

PHYS 206 – General Physics IV

Semester: Spring 2014
Lecture Hours: TuTh B4 (14:00-15:15)
Room: SOS B08

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Off. Hr.: Tu B5 15:30 – 16:45 or by
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Off. Hr.: Mo B4 14:00 – 15:15 or by
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Course Description: The nature and propagation of light, geometric optics and optical instruments, interference, diffraction, relativity, photons electrons and atoms, the wave nature of particles, quantum mechanics, atomic structure, molecules and condensed matter, nuclear physics, particle physics and cosmology.

Textbook: University Physics by H.D. Young and R.A. Freedman, 13th Edition, Addison-Wesley (2012). Available at the bookstore.

Grading: 1st Midterm 22 %, (to be announced)
2nd Midterm 22 %, (to be announced)
Laboratory Work 18 % (2% per experiment + 6% Lab final)
6 Quizzes 6% (1% per quiz)
Final 27% (to be announced)

Attendance Policy: If a student attends 90%-100% of the classes s/he obtains 5%, if a student attends 70%-90% of the classes s/he obtains 3%, if a student attends 50%-70% of the classes s/he obtains 1%.

Lecture Schedule:

Week	Subject	Week	Subject		
1	Feb. 3	Electromagnetic Waves (Ch.32) / The Nature and Propagation of Light (Ch. 33)	9	Mar. 31	Quantum Mechanics (Ch. 40)
2	Feb. 10	The Nature and Propagation of Light (Ch. 33)	10	Apr. 7	Spring Break
3	Feb. 17	Geometric Optics (Ch. 34)	11	Apr. 14	Quantum Mechanics (Ch. 40)
4	Feb. 24	Interference (Ch. 35)	12	Apr. 21	Atomic Structure (Ch. 41) / MT 2 (Ch.s 37-40)
5	Mar. 3	Diffraction (Ch. 36)	13	Apr. 28	Molecules and Condensed Matter (Ch. 42)
6	Mar. 10	Relativity (Ch. 37) / MT 1 (Ch.s 32-36)	14	May 5	Nuclear Physics (Ch. 43)
7	Mar. 17	Photons: Light Waves Behaving as Particles (Ch. 38)	15	May 12	Particle Physics and Cosmology (Ch. 44)
8	Mar. 24	Particles Behaving as Waves (Ch. 39)			Comprehensive Final Exam

Laboratory Rules

General Physics IV course is accompanied by laboratory work and problem sessions. During the first week of classes all students will have laboratory and problem session orientation in SCI Z34 in their scheduled PS hours.

Attendance

Students are required to attend all scheduled laboratory experiments. Make-up laboratories are very reluctantly given only with a university approved medical excuse, and if given, will always be harder than the original laboratories. Students should not plan to take make-ups.

Before the laboratory experiment

Students should read the experiment manual before coming to the laboratory to do the experiment. Students are expected to collect enough knowledge about the experiment by reading the introduction and theory sections to have the necessary theoretical background of the experiment. The students should read the procedure section in order to familiarize themselves with the experiment, before coming to the laboratory.

During the laboratory experiment

Anyone who fails to come to the laboratory within the first 15 minutes will be assumed absent. The time determined for each experiment is 165 minutes. Students have to complete all laboratory work within this determined time. If this time does not suffice for the work, the students will not be given extra time.

Students are expected to check the instruments and components needed for the experiment and report anything missing or unusual. After the experiment starts, they will be responsible for the experimental set-ups. During the experiments, the students must take all the necessary data and perform all the calculations necessary to analyze the experiment and write their laboratory reports. Use of pencil is not allowed in the laboratory; everything should be written in pen.

After completing the experiment, students should clean up the setups and turn off all the electronics and the computer. Students should leave the instruments and components in order and in good condition. The students are not allowed to leave, before the lab instructor's approval. Taking any equipment out of the laboratory is an offense and may result in disciplinary action. Moreover, the students will be financially responsible to replace all the missing equipment.

The students should get their data checked and confirmed by the assistant before leaving the laboratory. All of these above mentioned issues affect the Laboratory Performance Grade of the student.

Laboratory Reports

Each Student should write a report of the experiment during the lab hour.

You have to write your report in your laboratory notebook. You are not allowed to use pencil in any characters, figures, drawings, etc.

Students have to leave their laboratory notebooks in the laboratory.

All pages must have page numbers.

All figures and tables must have their figure and table numbers.

Laboratory Report Format

The laboratory report should include the following sections in scientific format:

Introduction section including the objective of the experiment. **(5 points)**

Theory section including the theoretical background and the equations related to the experiment. **(5 points)**

Experimental setup section including a brief procedure of the experiment. **(5 points)**

Data analysis section including the data in tabular form and the plots with suitable titles, units, and scales on both coordinate axes. **(35 points)**

Discussion section including detailed answers to the questions. **(40 points)**

Conclusion section including conclusions drawn from the experiment. **(5 points)**

Hand writing should be easily readable. **(5 points)**

Tentative Laboratory Schedule

	1	2	3	4
Week 1-February 3	Lab Orientation	Lab Orientation	Lab Orientation	Lab Orientation
Week 2-February 10	Michleson Interferometer	Geometric Optics	PS	
Week 3-February 17	PS		Michleson Interferometer	Geometric Optics
Week 4-February 24	Geometric Optics	Michleson Interferometer	PS	
Week 5-March 3	PS		Geometric Optics	Michleson Interferometer
Week 6-March 10	Blackbody Radiation	Photoelectric Effect	PS	
Week 7-March 17	PS		Blackbody Radiation	Photoelectric Effect
Week 8-March 24	Photoelectric Effect	Blackbody Radiation	PS	
Week 9-March 31	PS		Photoelectric Effect	Blackbody Radiation
Week 10-April 14	e/m	Discharge tube spectroscopy	PS	
Week 11-April 21	PS		e/m	Discharge tube spectroscopy
Week 12-April 28	Discharge tube spectroscopy	e/m	PS	
Week 13-May 5	PS		Discharge tube spectroscopy	e/m