Phys 326*
Electricity and Magnetism*

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Lectures: 8:30 – 9:30 TWF, Elliott 162

Labs: All lab sections are held in the Elliott building.
               Labs start during the week of September 14.
               You must complete and pass the labs to obtain credit for the course.

Office Hours: Keeler:
               T 1:30 – 3:00 and W 1:30-3:00
               For other times, email me to determine a mutually agreed time.
Course Website: Course Spaces
Text: "Introduction to Electrodynamics, Fourth edition", David J. Griffiths

Topics:

1. Vector Calculus
2. Gradient, Divergence, Curl, Laplacian in curvilinear coordinates.
3. Gauss' (Divergence) Theorem.
4. Stokes' (Curl) Theorem.
5. Electrostatics
6. Coulomb's Law.
7. Electric field and potential.
8. Gauss' theorem in integral and differential form.
9. Electrostatic energy.
10. Poisson's and Laplaces equations.
11. Multipole expansion. Monopole, dipole and quadrupole contributions.
12. Torque and energy of dipole.
13. Boundary conditions on conductors.
14. Uniqueness theorem.
15. Method of images.
16. (Solutions of Laplaces equation.)
17. Dielectrics, permittivity, polarisability and dielectric constant.
18. Polar molecules.
19. Boundary conditions on dielectrics.
20. Magnetism
21. Force between moving charges
22. Biot-Savart Law
23. Vector Potential
24. Force and Torque

25. Ampere's Law
26. Dipole Field
27. Magnetic Material
28. Volume and Surface Current
29. Linear Materials
30. Faraday's Law
31. Magnetic Energy
32. Maxwell's Equations
33. Wave Propagation (if time permits)
34. Energy Transport (if time permits)