

PHY 1520/1620, Introductory Physics II, 4 Credit Hours
CRN: 11954 & 11955
Winter 2021, MWF 10:40 – 11:47am
Online Course

Instructor: Steffan Puwal, PhD
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Office: 186-D MSC

Office Hours: By appointment or by email

Textbook Serway, Raymond A. and John W. Jewett, Jr.
Principles of Physics: A calculus-based text. 5th edition. (Hybrid)
Purchase of this text from the bookstore should include access to the eBook and webAssign.
ISBN 9781285043074 [Required*]

Serway, Raymond A. and John W. Jewett, Jr.
Student Solutions Manual with Study Guide for "Principles of Physics". 5th edition. (Vol. 2)
ISBN 9781133110750 [Recommended, not Required]

Prerequisites: Introductory Physics I; Calculus II (recommended co-requisite)

Corequisites: PHY 1520 students are required to enroll in a section of lab.

Course Evaluation

Attendance Attendance is expected at all classes but is, in general, not part of your grade. However, frequent missing of classes can result in a lowering of your grade – particularly if you are also not doing the work that is required of you.

Homework Homework will use the online WebAssign system. Access to WebAssign should have been purchased with your textbook or can be purchased separately. Homework for each chapter will first be visible in the online system at 1:00 AM on the day before we start the chapter in class and will be due as follows...

Chapters 19 - 21	Due 11:59 PM	February 15, 2021
Chapters 22 - 25	Due 11:59 PM	April 2, 2021
Chapter 24	No WebAssign Homework	
Chapters 28, 30 - 31	No WebAssign Homework	

The webAssign system is set to allow you 5 tries on each problem and require your answer to come within $\pm 2\%$ of the correct answer.

My understanding is that you will continue to have access to the online materials, including the eBook with end of chapter problems, for as long as we continue to use this edition in the introductory classes. If you wish to have long term access to problems that you can study (for example for the MCAT or GRE Physics tests), I would strongly advise you to print those out as we go along.

Late homework cannot be accepted.

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webAssign Access

Registration

1. Go to www.webassign.net and click on “I have a class key”
2. Enter the (case sensitive) class key **TBD**
 - a. Please note, you must re-register for this semester’s course, even though you may have already done so in a prior semester.
3. Select your login name and enter the required information
4. Click on “Create my account”
 - a. A review screen appears with your information. **PRINT AND KEEP A COPY FOR YOUR RECORDS**
5. After login you will need to enter the webAssign access code
 - a. It is on the card inside the book (or purchased separately)
 - b. There is a 14 day grace period where you don’t need the code

Homework Access

1. Log into webAssign www.webassign.net/login.html
2. Click on “My Assignments”

NOTE: Clicking on “Save Work” will not submit your work for grading. Make sure you click on “Submit” when you finish your work. There is a maximum of 5 submissions for each problem.

Take-Home Quizzes

Ten (10) take home quizzes will be given out over the course of the semester (see lecture schedule below). The quizzes will consist of a few short problems and will be **DUE THE FOLLOWING MONDAY**. The quizzes will be uploaded to Moodle. You will only have to do five (5) of these.

Late quizzes cannot be accepted.

Exams

Three exams will be given over the course of the semester.

Exam 1	February 10, 2021	10:40 – 11:47 AM
Exam 2	March 29, 2021	10:40 – 11:47 AM
Final Exam	April 26, 2021	Noon – 2:00 PM

Exams will be completed through Moodle and MUST be completed during the scheduled class time. Extended testing time for DSS students will, of course, be available.

Labs

PHY 1520 students are required to enroll in a separate laboratory section. The instructor does not participate in the lab, so please refer all lab questions to your lab instructor.

*Supplemental
Instruction*

Supplemental Instruction is offered by the Tutoring Center. Attendance is not required, but students who attend SI sessions usually do better in introductory physics courses. Additional information about SI.

MW only Noon – 1:00 PM Online

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<i>Course Grade</i>	webAssign Homework	10% of your grade
	Take home quizzes	12% of your grade
	Exams	26% of your grade each

Grading Scale

Overall Percent Grade	Letter Grade	Numeric GPA Equivalent
≥95%	A	4.0
92%	A-	3.7
88%	B+	3.3
85%	B	3.0
80.5%	B-	2.7
74.5%	C+	2.3
70%	C	2.0
67%	C-	1.7
63%	D+	1.3
60%	D	1.0
<60%	F	0.0

About the Course

Course (Catalog) Description

Sound, light, electricity and magnetism. *Satisfies the university general education requirement in the knowledge applications integration area.*

General Education Learning Outcomes

This course satisfies the university general education requirement in the natural science and technology (NST) knowledge exploration area.

