ECE4360 Course Syllabus

ECE4360

RF-Microwave Measurement Laboratory (1-3-2)

CMPE Degree

This course is Elective for the CMPE degree.

EE Degree

This course is Elective for the EE degree.

Course Coordinator

Tentzeris,Emmanouil M

Prerequisites

(ECE 3065 or ECE 4350) and ECE 4415* * Prerequisites indicated with an asterisk may be taken concurrently with ECE4360

Corequisites

None

Catalog Description

RF/microwave measurement theory and techniques. Use of state-of-the-art equipment operating into the GHz range.

Textbook(s)

No Textbook Specified.

Student Outcomes

In the parentheses for each Student Outcome:
"P" for primary indicates the outcome is a major focus of the entire course.
“M” for moderate indicates the outcome is the focus of at least one component of the course, but not majority of course material.
“LN” for “little to none” indicates that the course does not contribute significantly to this outcome.

1. (LN) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. (LN) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. (LN) An ability to communicate effectively with a range of audiences
4. (LN) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. (LN) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. (LN) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. (LN) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topical Outline

- Smith Chart
- Two-Port Microwave Networks
  - S-Parameters
  - Mason Rules
- Network Analyzer Concepts
  - Slotted Line Measurements
  - Measurement Theory
  - Calibration Techniques
- Passive Component Measurements
  - Matching Networks
  - Filters
- Spectrum Analyzer Concepts
  - Frequency Generation
  - Noise
- Active Component Measurements
  - Amplifiers
  - Oscillators
- Antenna Measuremnts