

Instructor: Howard Haber
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Office Hours: Mondays 3–4 pm and Thursdays 2–3 pm

COURSE WEB PAGE:

<http://scipp.ucsc.edu/~haber/ph214/>

CLASS HOURS:

Lectures: Tuesdays and Thursdays, 11:40 am–1:15 pm

REQUIRED TEXTBOOK:

Classical Electrodynamics, 3rd edition, by John David Jackson

RECOMMENDED OUTSIDE READINGS:

Classical Electromagnetism in a Nutshell, by Anupam Garg

Modern Electrodynamics, by Andrew Zangwill

Macroscopic Electrodynamics: An Introductory Graduate Treatment, by Walter Wilcox
and Chris Thron

OTHER SUGGESTED OUTSIDE READINGS:

Electrodynamics and Classical Theory of Fields and Particles, by A.O. Barut

Modern Problems in Classical Electrodynamics, by Charles A. Brau

Classical Electrodynamics, by Walter Greiner

Classical Theory of Electric and Magnetic Fields, by R.H. Good, Jr. and T.J. Nelson

Classical Electromagnetic Radiation (3rd edition), by Mark A. Heald and Jerry B. Marion

Electromagnetic Fields and Relativistic Particles, by Emil J. Konopinski

The Classical Theory of Fields, by L.D. Landau and E.M. Lifshitz

Classical Electrodynamics—A Modern Perspective, by Kurt Lechner

Electrodynamics—An Intensive Course, by Masud Chaichian et al.

Electrodynamics (2nd edition), by Harald J.W. Müller-Kirsten

Classical Electricity and Magnetism, by W.K.H. Panofsky and M. Phillips

Classical Electrodynamics, by Julian Schwinger et al.

Advanced Classical Electromagnetism, by Robert M. Wald

COURSE OUTLINE

1. Review of Maxwell's Equations and Electromagnetic Wave Propagation
2. Wave Propagation in a Dispersive Medium
3. Special Theory of Relativity
4. Simple Radiating Systems and Antennae
5. Multipole Fields
6. Dynamics of Relativistic Particles and Electromagnetic Fields
7. Radiation by Moving Charges
8. Scattering of Electromagnetic Waves

Course Grading and Requirements

50% Homework (5 problem sets)

20% Midterm Exam (take-home exam)

30% Final Exam (Wednesday March 20, 2023, 4–7 pm in ISB 231)

The coursework will consist of five homework problem sets, a take-home midterm exam and an in-class final exam. Homework assignments are *not* optional. Homework assignments are due on Tuesdays (with two weeks allotted for each homework set). You are encouraged to discuss the class material and homework problems with your classmates and to work in groups, but all submitted problems should represent your own work and understanding.

The midterm exam will be a one day take-home exam, which will be handed out in class on Tuesday February 20 and must be returned in class on Thursday February 22. The final exam will be an open book/open notes in-class exam that will be held in ISB 231 on Wednesday March 20 from 4–7 pm. During the final exam, you will be permitted to consult any textbook of your choosing, your class notes, and any class handout (including solutions to the problem sets). The final exam will cover the entire course material. You must take the final exam to pass the course.