

## **ECE 3342: Electromagnetic Theory II**

**Credit / Contact hours:** 3 / 3

**Course coordinator:** Mohammad Saed

**Textbook(s) and/or other required material:** Inan & Inan, *Electromagnetic Waves*, Prentice Hall 2000.

**Catalog description:** General solutions for Maxwell's equations. Traveling waves in scalar media. Boundary conditions and constraints imposed by bounding surfaces.

**Pre-requisite(s) or co-requisites:** ECE 3341 and MATH 3351.

**Designation:** Required

**Course learning outcomes:** Upon completion of this course, students should be able to do the following:

1. Analyze time varying fields problems using Maxwell's equations.
2. Analyze plane waves in lossless media.
3. Analyze time varying fields problems applied to plane waves in lossy media.
4. Analyze time varying fields applied to waves interacting with boundaries.
5. Apply these techniques to guided waves.

**ABET Student Outcomes addressed:** a, e, and k.

### **Topics covered:**

Time varying fields and Maxwell's equations - 7 hours

Waves in unbounded lossless media - 5 hours

Waves in unbounded lossy media - 5 hours

Waves interacting with planar boundaries - 5 hours

Guided waves - 12 hours

Special topics in electromagnetics - 4 hours

Test and reviews - 4 hours