PHYS 304, Advanced Electricity and Magnetism I
Fall 2011 Syllabus
Department of Physics and Astronomy, Texas A&M University

Lectures: MWF, 11:30-12:20, room 213 Mitchell Physics Building (MPHY)

Instructor: J. H. Ross, Email: ross@physics.tamu.edu
  office: 448 MPHY (845-3842); lab: B03 ENPH (845-7823)
  course web-page: faculty.physics.tamu.edu/ross/304page.html
  office hours: MW 12:40-2:00, and T 4-5. I am usually available other times as well; email in advance if possible (and you are welcome to come to 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 material to be covered and corresponding chapters in Griffiths text. Exams are scheduled in the evening or in the standard TAMU time-slot for this course as pre-arranged.

week 1 8-29 to 9-2  Overview & Review; Ch. 1.
week 2 9-5 to 9-9  ch. 2.1-2.3 Coulomb law, Gauss’ law, potential.
week 3 9-12 to 9-16 ch. 2.4-2.5 work & energy, conductors, capacitors.
week 4 9-19 to 9-23 ch. 3.1-3.2 Laplace equation, image method
week 5 9-26 to 9-30 ch. 3.3-3.4 solution methods; multipole expansions.
week 6 10-3 to 10-7  review; start ch. 4

**Exam 1: Thurs. October 6, 8 PM – chapters 1-3**

week 7 10-10 to 10-14 ch. 4.1-4.2 Dielectrics, polarization.
week 8 10-17 to 10-21 ch. 4.3-4.5 Permittivity, dielectric constant, capacitor applications.
week 9 10-24 to 10-28 capacitors continues; introduction to magnetism.
week 10 10-31 to 11-4 ch. 5.1-5.2 Current, Lorentz Force, Biot-Savart law.
week 11 11-7 to 11-11 ch. 5.3-5.4 Ampere’s law, vector potential.
week 12 11-14 to 11-18 Magnetism applications, start ch. 6
week 13 11-21, 11-23 ch. 6.1-6.2 magnetism of matter

**Exam 2: Mon. November 21, 8 PM**

*Thanksgiving holiday, 11-24 to 25*

week 14 11-28 to 12-2 ch. 6.3-6.4 H field; susceptibility.
week 15 12-5 Continuation, review.

**Final Exam Monday Dec. 12, 10:30 AM**

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