

# Physics 121 – Intermediate Electricity and Magnetism

## General Information

course meeting: MWF, 11:00am, TCSeq102

Professor: Michael E. Peskin  
SLAC, Central Lab R322 926-3250  
Varian 360 (Mondays) 736-0326  
mpeskin@slac.stanford.edu

TA: Jonathan P. Hsu  
Varian 349 724-6745  
office hours: Th 4-5 pm  
pihsu@stanford.edu  
discussion section: Tu, 7 pm, TCSeq101

Textbook: Griffiths, Introduction to Electrodynamics

Useful references: Heald and Marion, Classical Electromagnetic Radiation  
Feynman, Leighton, and Sands, The Feynman Lectures on Physics, vol. 2  
Jackson, Classical Electrodynamics  
Taylor and Wheeler, Spacetime Physics

Web page: <http://www.slac.stanford.edu/~mpeskin/Physics121/>

Midterm: May 3 – in class

Final: June 12 – 8:30am

## Syllabus

1. Magnetic induction
2. The Fourier transform
3. Maxwell's equations
4. Energy and momentum of the electromagnetic field
5. The wave equation
6. Waves in ideal media: transmission, reflection, and refraction
7. Waves in non-ideal media: dispersion and absorption
8. Waveguides
9. Theory of relativity

# Physics 120, 121, 124 – Intermediate Electricity and Magnetism Syllabus Overview

- Physics 120: Static Fields
  1. Electrostatics
  2. Laplace's equation
  3. Electric fields in matter
  4. Magnetostatics and magnetic materials
  5. Energy in electric and magnetic fields
- Physics 121: Dynamic fields
  1. Magnetic induction
  2. The Fourier transform
  3. Maxwell's equations
  4. Energy and momentum of the electromagnetic field
  5. The wave equation
  6. Waves in ideal media: transmission, reflection, and refraction
  7. Waves in non-ideal media: dispersion and absorption
  8. Waveguides
  9. Theory of relativity
- Physics 124: Radiation
  1. Relativity and electrodynamics
  2. Radiation from moving charges
  3. Antennas and arrays of radiators
  4. Multipoles and radiation patterns
  5. Scattering of electromagnetic radiation
  6. Diffraction
  7. Relativistic electrodynamics