

**PHY 1020/1090 General Physics II**  
**CRN: 41832 & 41833**  
**Fall 2020, MWF Noon – 1:07 PM**  
**Classroom: online**

*Instructor:* Steffan Puwal, PhD  
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*Office:* 186-D MSC (formerly SEB)  
*Office Hours:* by appointment Thursdays and Fridays, 10AM – 3PM

*Textbook* Required:  
Serway/Vuille, College Physics, 11<sup>th</sup> edition, Hybrid – Cengage  
Bundled with EWA and EWA Start Guide  
ISBN: 9781337741569

\*You can purchase webAssign only; regardless of your purchase option webAssign comes with an eBook version of the text that includes end of chapter problems. Students cannot use the eBook on exam day (see the section on exams below).

*Prerequisites* PHY 1010/1080 or 1510/1610; strong math ability is necessary, equivalent to MTH 0662 or a score of  $\geq 22$  on the ACT or  $\geq 550$  on the SAT exam  
*Corequisite* PHY 1110 lab for PHY 1020 students only

About This Semester

Hello, all. Obviously, this semester will remain a bit unusual with the ongoing pandemic. Plans for the semester are subject to change according to health recommendations. Our course will make significant use of the Moodle system. Lectures will be pre-recorded to provide some flexibility of when you watch them. However, exams **must** be taken during the scheduled class time.

Course Evaluation

*Recorded Lectures* You have to watch the lectures. Yes, really.

*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 12:00 AM on the day before we start the chapter in class and will be due as follows...

**Chapters 15 - 17      Due October 19, 2020      11:59 PM**

**Chapters 18 – 20, 22      Due November 16, 2020      11:59 PM**

**Chapters 24      Due December 12, 2020      11:59 PM**

**No webAssign homework is assigned for chapter 21 or beyond chapter 24.**

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

If you wish to have 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](http://www.webassign.net) and click on "I have a class key"
2. Enter the (case sensitive) class key **TBD**
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](http://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 3 submissions for each problem.

*Take-Home Quizzes*

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 CLASS MEETING**. The quizzes and answer keys will be on Moodle. You will only have to do five (5) of these. You may do up to 6 quizzes and I will base your grade on the best 5 scores.

Late quizzes cannot be accepted.

*Labs*

PHY 1020 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.

*Exams*

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

<b>Exam 1</b>	<b>October 14, 2020</b>	<b>Noon – 1:07 PM</b>
<b>Exam 2</b>	<b>November 13, 2020</b>	<b>Noon – 1:07 PM</b>
<b>Final Exam</b>	<b>December 12, 2020</b>	<b>Noon – 1:20 PM</b>

Missing an exam will require a note from a physician or from the military detailing the reason for absence. I will not give a make-up exam for any other reason. You must inform me of the need for a make-up exam within 24 hours after the exam – preferably much sooner.

You will be permitted to make a formula sheet for the exam. It must be handwritten on standard 8.5" x 11" paper, using the front and back of the paper. You can put anything you want on it (example problems, formulas, figures, etc.). Each exam can use a new formula sheet plus all previous sheets.

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Near the end of the exams, you will be permitted to look in your textbooks for 5 minutes. This is intended to help if you forgot a formula, but it doesn't really give you enough time to learn something you don't already know. Only hard copies of the textbook can be used for this purpose; eBook versions of our text cannot be used during the exam.

<i>Course Grade</i>	webAssign Homework	10% of your grade
	Take home quizzes	10% of your grade
	3 Exams	26% of your grade, each
	Semester Project	2% of your grade

This semester we have started using a letter grade for courses. The Registrar will not be converting previous course grades, so your transcripts will be a mix of letter and numeric grades. The Registrar has assigned a numeric GPA equivalent to each letter grade and will still be calculating an overall numeric GPA for you.

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

This is a linear grading scale. To convert an Overall Percent Grade into a numeric GPA using a linear grading scale in the 2.x range, for example,

$$GPA = 2.0 + \frac{\text{Overall Percent Grade} - 70\%}{85\% - 70\%}$$

Supplemental Instruction

Supplemental instruction is a group tutor service offered by the Academic Skills Center. You do not have to attend, but you are encouraged to do so.

