PHYS 143 — Electricity and Magnetism

Cal Poly Physics Department
Spring 2025

Course Information

Instructor:	Dr. Reza Monadi
Office:	26-M, Room 109
Email:	rmonadi@calpoly.edu
Office Hours:	Wednesdays 1–3 PM, Thursdays 3–5 PM
Classroom:	26-104
Class Time:	MWF 12:10 PM – 1:00 PM

Course Description

This is an introductory, calculus-based course on electricity and magnetism. Topics include electric charge, electric fields, electric potential, dielectrics, capacitors, current, resistance, circuits, magnetic fields, and electromagnetic induction.

Prerequisites: MATH 142 and PHYS 141
Recommended: MATH 241
GE Credit: Areas B1 and B3

Learning Outcomes

By the end of this course, you will be able to:

- Describe core concepts such as electric fields, potentials, currents, circuits, and magnetic fields
- Apply critical thinking and scientific communication skills
- Visualize and analyze electricity and magnetism problems
- Analyze electric fields for various charge distributions
- Analyze voltage and current in basic electric circuits
- Analyze magnetic fields produced by current configurations

Required and Recommended Materials

- **Required Textbook:** Randall D. Knight, *Physics for Scientists and Engineers: A Strategic Approach*, 4th Edition (Pearson)
  ISBN: 0133942651
- **Optional:** OpenStax *University Physics*, Volume 2 (free online)

Course Schedule

Week	Topics
1	Ch. 22: Electric Charges and Forces
2	Ch. 23: Electric Field
3	Ch. 24: Gauss's Law
4	Review; Midterm 1; Ch. 25: Electric Potential
5	Ch. 26: Potential and Electric Field
6	Ch. 27: Current and Resistance
7	Ch. 28: Fundamentals of Circuits
8	Review; Midterm 2; Ch. 29: Magnetic Field
9	Ch. 29: Magnetic Field
10	Ch. 30: Electromagnetic Induction
Final	Final Exam

Exams

- **Midterm 1:** Wednesday, April 23, 2025, 12:10 PM
- **Midterm 2:** Wednesday, May 21, 2025, 12:10 PM
- **Final Exam:** Monday, June 9, 2025, 10:10 AM – 1:00 PM

All exams take place in the regular classroom.

Grading Policy

Category	Weight
Homework	10%
Lab Reports	15%
Weekly Quizzes	10%
Midterm Exams (2)	30%
Final Exam	35%
Total	100%

There is no extra credit. Final letter grades are determined using the class grade distribution (z-score based). Performing above the class average is the most reliable way to earn an A or B.

Course Policies

- Attendance and participation are strongly encouraged
- Homework deadlines must be met

- Collaboration on homework is allowed, but submitted work must be your own
- Minimize use of phones and laptops during class
- Academic integrity is required; violations will be reported per university policy

Student Support Resources

- **Disability Resource Center:** Building 124, Room 119; (805) 756-1395
- **Learning Support Center:** Free tutoring for all Cal Poly students
- **Counseling and Psychological Services**
- **Campus Food Pantry**