PHYS 304, Advanced Electricity and Magnetism I  
Fall 2009 Syllabus  
Texas A&M University

Lectures: MWF, 10:20-11:10, room 206 Engineering Physics Building
Instructor: J. H. Ross, Email: ross@physics.tamu.edu

course web-page: faculty.physics.tamu.edu/ross/304page.html
office: 422 ENPH (845-3842); lab: B03 ENPH (845-7823)
office hours: MW 1:00-2:00, or most anytime; email first if possible (and try my lab if I am not in the office)


Prerequisites: PHYS 208 and PHYS 331 or equivalents

Grading:  
- Homework (approx. 10 sets) 15%
- Exam 1 25%
- Exam 2 25%
- Final Exam 35%

Tentative schedule with corresponding chapters in Griffiths text. Exams: these may be moved to an evening close to the indicated date if schedules allow.

week 1  8-31 to 9-4  Overview & Review; Ch. 1.
week 2  9-7 to 9-11  ch. 2.1-2.3 Coulomb law, Gauss’ law, potential.
week 3  9-14 to 9-18  ch. 2.4-2.5 work & energy, conductors, capacitors.
week 4  9-21 to 9-25  ch. 3.1-3.2 Laplace equation, image method
week 5  9-28 to 10-2  ch. 3.3-3.4 solution methods; multipole expansions.
week 6  10-5 to 10-9  review; start ch. 4

**Exam 1: Weds. October 7 chapters 1-3**

week 7  10-12 to 10-16  ch. 4.1-4.2 Dielectrics, polarization.
week 8  10-19 to 10-23  ch. 4.3-4.5 Permittivity, dielectric constant, capacitor applications.
week 9  10-26 to 10-30  capacitors continues; introduction to magnetism.
week 10  11-2 to 11-6  ch. 5.1-5.2 Current, Lorentz Force, Biot-Savart law.
week 11  11-9 to 11-13  ch. 5.3-5.4 Ampere’s law, vector potential.
week 12  11-16 to 11-20  Magnetism applications, start ch. 6

**Exam 2: Weds. November 18**

week 13  11-23, 11-25  ch. 6.1-6.2 magnetism of matter

*Thanksgiving holiday, 11-26 to 27*

week 14  11-30 to 12-4  ch. 6.3-6.4 $H$ field; susceptibility.
week 15  12-7  Continuation, review.

**Final Exam Tuesday Dec. 15, 8:00 AM**

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