Department: Electrical and Computer Engineering

EEE 4435L — Electromagnetic Fields Laboratory

Curriculum Designation: Laboratory elective for EE majors.

Course (Catalog) Description: This course focuses on the applications of electromagnetic field theory. Experiments include field mapping, transmission lines, spectrum analysis, impedance matching, waveguides, antennas, radar, and fiber optics.

Prerequisite: EEL 3473 Electromagnetic Fields II

Textbooks/Required Material: Online Lab Manual

Course Objectives:
1. Measurement, mapping, and calculation of electrostatic fields.
2. Spectrum analysis of various signal modulation schemes.
3. Measurement and calculation of various transmission line metrics.
4. Determination of unknown load impedance.
5. Antenna simulation and measurement.
7. Measurement of scattering (S) parameters for various components at RF/uW frequencies.

Topics covered:
1. Getting started with ADS
2. Basic equipment: oscilloscope, function generator, spectrum analyzer, network analyzer
3. Electrostatic fields
4. Pulses on transmission lines
5. ADS: Spectrum analysis
6. Vector network analyzer: Calibration and measurements
7. ADS: Spectrum analysis
8. ADS: Microstrip line
9. ADS: Linear networks
10. ADS: Resonant circuits
11. Microwave experiments

Class Schedule: One 165 minute lab per week (1 credit hour).

Subject Area: Engineering

Significant Design: No

Relationship to Assessed ABET Student Outcomes: None

Last Updated by: R.J. Perry       Date: April 30th, 2021