The learning outcomes for NST courses state that the student will demonstrate:

Knowledge of major concepts from natural science or technology, including developing and testing of hypotheses, drawing conclusions; and reporting of findings and some laboratory experience or an effective substitute.

How to evaluate sources of information in science and technology.

Course Goals and Objectives

As a mathematical science, physics involves a great deal of calculation. Just as important, the science of physics involves thinking critically, setting up the problem to be solved, discovering what aspects of the problem are important and which are negligible, and recognizing how a particular problem fits into a larger framework of laws that govern the universe. To that end, over the course of the semester we will learn about

Electromagnetic Forces	Electric and Magnetic Fields and Potentials
Electromagnetic Energy	Elementary Circuit Theory
Principles of Optics	The Nature of Light
Atomic Theory	Reflection, Refraction, and Diffraction of Light

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Academic Conduct Policy

Please consult the university's detailed policy for misconduct (cheating, plagiarism, falsifying data, cybercrime, etc.). This policy will be strictly followed, with no exceptions. Consequences may include expulsion from the university.

Add/Drops

It is your responsibility to make sure that you have filled out all necessary materials to be enrolled in the course. Further, it is your responsibility to make sure that you have filled out all necessary materials to drop the course and that you have done so by the deadlines specified by the university. Please contact the registrar if you are uncertain about adding or dropping a course.

Privacy

Student performance and grades are considered private and only to be discussed between the instructor, the student, and the university. The instructor, the department, and the university are prohibited from releasing a student's grade to anyone but the student.

Special Considerations

University policy is to make accommodations for individuals with disabilities. Please inform me of the need for accommodation within the first week of class.

Tentative Schedule

<u>Day</u>	<u>Date</u>	<u>Chapter</u>
W	1/6	<i>Introduction and Syllabus</i>
F	1/8	Ch 19 – Electric Forces and Electric Fields
M	1/11	Ch 19 – Electric Forces and Electric Fields
W	1/13	Ch 19 – Electric Forces and Electric Fields
F	1/15*	Ch 19 – Electric Forces and Electric Fields
M	1/18	<i>No Class; Martin Luther King, Jr. Recess</i>
W	1/20	Ch 20 – Electrical Potential and Capacitance
F	1/22*	Ch 20 – Electrical Potential and Capacitance
M	1/25	Ch 20 – Electrical Potential and Capacitance
W	1/27	Ch 20 – Electrical Potential and Capacitance
F	1/29*	Ch 21 – Current and Direct Current Circuits
M	2/1	Ch 21 – Current and Direct Current Circuits
W	2/3	Ch 21 – Current and Direct Current Circuits
F	2/5*	Ch 21 – Current and Direct Current Circuits
M	2/8	Review
W	2/10	EXAM (Ch 19 – 21 only)
F	2/12	Ch 22 – Magnetic Forces and Magnetic Fields

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M	2/15	Ch 22 – Magnetic Forces and Magnetic Fields
W	2/17	Ch 22 – Magnetic Forces and Magnetic Fields
F	2/19*	Ch 22 – Magnetic Forces and Magnetic Fields

Winter Recess

M	3/1	Ch 23 – Faraday’s Law and Inductance
W	3/3	Ch 23 – Faraday’s Law and Inductance
F	3/5*	Cardiac Electrophysiology and the EKG**
M	3/8	Ch 24 – Electromagnetic Waves
W	3/10	Ch 24 – Electromagnetic Waves
F	3/12*	Ch 25 – Reflection and Refraction of Light
M	3/15	Ch 25 – Reflection and Refraction of Light
W	3/17	Ch 27 – Wave Optics
F	3/19*	Ch 27 – Wave Optics
M	3/22	Ch 27 – Wave Optics
W	3/24	Catch-up Day
F	3/26	Review
M	3/29	EXAM (Ch 22 – 25, 27 only)
W	3/31	Ch 28 – Quantum Mechanics
F	4/2*	Ch 28 – Quantum Mechanics
M	4/5	Ch 28 – Quantum Mechanics
W	4/7	Ch 30 – Nuclear Physics (and 31.1 – 31.5 only)
F	4/9*	Ch 30 – Nuclear Physics (and 31.1 – 31.5 only)
M	4/12	Ch 30 – Nuclear Physics (and 31.1 – 31.5 only)
W	4/14	Ch 30 – Nuclear Physics (and 31.1 – 31.5 only)
F	4/16	Climate Science**
M	4/19	Review
M	4/26	Noon – 2:00 PM, FINAL EXAM (Ch 27 – 30 only)

*A take home quiz is distributed today, and is due the following Tuesday.

