

# Principles of Physics II Syllabus

## 1 Professor contact information

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## 2 Course Description

Welcome to Principles of Physics II! This course is the second semester of a two-semester sequence that presents an intermediate, calculus-based introduction to physics. The first semester will cover ideas like kinematics, Newton's laws, conservation of energy, rotational motion, and thermodynamics. The second semester will cover electricity and magnetism, waves/optics, and relativity. We will develop a conceptual understanding of the laws of physics, and use these laws to describe a wide range of physical phenomena.

In addition to these physics-specific goals, this course will develop skills that will serve you well in your career. A particularly vital one is the ability to reason through complex problems using basic principles or physical models. Solving problems and mastering concepts are closely linked; only after you have mastered the underlying physical concepts and principles will you be able to apply them effectively to solve problems.

## 3 Course Prerequisites

Students should have taken Calculus 1. Other prerequisites for PHYS 101 are high school algebra, geometry, and trigonometry.

## 4 Text and Course Supplies

The standard set of materials for the two-semester sequence (PHYS 101/102) is as follows

- Physics for Scientists and Engineers: A Strategic Approach with Modern Physics (3rd Edition) by Randall D. Knight
- A subscription to MasteringPhysics the online homework service associated with Knight's book.
- A clicker in order to participate in class questions. Most days, questions will be asked of you which involve your input. The clicker is an easy way to collect anonymous answers from the class.

## 5 Course Web Page

Canvas will host the course web pages for this course. Almost all the information that you will need for this course (i.e., syllabus, homework schedule, web links to homework solutions and computer programs for certain homework assignments, how to find/contact your professor, announcements, etc.) will be placed on this website. Familiarize yourself with the course website; it will come in handy

## 6 Course Philosophy

This course may be different than other physics courses you have taken in the past. In the same way that you cannot learn basketball by watching a video on basketball, you cannot learn physics by simply listening to someone lecture on physics. This is a well-documented fact based upon years of research by the physics education community. You must play an active role in your learning. The various components of the course will be discussed in section ???. Here we want to give you an overview and a successful strategy for doing well in the course.

- **Before each class, actively read the chapter assigned for that class period**
  - **What does “active” reading entail?**

A good analogy would be an apprentice learning a trade from a master. As you read a chapter, if you don't understand something, ask! The answer should be there in the text and there are exercises (with solutions) and worked examples to help you find it. The more you can figure out what the author is saying, the more the knowledge becomes your own. Anyone can passively read a physics textbook, but to really understand what you have read, you have to own the knowledge. This type of reading is called “active reading.” Developing this skill will help you in whatever career you choose—active reading is the sight equivalent of active listening, which was listed as an essential skill for getting a good job. You may not believe this right now, but this is the most important thing you can do to earn a good grade in the course.
- **Go to all of your lectures and recitation sessions and ask questions!**
  - You will get much more out of lecture and recitation if you ask questions rather than just sitting there passively. This is the time to get questions answered that you were unable to answer yourself.
- **Make a serious attempt at all of the homework problems assigned.**
  - You will be given 3 attempts at each on-line homework problem (see section ???). Make a serious attempt to answer the question on the first try. Avoid the temptation to see the solution first. Why? Because you will be given only one attempt at each exam problem.

## **7 Course Components (with percentage of course grade in italics)**

### **7.1 Clicker Questions**

We will cover close to one chapter a day. You are responsible for reading the chapter before coming to class. In addition to reading the text, you should work the exercises that are embedded in the reading to help reinforce the concepts and check your understanding.

Clicker questions will be asked most every day. They will mostly cover concepts related to the material although sometimes they will require simple math. It is absolutely essential to your success in the course and to the success of the course itself that you keep up with the reading assignments. Class sessions will make little sense if you fail to do so. The results of these questions will indicate possible areas of confusion for the class, and they will help guide classroom discussion. Remember, unlike perhaps other large lecture courses, class time in PHYS 101 is a key time for you to ask questions!

