Course Outline for ENGR 450: Electromagnetic Waves

Elective
Electrical Engineering

Bulletin Description
ENGR 450  Electromagnetic Waves (3 units)
Prerequisite: A grade of C or better in ENGR 308 and ENGR 350

Textbook

References:

Coordinator
Todor Cooklev, Assistant Professor of Electrical Engineering

Prerequisites by Topic
1. Knowledge of vector calculus
2. Knowledge of electrostatics
3. Knowledge of magnetostatics
4. Electric circuit theory

Course Objectives
1. Ability to utilize advanced mathematics and general scientific principles to identify, formulate, and solve practical electromagnetic engineering problems. [A.1, A.2]
2. Ability to use modeling tools to solve electromagnetic wave problems. [B.3]

Topics
1. Introduction
2. Transmission lines
3. Maxwell’s equations for time-varying fields
4. Plane wave propagation
5. Wave reflection, transmission and geometric optics
6. Antennas
7. Satellite communication systems and radar sensors

Professional Component
Engineering Science 67%
Engineering Design 33%

Evaluation
1. Two midterm tests 40%
2. Final exam 40%
3. Weekly homework assignments 20%

Performance Criteria

Objective 1
1.1 The student will demonstrate an ability to analyze and design waveguides and resonators. [1, 2, 3]
1.2 The student will demonstrate an ability to analyze electromagnetic wave propagation modes. [1, 2, 3]

Objective 2

1 Numbers in brackets refer to the educational objectives and outcomes of the School of Engineering.
2 Numbers in brackets refer to the evaluation methods used to assess student performance.
2.1 The student will demonstrate ability to model transmission line structures using an electromagnetic field solver. [3]

Fall Semester, 2003
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Class/Laboratory Schedule
Three 50-minute lecture sessions/week

Prepared by
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