ECE 4341: Microwave Engineering

Credit / Contact hours: 3 / 3

Course coordinator: Mohammad Saed

Textbook(s) and/or other required material: David M. Pozar, Microwave Engineering, 4th edition, John Wiley 2012.

Catalog description: Analysis and design of microwave passive components, including transmission lines, waveguides, resonators, hybrids, couplers, attenuators, filters, circulators, switches, and phase shifters.

Pre-requisite(s) or co-requisites: ECE 3342.

Designation: Elective

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

1. Analyze and design transmission line matching circuits.
3. Analyze and design resonators, power dividers, and directional couplers.
4. Analyze and design microwave filters.
5. Analyze ferrite components.

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

Topics covered:

Review of electromagnetic theory and transmission line theory – 2 hour
Waveguides, coaxial and planar transmission lines – 4 hours
S-parameters – 2 hour
Microwave network analysis – 3 hours
Impedance matching – 7 hours
Microwave resonators – 3 hours
Power Dividers, directional couplers, and hybrids – 7 hours
Microwave filters – 9 hours
Ferrite Components: isolators, phase shifters, circulators – 5 hours