

# Syllabus for Physics 100A – Electromagnetism

Fall 2011, Physics Department, UCSD

INSTRUCTOR: Congjun Wu (5430 MH)

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TA: Jhih-Sheng Wu TA email: jwu@physics.ucsd.edu TA office MHA5651

Time/Place: 10:00am - 10:50 am, M W F, PETER 102

Instructor Office hours: Thursday: 1:00-2:00 pm

TA office hour: Tuesday 2:00 - 3:00pm Problem session: Monday 4:00-4:45pm.

Text Books:

1. D. J. Griffiths, *Introduction to Electrodynamics*, Benjamin Cummings; 3 edition (January 9, 1999).

Reference Books

1. E. M. Purcell, *Berkeley Physics Course, Vol II*, McGraw-Hill (January 1, 1965).
2. R. P. Feynman, *Feynman's lecture notes on Physics, Vol II*, Addison Wesley Longman (June 1970).
3. J. D. Jackson, *Classical Electrodynamics*, Wiley; 3 edition (August 10, 1998).

Grade:

20% problem sets, 40% midterm, 40% final exam. There will be only one midterm in Physics 100B.

Homework Assignments:

Homework will be assigned every one or two weeks.

## Class Schedule

1. Vector analysis (6 classes)
  - Lecture 1: Vector algebra
  - Lecture 2: Differential calculus
  - Lecture 3: Integral calculus
  - Lecture 4: Curvilinear coordinates, delta function, theory of vector fields
2. Electrostatics (7 classes)
  - Lecture 4: Coulomb's law
  - Lecture 5: Gauss's law, divergence and curl of E
  - Lecture 6: Electric potential
  - Lecture 7: Work and energy
  - Lecture 8: Conductors
3. Special techniques of electrostatics (7-classes)
  - Lecture 8: Laplace's Equation
  - Lecture 9: The image method
  - Lecture 10: Separation of variables
  - Lecture 11: Multiple expansion
4. Electric fields in media (7-classes)
  - Lecture 12: Electric polarization
  - Lecture 13: The field of a polarized object
  - Lecture 14: The electric displacement
  - Lecture 15: Linear dielectrics