbook, and the supplemental and *WebAssign* homework problems. From these sources, you will have access to anywhere from 10 to 25 examples for each section of the notes. This should be more than sufficient to fill your need for studying for the Exams and Final. The grading system will be based by the following formula:

$$\text{Final Course Grade} = \left[0.20 * \left(\frac{\text{Exam 1}}{40} \right) + 0.20 * \left(\frac{\text{Exam 2}}{40} \right) + 0.20 * \left(\frac{\text{Exam 3}}{40} \right) + 0.30 * \left(\frac{\text{Final}}{80} \right) + 0.10 * \left(\frac{\text{Homework}}{\text{Homework Total}} \right) \right] * 100\%$$

The final course grades will be based on the following scale:

	A	=	90% or better	A–	=	88–89.9%		
B+	=	86–87.9%	B	=	76–85.9%	B–	=	73–75.9%
C+	=	70–72.9%	C	=	62–69.9%	C–	=	59–61.9%
D+	=	56–58.9%	D	=	50–55.9%			
	F	=	Less than 50%					

Academic Integrity and Misconduct Policy

Students are expected to abide by the ETSU Honor Code and to act with honor, integrity, and civility in all matters. The course instructor has the primary responsibility for maintenance of academic integrity. Students guilty of academic misconduct, either directly or indirectly, through participation or assistance, are immediately responsible to the course instructor. Any form of academic misconduct (plagiarism, cheating, etc.) is subject to disciplinary action. Sanctions for a violation may vary with the severity of the offense. The instructor may reduce a grade up to and including assignment of an F or a zero (0) for the exercise/examination or an F in the course. If a sanction is imposed then the instructor must begin the academic misconduct procedures and notify both the student and the Dean/Designee. Students may appeal a grade assignment associated with a finding of academic misconduct, as distinct from a student disciplinary or grade appeals process, through the Universitys Academic Misconduct Procedures. The student will not be subjected to any form of pressure to coerce admission of guilt or information about his/her conduct or that of others.