

Syllabus – General Physics (PHYS 202)

Section A: Temporary Building 3B, MWF 9:00-9:50

Section B: Business Center 305, MWF 10:00-10:50

Instructor:

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Office hours: Mondays and Fridays 1:00 p.m. - 3:00 p.m. and
by appointment (send email)

Required Textbook:

Introductory Physics, Building Understanding

J. Touger , Wiley

Optional Textbooks:

R. Feynman, The Feynman Lectures on Physics - Volume II (The Electromagnetic Field),
Addison Wesley (a little advanced but wonderful reading)

Prerequisites:

General Physics I (PHYS 201)

Grading Scheme:

Homework 5%

First Exam 25 %

Midterm Exams 25%

Final Exam 30%

Project 15 %

This is the 100 % distribution for the theory class, the final grade will take in consideration your work in the laboratory part of the course that has a value of 25 % of the total grade.

Introduction

This is a one-semester course on the laws and phenomena of electricity, magnetism, electromagnetic waves and optics. It is the continuation of PHYS 201 and will build upon that course. Topics to be covered include:

- fundamental building blocks of matter, electric charges and the forces between them
- electrostatic fields and potentials
- currents, resistance and EMF
- sources and effects of magnetic fields
- electromagnetic induction
- simple devices like capacitors, inductors, resistors, batteries, etc.
- DC and AC circuits
- electromagnetic waves
- geometrical optics (mirrors, lenses and prisms)
- optical diffraction (slits, gratings and thin films).

The purpose of this course is to introduce you to some fundamental concepts of Physics. Electromagnetism is the most-developed theory of a fundamental interaction (and confirmed with the highest precision). Practically all everyday phenomena can be ultimately explained by some law(s) of Electromagnetism. Our goal will be to introduce and gain an understanding of the underlying, unifying concepts like electric and magnetic fields. We will see that only a few concepts (and equations) can explain a huge number of observations. We will discuss some practical applications as illustrations, but the emphasis is on the conceptual foundation.

It is important for you to strive for an **active** understanding right from the beginning. This means that you should not just memorize the equations, but apply your new knowledge to solve problems. For that reason, it is very important that you do the homework problems (apart from their contribution to the final grade) and attend the recitation sections (where more detailed examples can be treated than in the lecture). Since physics is a science based on observations it is also very important to do the laboratory experiments and to be well prepared for them.

Exams

We are going to have 3 exams with 2 components: a take home part and in class part. Please be careful not to collaborate with your classmates or anybody else when you work on your take home exams.

Homework

Doing the homework problems is **very** important (it is also a good way to study for the exams). The problems must be turned in online via [WebAssign](#) - they will be due before midnight of the "due date". You can work on each **assignment** (**not** on each individual problem!) up to 5 times, so it is important not to wait until the last minute to do the assignments. Make sure you work the whole assignment on paper first (using Algebra all the way until the very end) and only then log in to WebAssign. Be aware that the numerical constants (and maybe the wording) of the online problems are different from the version in the textbook(s), so you will need to redo your math with all correct input values. Your submission will be graded instantly, and you will get feedback whether you did everything correctly. You can then improve on your answers (the whole *assignment at once!*) - *your **last** submission will determine your final homework grade.*

Project

The project is a research paper of 5 pages length on subject that is related to the topics covered in class. Please send me a title and an abstract for approval. Typical topics are biographies of the scientists that worked on the subject of electromagnetism with particular emphasis on details of their contribution Physics rather than particular life events, electromagnetism relevance to your particular field of study, any details study of application of electromagnetism to everyday life, etc.

Recitations

We will have few homework sessions (hopefully once a week) to work problems together.

Please come prepared with problems that you are not sure how to solve. Don't be afraid to ask any question at all.

We are setting up a room in Kaufmann for student to meet and work problems together or with the help of any available faculty or senior student.

Students are encouraged to use the room to work together on their assignments, even when a physics staff member is not available for tutoring.

Student with special needs

Please let me know if you need any assistance if you have a special need for accommodations.