

EEL 5437 Microwave Engineering

Credits: 3 credits

Textbook, Title, Author, and Year: Microwave Engineering, 4th ed., D. M. Pozar, Wiley, 2012

Reference Materials: Microwave Engineering Class-Notes, Rev. '12, J. Bagby, available on Blackboard

Specific Course Information

Catalog description: Review of electromagnetics, transmission lines, waveguides, microwave network analysis, impedance matching and tuning, microwave resonators, microwave power dividers, couplers and filters, microwave oscillators and mixers, CAD design techniques.

Prerequisites: EEE 3300 Electronics 1, EEL 3470 Electromagnetic Fields and Waves

Specific Goals for the Course: To provide students with a firm foundation in microwave engineering and design techniques. Design considerations include transmission lines and waveguides, network analysis, impedance matching and tuning, microwave resonators, power dividers, couplers, filters, oscillators and mixers, and use of CAD software packages.

Brief List of topics to be covered:

1. Introduction to microwave engineering
2. EM plane waves
3. Conventional transmission lines
4. Parallel plate waveguide
5. Rectangular waveguide
6. Circular waveguide
7. Coaxial waveguide
8. Dielectric slab waveguide
9. Metallic strip waveguides
10. Wave velocities and dispersion
11. Microwave network modal analysis
12. Excitation of waveguides
13. Impedance matching and tuning
14. Theory of small reflections
15. Multisection transformers
16. Transmission line resonators
17. Cavity resonators
18. Cavity perturbations