PY212 - Principles of Physics II
Summer 2, 2022

Course Information

Instructor:

Professor Kevin Smith;
Lecture: Monday, Tuesday, Wednesday and Thursday 11:30 - 1:30 pm, SCI 109
Office: SCI 357. Phone: 3-6117. e-mail: ksmith@bu.edu
Office Hours: Tuesdays and Wednesdays 9:30 - 10:30 AM; or by appointment.

Texts:
1. Halliday & Resnick, Fundamentals of Physics, Vol II, 12th Edition
2. *Physics Laboratory Experiments for PY 212*; https://physics.bu.edu/ulab/all_labs.html

Calculator:
Access to a scientific calculator with trigonometric and exponential functions, is required.

Syllabus:
Selections from Halliday & Resnick; a detailed syllabus is attached.

Grades:

Midterm Exam #1	20%
Midterm Exam #2	20%
Final Exam	30%
Laboratory	10%
Discussion Section (homework)	10%
Lecture (attendance & class participation)	10%

Exam Dates:

Midterm Exam #1:	***Monday, July 18*** *in class – 11:30 AM to 12:50 PM*
Midterm Exam #2:	***Monday, August 1,*** *in class – 11:30 AM to 12:50 PM*
Final Exam:	***Thursday, August 11,*** *in class – 11:30 AM to 1:30 PM*

REASONS FOR AUTOMATIC FAILURE:
1: Miss, or fail to turn in on time, **ANY** of the labs.
2: Hand in less than half the homeworks on time, or attend less than half the discussion sections.
3: Miss any of the midterm exams, or the final exam.

Course Prerequisites: PY211, and MA124 or MA127 or equivalent. You MUST see the professor if you have not taken these courses. Note that it is assumed you **know** the content of these courses!

Notes on labs, homework, exams and grades.

General:

1: You must register for a lab section. Discussion sections are combined with the lab sections.
2: There are no labs, discussion sections, or office hours during the first two days of class.
3: Office hours for Professor Smith are listed above. Office hours for TFs will be given in class. All instructors are available during office hours or by appointment.
4. **ALL electronic devices are banned during lectures. This includes computers, cell phones and audio/visual recording or playback devices of any kind**.
5. Electronic mail will be used to confirm course announcements made in class, so please check your mail regularly. Physics questions will NOT be answered by e-mail. E-mail should be used to set up an appointment to see Professor Smith.

Discussion Sections and Homework:

6: Homework is due in the TF boxes (1st floor of SCI) by **5:00 pm** on the day stated for the assignment. **Homework handed in ANYWHERE else will not be accepted, and a zero grade will be given. Late homeworks will not be accepted, and will also be given a zero grade.**
7: **You may only attend the section in which you are registered.**

Lecture Attendance:

8: Attendance will be taken. Late arrival or early departure will count as a missed lecture.

Labs:

9. The complete schedule of 6 experiments is included in the class schedule below. Labs will be held in the basement of SCI. The room assignments for each lab will be prominently posted on all lab doors. Each lab is available in the assigned day only. **THERE ARE NO MAKEUP LABS**. Lab reports must be turned in at the next lab, or as required.
10. You can only attend the lab for which you are registered. Attendance will be taken.
11. You must come to the lab prepared: go to https://physics.bu.edu/ulab/all_labs.html, and prepare as much of the Laboratory Report as possible.

******* IMPORTANT *******

THERE ARE NO MAKEUPS FOR ANYTHING*! No exams, no quizzes, no labs, no homeworks. There are **NO** alternate exam times. It is your responsibility to attend class and have your work done on time. Do not make travel plans that will cause you to miss **any** exams. Failure to attend the scheduled exams will result in an **F** grade for the course.*

Possession of notes or other banned materials or devices during an exam will be considered *prima facie* evidence of plagiarism. Students violating the rules of an exam will be reported to the Academic Conduct Committee of the College of Arts and Sciences, and will receive a zero grade for the exam. Please read the CAS Academic Conduct Code, which applies to this course.

