

DEPARTMENT OF PHYSICS & ASTRONOMY
PHYS 40C (020) General Physics – Electricity and Magnetism
Class Website: elearn.ucr.edu

Overview: This course covers the fundamentals of electricity and magnetism. Topics include electric fields and potential; Gauss' law; capacitance; magnetic fields; Ampere's law; Faraday's law and induction; electromagnetic oscillations; DC/AC current; and circuits. The course is designed for engineering and physical sciences majors.

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Office Hour: Thursdays, 11:00 AM - 12:00 PM

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Lectures: Tuesdays & Thursdays, 9:30 AM - 10:50 AM
Location: Physics 2000

Textbook: *Physics for Scientists and Engineers*, 4th Edition, Pearson
(ISBN 978-0-133-94265-1)

Prerequisites: PHYS 40B or 40HB *and* MATH 9C or 9HC.
Trigonometry, vectors, and calculus are used in lectures, homework, and exams.

Exams: **Midterm 1** – Thursday, Oct. 14, in class
Midterm 2 – Thursday, Nov. 4, in class
Final Exam – Tuesday, Dec. 7, 11:30 AM – 2:30 PM, Physics 2000

The exams are designed to test your *conceptual understanding* of the physics, not memorization. A formula sheet will be provided. Each exam will cover topics up to those on the most recently submitted problem set. If you understand how to solve every homework problem, you will do well on the exams.

The exams will *focus* on the most recently covered topics, but all material up to that point in the class is fair game (e.g., there might be a two-part problem, where the first part relies on knowledge from earlier in the class). **There are no make-up exams**, except in cases of documented medical emergencies.

Homework: Weekly homework problem sets will be assigned through the Pearson Mastering Physics site, accessible from the “Assignments” link on the left side of the class website. Problem sets will be posted after lecture on Tuesday afternoons and are due on the following Monday by 11:59 PM PT. **No credit will be given for late submissions.**

In order to complete the problem sets, you must create a Mastering Physics account (if you do not already have one) and **link it to this course**. Instructions for linking your account to this course are posted on the class homepage.

Academic

Integrity: Forming small study groups to solve the problem sets **is allowed and encouraged**, as working together with your peers can be one of the most effective ways to learn physics. However, after figuring out a solution strategy, you *must* work out the problem, from start to finish, *on your own*. It will do you no good on the exams (which by far count the most toward your grade) if you copy someone else’s solutions without understanding them for yourself.

Violations of UCR’s [Academic Integrity Policy](#) are taken very seriously and will be reported to the University. Incidents have the potential to result in severe penalties, up to a failing grade for the course and suspension from the University.

Pre-Lecture

Reading: Each lecture, you will be responsible for reading the textbook chapter listed in the syllabus for that date *before* coming to class. Seeing the material for the second time in class, instead of for the first time, will make it much easier for you to follow the lectures and get the most out of this course. Each lecture will start with several questions testing your familiarity with the assigned reading material. The questions will be big-picture in nature and mostly qualitative (i.e., they will not require a deep understanding of the physics yet).

We will use Poll Everywhere to electronically collect your answers to the pre-lecture questions, which you will submit in real time from your phone or laptop. To get credit for your answers, **you must pre-register** on the Poll Everywhere app or at [PollEv.com](https://www.poll-everywhere.com) using your UCR NetID and the presentation username [PollEv.com/PHYS40C](https://www.poll-everywhere.com). To offset any technology issues, **your five lowest question scores will be dropped** at the end of the term.

Discussion: Every week you will attend a discussion section to elaborate on the lecture material. During this time you will work in groups on problems meant to enhance

the scope of the subject matter presented in lecture. Discussion section will be graded more on participation and effort than accuracy of your results.

Discussion sections will begin meeting during Week 1 of the quarter (see the class schedule below).

Laboratory: Lab sections will normally meet once per week. Your final lab meeting will consist of a Lab Skills Assessment. Refer to the Student Information Guide on eLearn to learn how your Laboratory Score will be determined.

Grading

Policy: The letter grade cut-offs will be determined at the end of the term, based on the distribution of scores. Scores will be calculated based on the following weighting:

Midterm Exam 1	15%	
Midterm Exam 2	15%	
Final Exam	25%	
Homework (Mastering Physics)	20%	
Pre-Lecture Questions (Poll Everywhere)	5%	(Dropping five questions)
Discussion Section	10%	
Laboratory Score	10%	

Tutoring: Tutoring and supplemental instruction are available from the Academic Resource Center (ARC), which is staffed by professional and trained student employees. For more information, or to schedule an appointment, visit arc.ucr.edu or call 951-827-3721.

TENTATIVE CLASS SCHEDULE

<u>Week</u>	<u>Day</u>	<u>Date</u>	<u>Topics</u>	<u>Ch.</u>
0	Thu.	Sep. 23	Introduction; Electric Charges and Fields	22
1	Tue.	Sep. 28	Electric Field Due to Multiple Charges	23
	Thu.	Sep. 30	Electric Field Due to a Wire	23
2	Tue.	Oct. 5	Gauss' Law	24
	Thu.	Oct. 7	Electric Potential Energy	25
3	Tue.	Oct. 12	Electric Potential	25
	Thu.	Oct. 14	Midterm Exam 1	
4	Tue.	Oct. 19	Capacitance	26

	Thu.	Oct. 21	Current & Resistance	27
5	Tue.	Oct. 26	Power & Ohm's Law	27
	Thu.	Oct. 28	Equivalent Circuits	28
6	Tue.	Nov. 2	Kirchhoff's Laws	28
	Thu.	Nov. 4	Midterm Exam 2	
7	Tue.	Nov. 9	Magnetic Fields	29
	Thu.	Nov. 11	No Class (Veterans Day)	
8	Tue.	Nov. 16	Magnetic Forces	29
	Thu.	Nov. 18	Faraday's Law	30
9	Tue.	Nov. 23	Electromagnetic Fields & Waves	31
	Thu.	Nov. 25	No Class (Thanksgiving)	
10	Tue.	Nov. 30	Maxwell's Equations	31
	Thu.	Dec. 2	Review Session	
11	Tue.	Dec. 7	Final Exam	