PEP 112 Electricity and Magnetism (E&M)

Department of Physics and Engineering Physics
Stevens Institute of Technology
Semester: Spring 2023

Schedule:

PEP 112A: Mon. & Fri., 8:00-8:50 am, EAS222
PEP 112B: Mon. & Fri., 10:00-10:50 am B111
PEP 112C Mon. & Fri. 9:00-9:50 am B111
PEP 112D Mon. & Fri., 12:00-12:50 am GS216
PEP 112E Mon. & Fri., 1:00-1:50 am Howe 303

Instructor and Course administrator:

PEP 112 A,B,E
Prof. Robert Pastore
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Office: Burchard 707
Office Hours:

PEP 112 D

Professor Xiaofeng Qian
Email: @stevens.edu
Office:

PEP 112 C
Prof. Tatiana Morozova
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Office: burchard 720
Office Hours:

I reserve the right to change the syllabus at anytime and for any reason.

Course Description

This course will explore the origins and uses of electricity and magnetism starting with charges and how the create electric and magnetic fields. Force between charges will be calculated using coulombs law, electric fields due to discrete charges and continuous charge distribution will be calculated and the force on charges by electric fields will be explained. Electric flux and Gauss's law will be used to calculate electric fields. Work and conservation of energy and kinematics will be applied to moving charges. Current and basic DC circuits with capacitors and resistors will be explained. Magnetic forces on moving charges, magnetic fields created by moving charges and currents using the Biot-Savart law and amperes law. Faradays law, magnetic flux and Lenz's law explained to lead up to inductors, inductance and the idea of included emf and induced currents

Required Materials

1. Textbook:

Option 1: Halliday, Fundamentals of Physics, 11e Volume II print text with WileyPLUS: 9781119478805 ($)

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OR

Option 2: Halliday, Fundamentals of Physics, 11e WileyPLUS access: There are slides in canvas on how to register for wileyplus.

You can purchase an electronic copy of the textbook online at wileyplus.com when you register/purchase access to webassign.net. (**Note: laptops, e-book readers, smart phones and tablet computers are not allowed during the exams.**

2. WileyPlus: You will log in to wiley plus through you recitation page and sign up there.

Course Objectives: (1) To understand fundamental principles of electric charges, electric fields and forces, magnetic fields and forces, electric circuits, electromagnetic induction, and electromagnetic waves. (2) To perform calculations using algebra, trigonometry, and calculus of the electric and magnetic fields produced by charges; the forces exerted on charges by electric and/or magnetic fields; properties of electric circuits involving capacitors, resistors, inductors, generators, transformers, and batteries; properties of electromagnetic waves.

Cell Phone Policy During Exams/Quizzes

NO CELL PHONES ARE ALLOWED TO BE OUT DURING THE EXAMINATION. To this end cell phones will be placed on the desk by the proctor during the exam or they can be placed in your backpack which will be placed in the front of the exam room during the exam. If a student is found with their cell phone during the exam, they will be reported to the honor board.

Grading Procedure

Grades are calculated from a weighted average of homework and exams. The various components of your grade have the following weights:

Final Exam…….……25%
Thursday exams… …..……..…….35%
Homework …….15%
In Recitation quizzes… ……....15%
Recitations…….…….10%

Final letter grades will be calculated based on the following distribution:

Letter Grade:	% Grade:
A	90-100%
B+/B/B-	80-89.9%
C+/C/C-	70-79.9%
D+/D/D-	60-69.9%
F	<60%

Homework: Homework will be administered online using WileyPlus. There will be 12 assignments corresponding to each chapter in the textbook covered (21-33). All of the homework will be due by last day of the semester, which is the last day of classes for the semester. Making the homework due this way will obviate the need to grant extensions for not being able to do the homework. **THERE WILL BE NO EXTENSIONS PAST THE LAST DAY OF CLASSES OF THE SEMESTER.** My recommendation is to do the homework as we go over each chapter during the semester so as to get ready for the exam on the material.

Exams: There will be four regular exams during the semester during the Thursday evening test session. You will be allowed one 8.5 by 11 sheet with equations to use during the exam. **We will be dropping the lowest exam grade. If you miss an exam for any reason this will be the exam score that is dropped. If you miss more than one exam you will need an excused absence from the Dean's office to make up these additional exams. The make up exam for those with valid excuses from the deans office, is the following Monday morning at 7 am.**

Final Exam: The final exam is mandatory and comprehensive covering the entire course. This exam will be cumulative, but will favor the last chapters covered at the end of the semester.

In-Recitation Quizzes: During the semester, there will be quizzes during recitation lasting 15 to 20 minutes. They will consist of 4 multiple choice questions testing qualitative understanding of material from recent classes. These quizzes are also to help me see where the problem areas are of things I might not have covered well enough. **You may use the textbook, lecture notes, and calculator for these quizzes. There will be no makeups for the missed quizzes.**

Recitations: The recitations on Tuesday are devoted to solving problems relevant to the exams and HW. These problems will be worth 10% of your final grade. They will consist of conceptual problems and some numerical problems. You will work in groups of two on the problems. You are encouraged to talk about how to do the problem with your partner. After about 15 minutes of working on a problem you will present the work to the class, either by writing on the whiteboard or telling the TA what to write. **There will be no makeups for missed worksheets.**

Lecture notes and practice quizzes: Lecture notes will be posted on the canvas page within 24 hours ***after*** each chapter has been completed in lecture. Also, practice quizzes and final exams with solutions will be posted on canvas. (These are quizzes that were used in previous semesters.) These documents will be located under the folder "Course Materials".

Tips for succeeding in this class:

1. Ask questions and engage in recitations, they are the best time to explore concepts and to solidify your understanding of the topics.
2. If you are having difficulties with the HW or quizzes, seek out help! Talk to the instructor for advice, go to the Physics Help Center to ask questions, or find a tutor from the Academic Support Center. Students who seek out help with physics typically do much better in the class than those who do not.
3. Read each chapter in the textbook as we cover the material in class. This will reinforce the concepts presented in class.
4. Read each chapter of the textbook ***again*** after we finish each chapter and before the exam.
5. Do the practice quizzes before each quiz. Try to complete the quizzes in 50 minutes.

Tentative Exam Schedule

Feb 9
Mar 2
Mar 30
Apr 27

Note: Quiz topics and dates are tentative and subject to change. Any changes will be announced in class. Check registrar's website for quiz room locations based on recitation section:
http://www.stevens.edu/sit/registrar/

Tentative Lecture Schedule:

Lecture Number	Textbook Chapter
1	21
2	21
3	22
4	22
5	22
6	23
7	23

8	23
9	24
10	24
11	24
12	25
13	25
14	26
15	26
16	27
17	27
18	27
19	28
20	28
21	28
22	29
23	29
24	29
25	30
26	30
27	30
28	31

Note: Lecture schedule is tentative and subject to change.