Meeting Times: 2:40 – 3:40 PM  
 Classroom: Online

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### About the Course

#### *Course (Catalog) Description*

*Electricity and magnetism, light, relativity, atomic and nuclear physics.* Satisfies the university general education requirement in the knowledge applications integration area. Prerequisite for knowledge applications integration: completion of the general education requirement in the natural science and technology knowledge exploration 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

- Electric and magnetic fields
- Capacitors and resistors
- Simple electrical circuits
- Light
- Wave-particle duality
- Optics
- Quantum mechanics
- Atoms and the Periodic Table
- Radiation and nuclear decay

#### *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 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.

#### *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.

#### *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.

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**Tentative Schedule**

<u>Day</u>	<u>Date</u>	<u>Chapter</u>
F	9/4	<i>Introduction</i>
M	9/7	Labor Day Recess
W	9/9	Vectors & Unit Vectors Review
F	9/11	* Vectors & Unit Vectors Review
M	9/14	Ch 15 – Electric Forces and Electric Fields
W	9/16	Ch 15 – Electric Forces and Electric Fields
F	9/18	* Ch 15 – Electric Forces and Electric Fields
M	9/21	Ch 16 – Electrical Energy and Capacitance
W	9/23	Ch 16 – Electrical Energy and Capacitance
F	9/25	* Ch 17 – Current and Resistance
M	9/28	Ch 17 – Current and Resistance
W	9/30	Ch 17 – Current and Resistance
F	10/2	* Ch 18 – Direct-Current Circuits
M	10/5	Ch 18 – Direct Current Circuits
W	10/7	Ch 18 – Direct Current Circuits
F	10/9	* Catch-up Day; Semester Project
M	10/12	Review
<b>W</b>	<b>10/14</b>	<b>EXAM 1 (Chs 15 – 18 only)</b>
F	10/16	Fall Recess
M	10/19	Ch 19 – Magnetism
W	10/21	Ch 19 – Magnetism
F	10/23	* Ch 20 – Induced Voltages and Inductance
M	10/26	Ch 20 – Induced Voltages and Inductance & Cardiac Electrophysiology and the EKG**
W	10/28	Ch 21 – Electromagnetic Waves (Section 21.8 – 21.13 Only)
F	10/30	* Ch 21 – Electromagnetic Waves (Section 21.8 – 21.13 Only)
M	11/2	Ch 22 – Reflection and Refraction of Light
W	11/4	Ch 22 – Reflection and Refraction of Light
F	11/6	* Ch 24 – Wave Optics
M	11/9	Ch 24 – Wave Optics; Ch 25 – Optical Instruments (Section 25.6 Only)
W	11/11	Review
<b>F</b>	<b>11/13</b>	<b>EXAM 2 (Chs 19 – 22, and 24 only)</b>
M	11/16	Ch 27 – Quantum Mechanics
W	11/18	Ch 27 – Quantum Mechanics
F	11/20	* Ch 27 – Quantum Mechanics

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M	11/23	*	Ch 29 – Nuclear Physics / Ch 30 – Nuclear Energy (Section 30.1 – 30.4 Only)
W	11/25		No Class – Thanksgiving Recess
F	11/27		No Class – Thanksgiving Recess
M	11/30		Ch 29/30 Nuclear Physics/ Nuclear Energy
W	12/2		Ch 29/30 Nuclear Physics/ Nuclear Energy
F	12/4		Ch 29/30 Nuclear Physics/ Nuclear Energy
M	12/7		Review Climate Science Demo**

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

\*\*Optional to view these lectures. They will not be specifically covered on the exams.

<b>M</b>	<b>12/14</b>	<b>Noon – 1:20 PM</b>	<b>FINAL EXAM (Chs 24, 25.6, 27 &amp; 29, and Sec 30.1 – 30.4 only)</b>
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Note: The Academic Calendar says the final exam will be Noon – 3 PM; however, because the final is not cumulative and is equally weighted with the other exams, I want it to be about the same duration. So the final exam will be Noon – 1:20 PM.

### Notes about the Class

#### *What about Chapter 23: Mirrors and Lenses?*

If you are enrolled in PHY 1020, 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 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 these problems.

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- 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 one-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.
- 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.
- Pay particular attention to problems you are struggling with. It makes little sense to practice problems that you already fully understand.
- You are the best judge of where you need help. When you seek assistance, try to at least identify the section of the text that you are finding difficult. This can help narrow down where the problem is.
- IMPORTANTLY, never wait until several chapters have gone by before you seek help. Physics and math build upon earlier topics to discuss more advanced topics. If you are a little lost in chapter 15, you will be very lost by the time we get to chapter 20.
- 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.
- Because this is a non-calculus based section, we won't do too much with deriving equations. Many of the problems will ask you to take an equation involving several variables, plug in the quantities that you know/are given, and then solve for the unknown quantity. Because most of you do not have a calculus background, you likely do not have significant practice with mathematics courses. I strongly encourage you to review order of operations, how to solve an equation for the unknown quantity, basic geometry, trigonometry, vectors, and how to cancel units of measurement in a formula.

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- Some of the most common mistakes students make in introductory physics classes involve the misuse of their calculators. Again, review order of operations, make generous use of parentheses with your calculator, and make sure your calculator is in degree or radian mode when you need it to be in degree or radian mode. Sine of 25 degrees is very different than sine of 25 radians!

*Also...*

- Please check the syllabus and Moodle to see if your question has already been answered before you email your instructor.
- Office hours are office hours, not private tutoring. Please be mindful of the need of other students for my attention.
- Email me directly. Do not use Moodle or webAssign to send me messages.
- Read your email!