PY212: Physics II – Summer 2022 - Class Syllabus and Schedule				
Week	**Date**	**Topic**	**Chapter**	**Laboratory**
1	Tuesday, 7/5	Electric Charge	21	No Labs or Discussion Section
	Wednesday, 7/6	Electric Fields	22	
	Thursday, 7/7	Electric Fields and Gauss' Law	22 & 23	Discussion Section only.
	Friday, 7/8	Gauss' Law and Electric Potential	23 & 24	
2	Monday, 7/11	Electric Potential	24	**Coulomb's Law** + Discussion Section
	Tuesday, 7/12	Capacitance & Dielectrics	25	
	Wednesday, 7/13	Capacitance & Dielectrics	25	Discussion Section only
	Thursday, 7/14	Currents in Materials	26	
3	Monday, 7/18	**Midterm #1**		**Fields and Potentials** + Discussion Section
	Tuesday, 7/19	Direct Current Circuits	27	
	Wednesday, 7/20	Direct Current Circuits	27	Discussion Section only.
	Thursday, 7/21	Magnetic Fields	28	
4	Monday, 7/25	Magnetic Fields	28	**Ohm's Law** + Discussion Section
	Tuesday, 7/26	The Magnetic Field of a Current	29	
	Wednesday, 7/27	Inductance and Faraday's Law	30	Discussion Section only.
	Thursday, 7/28	Inductance and Faraday's Law	30	
5	Monday, 8/1	**Midterm #2**		**e/m Ratio** + Discussion Section
	Tuesday, 8/2	Alternating Current Circuits	31	
	Wednesday, 8/3	Magnetism and Matter	32	**Faraday's Law** + Discussion Section
	Thursday, 8/4	Electromagnetic and Light Waves	33	
6	Monday, 8/8	Electromagnetic and Light Waves	33	**RLC Circuits** + Discussion Section
	Tuesday, 8/9	Mirrors and Lenses	34	
	Wednesday, 8/10	Interference & Diffraction	35	No Labs or Discussion Section
	Thursday, 8/11	**Final Exam**		

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Homework Assignments

#	Homework Topic	Chapter	Due Date	Content
1	Electric Charge and Electric Fields	21 & 22	Friday 7/8	
2	Gauss' Law and Electric Potential	23 & 24	Wednesday 7/13	
3	Capacitance and Dielectrics	25	Monday 7/18	
4	Currents in Materials	26	Thursday 7/21	
5	DC circuits	27	Monday 7/25	
6	Magnetic Fields	28	Wednesday 7/27	
7	The Magnetic Field of a Current	29	Monday 8/1	
8	Faraday's Law	30	Wednesday 8/3	
9	AC Circuits	31	Friday 8/5	
10	Magnetism in Matter,	32	Monday 8/8	
11	Light Waves, Mirrors and Lenses,	33, 34, 35	Wednesday 8/10	

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Procedures for Laboratory Operations and Write-ups

1. Each lab write-up is due at the start of the following lab. The schedule of labs is included in the syllabus.
2. No late labs will be accepted. A zero grade will be assigned.
3. Make sure that your data, be it recorded in your notebook or on the data sheet provided with the experiment, is initialed by the TF before you leave the Lab. Otherwise, no credit for the lab will be given and you will receive a zero for that experiment.

General Lab Guidelines and Technique

1. The goal of the labs is to learn the experimental techniques and to learn to compare data from an experiment to the predictions of physical laws. The goal is not to get a certain specific set of numbers listed properly. It is more important to try a different set of parameters or attempt a related experiment than it is to have all the data fit the theory.
2. Read the lab instruction prior to coming to lab. If you fail to read the lab ahead of time, you won't know what's happening and it will take much longer to complete.
3. The lab TF will begin each lab recapping the important procedures, highlighting the purpose of each experiment and describing any relevant safety precautions. Pay attention during these first ten minutes, it will save you much time later on. Also, TF's will instruct you in any changes to the procedures and curtailment of the number of questions to be answered.
4. Write in the lab book as you perform the lab. Begin by listing the date, lab, partner(s), etc. Include diagrams, notes, data, descriptions, possible ideas you have along the way. This part need not be excessively neat and organized. On the other hand, messiness is not encouraged. Record impressions, mistakes made, and possible sources of errors. e.g. "The ball was thrown down instead of dropped, and might thereby affect the initial velocity and subsequent speed". Make tables of all numbers, either in the lab book itself or on the data sheet provided. In the latter case, the data sheet must be stapled into the lab book. Lab TF's are instructed to shake each lab book upon receipt, and throw away any loose paper.
5. The lab notebook, complete with the notes and data taken during the lab and the lab write-up, must be handed in to the TF at the beginning of the following class. The write-up section begins with a brief statement of purpose, and a brief description of the experiments. Following this the data analysis is included and questions about the lab are answered. Some labs have separate analysis and conclusions, while some incorporate the analysis in the questions. Then, a brief discussion of the errors, their sources and any problems with the experiment is made.