Instructor: Howard Haber
Office: ISB, Room 326
Phone Number: 459-4228
E-mail: haber@scipp.ucsc.edu
Office Hours: Mondays and Tuesdays from 3–4 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 (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, Lester L. DeRaad, Jr., Kimball A. Milton and Wu-yang Tsai

Advanced Classical Electromagnetism, by Robert M. Wald

COURSE OUTLINE

1. Review of Maxwell's Equations and Electromagnetic Wave Propagation
2. Waveguides and Resonant Cavities
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 (one day take-home exam)
30% Final Exam (Monday March 20, 2023, 8–11 am in ISB 231)

Homework assignments are *not* optional. Homework assignments are generally due on Thursdays (with two weeks allotted for each homework set) unless otherwise noted. 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 posted to the class website on Thursday February 16 and will be due at the end of the following day. The final exam will be an open book/open notes in-class exam that will be held in ISB 231. 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.