Course: Electromagnetic Theory
Textbook: Introduction to Electrodynamics (D.J. Griffith, 3rd edition)
Grading: Homework (40%), three exams (each 20%)

Subjects to be covered (tentatively)
Chapter 1 Maths that are needed for this course
- Vector operation, components, triple products
- Gradient, divergence, curl, second derivative
- Line, surface, and volume integrals
- Spherical and cylinder coordinates
- Delta functions

Chapter 2 Electrostatics
- Coulomb’s law, electric fields
- Gauss’s law, divergence and curl of electric fields
- Electric potential, Poisson’s equation, boundary conditions
- Conductors, forces on conductors, and capacitors

Chapter 3 Special techniques
- Laplace’s equation
- Method of images

Chapter 4 Electric fields in matters
- Dipoles and polarization
- Electric fields generated by bound charges
- Electric displacements, Gauss’ law for dielectrics
- Linear dielectrics, capacitors with dielectrics

Chapter 5 Magnetostatics
- Forces on moving charges and on current
- Biot-Savart law
- Ampere’s law, curl and divergence of B
- Boundary condition for B, Magnetic vector potential

Chapter 6 Magnetic fields in matters
- Magnetic moments of atom, magnetization
- Magnetic fields generated by bound currents
- Auxiliary field, its relationship with magnetization

Chapter 7 Electrodynamics
- Generation of voltage power, Faraday’s law
- Induced electric fields, inductance
- Maxwell’s equations

Office: Physics 207; Office Hours: M (3:30-5:00PM), W (1:30-3:00PM)