PHY 1510/1610, Introductory Physics I, 4 credits
CRN: 45340 & 45341
Fall 2020, MWF 8:00 – 9:07 am
Classroom: online

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

Textbook   Serway, Raymond A. and John W. Jewett, Jr. *Principles of Physics: A calculus-based text*. 5th edition. (Hybrid)   ISBN 128 504 3073 [Required*]
Purchase of this text from the bookstore should include access to the eBook and webAssign.

Serway, Raymond A. and John W. Jewett, Jr. *Student Solutions Manual with Study Guide for "Principles of Physics"*. 5th edition. (Vol. 1)
ISBN 113 311 0762 [Recommended, not Required]

*You can purchase webAssign only, since webAssign comes with an eBook version of the text.

IMPORTANT NOTE: Do not purchase your textbook from an online retailer. You will still be required to purchase webAssign separately, and separate purchase makes this the more expensive option.

Prerequisites   MTH 1554 Calculus I, required; MTH 1555 Calculus II, recommended corequisite

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 1 – 5   DUE 11:59 PM October 7, 2020
Chapters 6 – 10   DUE 11:59 PM November 9, 2020
Chapters 11 – 13, 15 – 17   DUE 11:59 PM December 9, 2020
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.

My understanding is that you will 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 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.

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**
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 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**. You must show up to class to get the quiz. You will only have to do five (5) of these.

Late quizzes cannot be accepted.

Labs   PHY 1510 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.

Exam 1	**Monday, October 5**	**8:00 – 9:07 AM**
Exam 2	**Wednesday, November 4**	**8:00 – 9:07 AM**
Final Exam	**Wednesday, December 9**	**9:30 – 11:00 AM**

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.

Course Grade	webAssign Homework	10% of your grade
	Take Home Quizzes	10% of your grade
	Three Exams	26% of your grade, each
	Semester Project	2% of your grade

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

Supplemental Instruction

Supplemental instruction is a group tutor service offered by the Academic Skills Center. There is currently no SI session scheduled to accompany this class.

Meeting Times:	Noon – 12:55 PM
Classroom:	Online

About the Course

Course (Catalog) Description
Classical mechanics and thermodynamics. For science, mathematics and engineering students. Students must attend three general education laboratory sessions during the semester.

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

Fundamental units of measurement
Vector algebra
Setting up a system of coordinates and analyzing motion (Newtonian mechanics)
How energy and conservation of energy can be used to analyze a problem
Interactions such as collisions
Gravity and the motion of planets (the physics of the very large)
Atoms and atomic spectra (the physics of the very small)
The spring and the pendulum (important prototype systems)
Rotating systems
Waves and oscillating systems
Temperature and heat
The laws of thermodynamics and measures of engine efficiency

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.

Tentative Schedule

Date			Chapter	
F	9/4		-	Syllabus and Introduction
M	9/7		-	No Class; Labor Day
W	9/9		1	Introduction and Vectors
F	9/11	*	1	Introduction and Vectors
M	9/14		2	Motion in One Dimension
W	9/16		2	Motion in One Dimension
F	9/18	*	3	Motion in Two Dimensions
M	9/21		3	Motion in Two Dimensions
W	9/23		4	The Laws of Motion
F	9/25	*	4	The Laws of Motion

M	9/28		5	More Applications of Newton's Laws
W	9/30		5	More Applications of Newton's Laws
F	10/2		-	REVIEW & Semester Project
M	**10/5**		**-**	**EXAM 1 (Chapters 1 – 5 Only)**
W	10/7		6	Energy of a System
F	10/9	*	6	Energy of a System
M	10/12		7	Conservation of Energy
W	10/14	*	7	Conservation of Energy
F	10/16		-	Fall Recess; No Class
M	10/19		8	Momentum and Collisions
W	10/21		8	Momentum and Collisions
F	10/23	*	8/10	Rotational Motion
M	10/26		10	Rotational Motion
W	10/28		10	Rotational Motion
F	10/30	*	11	Gravity, Planetary Orbits, and the Hydrogen Atom (11.1 – 11.4 only)
M	11/2		11	Gravity, Planetary Orbits, and the Hydrogen Atom (11.1 – 11.4 only)
W	**11/4**		**-**	**EXAM 2 (Chapters 6 – 10 only)**
F	11/6	*	12	Oscillatory Motion
M	11/9		12	Oscillatory Motion
W	11/11		13	Mechanical Waves
F	11/13	*	13	Mechanical Waves
M	11/16		15	Fluid Mechanics (Fluid Statics 15.1 – 15.5 only)
W	11/18		15	Fluid Mechanics (Fluid Statics 15.1 – 15.5 only)
F	11/20	*	16	Temperature and the Kinetic Theory of Gases
M	11/23		16	Temperature and the Kinetic Theory of Gases
W	11/25		-	No Class; Thanksgiving Recess
F	11/27		-	No Class; Thanksgiving Recess
M	11/30	*	16/17	Energy in Thermal Processes: The First Law of Thermodynamics
W	12/2		17	Energy in Thermal Processes: The First Law of Thermodynamics
F	12/4		17	Energy in Thermal Processes: The First Law of Thermodynamics
				The Second Law of Thermodynamics
M	12/7		-	Review
W	**12/9**		**9:30 – 11 AM**	**FINAL EXAM (Chapters 11 - 13, 15 - 17 only)**

*Take-home quiz will be given out today. This is due by the next class meeting.

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Notes for how to succeed in the course:

How do I know if I'm keeping up?

- By the end of each week you should be able to
  - do all of the problems we did in class
  - 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.

- Unless specifically noted by the instructor, if a topic wasn't covered on a quiz then the topic will not be on the exams. So the quizzes should help you to focus your studying.
  - Note that quiz questions tend to be more like a simple math problem. Exam questions will be more involved.

- If problems are taking you hours each to complete, you <u>are</u> 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 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 1, you will be very lost by the time we get to chapter 10.

- 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.

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.

- In the summer, it is difficult for the university to arrange for Supplemental Instruction (SI) to accompany our class. However, the Tutoring Center (a.k.a. the Academic Skills Center) is still operational and will help with one-on-one tutoring.

- 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.