

EEC 130A INTRODUCTORY ELECTROMAGNETICS

Winter 2007 (4 units)

Time: MW 12:10-2:00pm
Location: Olson 206
Instructor: Anh-Vu Pham
3141 Kemper Hall
Phone: 752-7472 and pham@ece.ucdavis.edu

Office Hours: MW 2:00-3:00pm or by appointment

Teaching Assistants: Mr. He Huang and Email: huanghe03@gmail.com
Office Hours: Tuesday 3-4pm in Kemper 1127

Class Web page: <http://my.ucdavis.edu>

Required Text Book: Fawwaz T. Ulaby, *Fundamentals of Applied Electromagnetics*, Prentice Hall, 2007, fifth edition.

Optional Text Book: D. K. Cheng, *Field and wave Electromagnetics*, Addison-Wesley, 1994.

Grading

Homework (weekly)	5%
Exams (2)	60%
Final Exam	35%

Exam: There will be no make-up exams. Students must notify the instructor a week in advance if he/she will miss an exam. The student must provide legitimate excuses in order to take an **oral** make-up exam to earn a grade.

Supplement Multimedia and Class Note

1. The book's CD
2. <http://www.amanogawa.com>
3. A dynamic transmission line model
4. Selected lecture notes will be available on the class web site.

Course Outline

~# of Lectures

1. Review of Phasors and traveling waves 1
2. Transmission Lines 4
 - Transmission line equations and lumped elements
 - Wave equation for transmission lines
 - Current and voltage waves – characteristic impedance
 - Reflection at unmatched loads
 - Input impedance, standing wave ratio
 - Shorted and open lines
 - Quarter wave matching
 - Power flow
 - Smith Chart
3. Electrostatics 5
 - Charge and current distributions
 - Coulomb's Law
 - Gauss's Law
 - Electric Scalar Potential
 - Electrical Properties of Materials
 - Conductors/Dielectric
 - Electric Boundary Conditions
 - Capacitance
 - Electrostatic Potential Energy
4. Magnetostatics 4
 - Law of Biot and Savart, magnetic flux density
 - Stokes Theorem, Ampere's Law
 - Boundary Conditions
 - Inductance
5. Time-varying Fields and Maxwell's equations 1
 - Faraday's Law
 - Displacement current, continuity equation
 - Boundary conditions
 - Maxwell's equations
6. Planes Waves 3
 - Electromagnetic plane waves
 - Polarization
 - Poynting's Vector, Power flow notes
7. Reflection of Plane Waves 1
 - Normal incidence
 - Electromagnetics of transmission lines