**This material will not be on the exams.

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Notes on the Class

What about lenses in Chapter 26: Image Formation by Mirrors and Lenses?

If you are enrolled in PHY 1520, you will complete a lab involving lenses, so you should maybe give a quick read through of the chapter before that lab. If you are a pre-med, it's safe to say the MCAT will have something on lenses or microscopes, so I would recommend going through this chapter before your test and while you are still in a physics frame of mind.

I'm a pre-med. Is this all I need to know for the MCAT?

Probably not. Physics covers topics from how planets move to why atoms exist. It is impossible to cover all there is to know about physics, or even all that is medically relevant in an introductory course. I'll try to point out, when I can, how certain concepts are important in biomedical science to help you focus your study. I know it's important, but please don't get caught up on studying for a standardized test; you're planning to be a doctor, so you're supposed to actually learn this stuff too.

How much calculus is required?

Calculus I is a required prerequisite and Calculus II is a recommended co-requisite, so I'm going to assume you can work with derivatives of a single variable, and that you have solved at least a few simple integrals. We will stress setting up the integrals and then consulting a standard table of solutions to solve some of the more complicated integrals.

How do I know if I'm keeping up?

- By the end of each week you should be able to
 - do all of the example problems in the text,
 - do all of the homework problems, and
 - do the problems in the take home quizzes (even if you chose to skip that week's take home quiz)up to and including the chapters we covered that week. Exam problems will be very much like the take home quiz problems (stressing the same concepts and formulas), so pay particular attention to the quizzes.
- If problems are taking you hours each to complete, you are struggling. In some cases a problem should take as little as 2 minutes to complete. In other cases it might take you 15 minutes. Keep in mind I will be asking you to do several problems in class during the two-hour exams, so these problems are not designed to take an hour each to complete.

What can I do to improve?

- Be organized. webAssign will only ask you for an answer, so keep a notebook with your work in it. Make sure it's neatly written so you can go back and follow your thought process. Write notes to yourself in your work. If you have to keep going back in the chapter to look up a formula or a concept, write that down with your work; and keep writing it down until you commit it to memory. And PLEASE WRITE NEATLY! I can't tell you where you're going wrong with a problem if I can't read your work.
- You are the best judge of your own weaknesses. If the use of a formula, or a section of a chapter is particularly confusing to you then try to do as many of those problems as you can. Skipping problems because you "just don't get it" is likely to lead you to fail the course.

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- Even though the in-text examples are worked out for you, try and work them out again without looking at the answer. Even though you already earned your homework points, do the webAssign problems again. The mathematical sciences (math and physics), unlike many other disciplines, are best learned by practice and NOT rote memorization.
- As you complete problems, it will be helpful if you would think about how you would phrase a similar but different problem. What information would you have to give to ask someone to solve for a particular quantity? If you can ask the problem, you can probably answer it. Think like a teacher!

Suggestions for other problems?

- Sometimes just hearing someone else discuss physics problems can help with your understanding. Students have told me that, for example, YouTube lectures, or Khan Academy lectures can be helpful. However, please do not have the attitude that “They couldn’t put it on the Internet if it wasn’t true”. You need to be careful of the resources you’re planning to use, and you should discuss them with me first.
- Our author has gone through the trouble to arrange a textbook and logically present material. Each chapter builds upon itself to help with your understanding. This is how the subject of physics is constructed, as well. You cannot simply go online and look up a random equation and understand what it means. That is the surest way to fail this course.
- MCAT and GRE Physics Subject test preparation guides can sometimes be a helpful source of additional problems. However, please be aware: The MCAT and GRE tests change regularly. Publishers print these preparation guides to make a quick profit and they’re notorious for being full of typos and errors. Schaum’s Outlines and Cliff’s Quick Review are also a useful source of additional problems.
- Each physics text presents material slightly differently, but all calculus based physics texts will have useful problems to practice with. Check with the library to see if there is an available introductory physics text by another author.