### **7.2 Attendance/Participation (*10%*)**

Attending all lectures and recitations is integral for a summer course. Because the pace is fast, and there is no slowing down, attending all lectures and recitations is required. There will be no make-up recitations except in extenuating circumstances. Excused absences will be considered only under exceptional circumstances such as serious illnesses, off-campus, university-sanctioned activities, or certain legal obligations, such as jury duty.

There are 25 classes during this session. If you miss a class without an excuse, your attendance grade will be decreased 4%. If you are late to class, your grade will be docked in accordance with how late you are.

### **7.3 Homework Assignments (*15%*)**

The Modified MasteringPhysics system will be used for the majority of homework problems this semester. You need a registration access number to use the system (see section ??). All homework must be submitted according to the MasteringPhysics schedule. You will be given three attempts to answer each part to a problem. For every incorrect submission, you will lose 20% of credit for that part. After your third attempt, you can no longer receive credit for that part. Your lowest two homework assignment grades will be dropped.

If you feel like something has been graded in error on your MasteringPhysics, you may submit a MasteringPhysics regrade request using the Google sheet which can be found on the Canvas site. You will have 24 hours from submitting your answers to submit a regrade request. No regrade requests will be accepted after this time for any reason.

### **7.4 Recitation sessions (*15%*)**

Recitation attendance is required twice each week. During this time, students will complete a few problems covering relevant material from the past week. These problems in recitation will not be collected for a grade. Working in small groups is encouraged for the recitation

section. You will then have a couple problems to work at home to be submitted during the first meeting of your recitation the next week. For MW recitation people, your homework will be due on Mondays unless otherwise noted. For TTh recitation people, your homework will be due on Tuesdays unless otherwise noted. No recitation grades will be dropped. Absences from recitation will result in a 0 for that grade.

If you feel like something has been graded in error on your recitation homework, you may submit a recitation regrade request using the Google sheet which can be found on the Canvas site. You will have 24 hours from receiving your homework back to submit a regrade request. No regrade requests will be accepted after this time for any reason.

## **7.5 Exams (60% )**

There will be 5 exams on the dates shown in the course schedule. Exams will be cumulative in that physics builds upon itself, but not cumulative in that questions from the first test would be explicitly on the test. Some sections may be explicitly excluded as indicated by your professor closer to the final exam.

If you feel like something has been graded in error on your exam, you may submit an exam regrade request using the Google sheet which can be found on the Canvas site. You will have 24 hours from receiving your exam back to submit a regrade request. No regrade requests will be accepted after this time for any reason.

### **7.5.1 Materials to Bring to the Exams**

You will need writing implements (pens or pencils), an eraser, and a calculator for each exam. Check your calculator batteries before you come to exams. I do not have spare calculators. If your calculator cannot function during the test, you must complete the test without a calculator.

## **8 Attendance and Other Course Policies**

### **8.1 Attendance**

Attendance to lecture and recitation sessions is mandatory. Attendance will be taken in all of these components. Because of the fast pace of summer courses, even missing a single lecture can set you back significantly.

### **8.2 Homework**

Late homework is not accepted. Your 2 lowest scores will be dropped.

### **8.3 Recitation Sessions**

Attendance at the weekly recitation sessions is mandatory. Problems will be assigned, completed, and submitted as part of your course grade. Absences from recitation will result in a 0 for that grade.

## 8.4 Makeup Exams

Makeup exams are a great inconvenience for everyone, and they will be considered only under exceptional circumstances such as serious illnesses, off-campus, university-sanctioned activities, or certain legal obligations, such as jury duty. Except in emergency situations, arrangements for makeup exams need to be made prior to the regularly scheduled exam. If an unexpected emergency prevents you from taking the exam, notify your instructor as soon as possible.

## 9 Course Grades

Your final grade in PHYS 101 is determined from a weighted average of your recitation session attendance and problems (R, 15%), homework (H, 15%), attendance (A, 10%), and five exams (E, 60% total, with each exam weighted equally). You can calculate your course percentage from the following equation, where each letter corresponds to your percentage in that component of the course:

$$\text{Course Percentage} = 10*A + 15*H + 15*R + 12*E1 + 12*E2 + 12*E3 + 12*E4 + 12*E5$$

Grading Scale:

A Range	90 and above
B Range	80-89.9
C Range	70-79.9
D Range	60-69.9
F	below 59.9

The instructor reserves the right to lower the borderline percentages, but will never raise them.

