

PHY505 Classical Electrodynamics
Fall 2002
MWF 10:30-11:25 P112

Instructor:	William Weisberger	TA:	Gang Wang
Office:	MT6-112		C-123
Hours:	Mon., Wed. 3:00-4:00		Mon., Fri. 12:30-1:30
email:	william.weisberger@sunysb.edu		gawang@ic.sunysb.edu
phone:	2-7974		
fax:	2-7954		

Text: "Classical Electrodynamics, 3d Edition" by J.D. Jackson.
Examinations: Two midterm hour exams, three hour final exam.
Homework: Problem assignments approximately weekly to be graded.

SYLLABUS

1. Introduction to Maxwell Equations
2. Vector Analysis – Integral Theorems
3. Electrostatics
 - (a) Coulomb's Law & Basic Phenomenology
 - (b) Potential Theory
 - (c) Conductors – Equipotential Surfaces
 - (d) Forces & Stress Tensor
 - (e) Field Energy & Capacitance
 - (f) Multipole Expansion of Finite Charge Distributions
4. Dielectrics
 - (a) Macroscopic Equations & Boundary Conditions
 - (b) Boundary Value Problems
 - (c) Field Energy & Forces in Dielectrics

5. Magnetostatics & Steady State Current Flow
 - (a) Biot - Savart Law
 - (b) Lorentz Force Law
 - (c) Forces Between Currents & Units
 - (d) Magnetic Fields from Localized Current Distribution
 - (e) Force & Torque on Localized Current Distribution
 - (f) Macroscopic Magnetic Fields & Boundary Conditions
6. Quasi-stationary Phenomena - Magnetic Induction
7. Maxwell Equations
 - (a) Energy & Momentum Conservation
 - (b) Electromagnetic Waves
 - (c) Interface between Two Dielectric Media
 - (d) Propagations of Electromagnetic Waves in Conducting Medium
 - (e) Reflection by Plane Metallic Surface
 - (f) Skin Depth & Energy Loss in Conducting Walls

Addendum to Syllabus: If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, I would encourage you to contact the staff in the Disabled Student Services office (DSS), Room 133 in Humanities, phone 632-6748. DSS will review your concerns and determine with you what accommodations are necessary and appropriate. All information and documentation concerning disability is kept confidential.