

## ELEG 3703 ELECTROMAGNETICS I

Spring Semester 2000

- Catalog Data: 2000-01      Analysis of transmission lines with sinusoidal and transient excitation. Development and use of the Smith Chart and methods of impedance matching. Vector analysis, static form of Maxwell's equations, electrostatics and magnetostatics. Prerequisite: PHYS 2073, MATH 2574.
- Textbook:      Fundamentals of Applied Electromagnetics, 1999 edition, Fawwaz T. Ulaby, Prentice-Hall.
- References:     Electromagnetics with Applications, 5<sup>th</sup> edition, John D. Kraus and Daniel A. Fleisch, McGraw-Hill, 1999.
- Coordinator:    William P. Waite, Professor of Electrical Engineering.
- Goals:          To have students become familiar with traveling waves and their treatment on transmission lines. To introduce students to static electric and magnetic fields, potential functions, and the effect of material properties on these fields. The use of vector calculus methods for solution of static field problems.

### Prerequisite by Topic:

1. Integral and differential calculus.
2. Line, surface, and volume integration.
3. Three-dimensional vector algebra.
4. Classical atomic models of elements and materials.

### Topics:

1. Traveling waves. (4 classes\*)
2. Transmission lines. (12 classes)
3. Vector analysis. (8 classes)
4. Electrostatics. (8 classes)
5. Magnetostatics. (8 classes)
6. Test. (2 classes)

### Computer Usage:

Two homework assignments on transmission lines require the downloading of programs from the world wide web and their use for determination of line input impedance and line matching.

### Estimated Content:

Engineering Science: 2.5 credits.  
Engineering Design: 0.5 credit.

\* Three 50 minute classes per week.

Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_