## 10 Academic Integrity

Physics as practiced in real life is often a collaborative exercise. Students are therefore permitted and encouraged to work with classmates on homework to stimulate their own thought processes and to receive feedback from their peers on possible misconceptions. However, the written work that you submit should be yours alone – actual or effective Xerox copies of written work are not permitted.

Cheating on exams and copying homework are serious offenses. Any suspected cases of cheating/plagiarism will be reported and dealt with according to the rules specified by the Honor System.

Most academic integrity violations are simply incorrect choices made when students are stressed out, sleep deprived, and facing numerous deadlines. Keep this mind: it takes only a brief moment to make a bad decision, but it takes far longer to earn back the trust of instructors, advisors, and friends. Further, an academic integrity violation will follow you

for years, even after you leave the university to seek your first job or professional degree. Rather than making a poor choice, take control of the situation by talking to your instructor or a counselor beforehand, especially if external pressures (roommate troubles, relationship issues, depression, etc.) are involved. Remember, Georgetown faculty take very seriously the Jesuit educational principle of *Cura Personalis* (care for the whole person).

## 11 Cell phones and laptops

We don't want to hear cell phones or other electronic devices. Turn them off before class or at least set them on silent mode. It is very unfair to other students to have your personal affairs interfering with their education.

Laptops are distracting to you and to students around you. You are best served by leaving them at home or in your backpack, but we understand some of you may occasionally need to use your laptop during lecture. Out of consideration for your fellow students, please only use laptops in the back third of the classroom, preferably only in the last few rows.

## 12 Sexual Misconduct

Georgetown University and its faculty are committed to supporting survivors of sexual misconduct, including relationship violence, sexual harassment and sexual assault. University policy requires faculty members to report any disclosures about sexual misconduct to the Title IX Coordinator, whose role is to coordinate the University's response to sexual misconduct.

Georgetown has a number of fully confidential professional resources who can provide support and assistance to survivors of sexual assault and other forms of sexual misconduct. These resources include:

Jen Schweer, MA, LPC

Associate Director of Health Education Services for Sexual Assault Response and Prevention

(202) 687-0323

jls242@georgetown.edu

Erica Shirley, Trauma Specialist

Counseling and Psychiatric Services (CAPS)

(202) 687-6985

els54@georgetown.edu

More information about campus resources and reporting sexual misconduct can be found at <http://sexualassault.georgetown.edu>.

## 13 Calendar of the session

Day	Topic	Read	Recitation
7/10	Waves	Ch 20	Waves
7/11	Superposition	Ch 21	Waves
7/12	Wave Optics	Ch 22	Optics
7/13	Ray Optics	Ch 23	Optics
7/14	<b>Exam 1</b>	N/A	N/A
7/17	Electric Charges	Ch 25	Electric Field
7/18	Electric Field	Ch 26.1-5	Electric Field
7/19	Dipole/Flux	Ch 26.6-27.3	Gauss' Law
7/20	Gauss' Law	Ch 27.4-6	Gauss' Law
7/21	<b>Exam 2</b>	N/A	N/A
7/24	Potential	Ch 28	Potential
7/25	Potential and Field	Ch 29	Potential
7/26	Current	Ch 30	Circuits
7/27	Circuits	Ch 31	Circuits
7/28	<b>Exam 3</b>	N/A	N/A
7/31	Biot-Savart	Ch 32.1-5	Biot-Savart
8/1	Ampere's Law	Ch 32.6-9	Biot-Savart
8/2	Induction	Ch 33	Induction
8/3	E&M Waves	Ch 34	Induction
8/4	<b>Exam 4</b>	N/A	N/A
8/7	Bohr Atom	Ch 38(37)	Electronic Structure
8/8	Atoms	Ch 41	Electronic Structure
8/9	Radioactivity	Ch 42	Radioactivity
8/10	Radioactivity Pt. 2	N/A	Radioactivity
8/11	<b>Exam 5</b>	N/A	N/A