Department: Electrical and Computer Engineering

**EEL3473 — Electromagnetic Fields II**

**Curriculum Designation:** Selective Elective for EE majors. Elective for CpE majors.

**Course (Catalog) Description:** Maxwell’s equations, plane electromagnetic waves, group velocity, polarization, Poynting vector, boundary conditions, reflection and refraction of plane waves, skin effect, transmission line analysis, impedance matching, waveguides and cavity resonators, fundamentals of radiation and antennas.

**Prerequisite:** EEL3472

**Textbooks/Required Materials:** Electromagnetics for Engineers (w/CD), Author: Ulaby, Publisher: Prentice Hall, Copyright Year: 2005

**Course Objectives:**
1. Identify and explain the phenomena involving transformer and motional induction such as time-varying fields in a loop and loops moving through a field.
2. Identify and explain the phenomena involving electromagnetic wave propagation such as plane waves in various media, reflection and refraction, and boundary conditions.
3. Identify and explain the phenomena of transmission lines such as propagation speed, characteristic impedance and distributed parameters of transmission lines, and impedance matching.
4. Identify and explain the fundamentals of antennas and radiation.

**Topics covered:**
1. Maxwell’ equations, Faraday’s law, transformer and motional emf.
2. Electromagnetic wave propagation, boundary conditions, Poynting vector, reflection and transmission.
3. Transmission lines, impedance, SWR, Smith Chart.
4. Waveguides, modes of propagation, and characteristic impedance..

**Class Schedule:** Two 75 minute lectures per week (3 credit hours).

**Subject Area:** Engineering

**Significant Design:** No

**Relationship to Assessed ABET Student Outcomes:** None

**Last Updated by:** Rajendra Arora

**Date:** April 10, 2021