University of Wisconsin - Madison
College of Engineering [EGR]
Last Offered: 2011-2012 Spring [1124]
Direct Link to this Syllabus:

1. E C E 444, Microwave Devices and Applications
2. Credits: 3    Contact Hours: 3.0
3. Textbook and Materials:


   a. Other Supplemental Materials: None

   • Specific Course Information:

   a. Brief description of the content of the course (Course Catalog Description):
      Advanced analysis of waveguides, stripline, and microstrip; microwave circuit and device
      theory including ferrites, junctions and resonators; high frequency generation and
      amplification, microwave systems.

   b. Pre-requisites or Co-requisites: ECE 265 and 273

   c. This is a Selected Elective course.

   • Specific Goals for the Course:

   a. Course Outcomes:

      1. To give students an understanding of basic microwave devices and the necessary
         background to perform simple design of microwave circuits.

   • ABET Student Learning Outcomes:

      (a) Ability to apply mathematics, science and engineering principles.
      (b) Ability to design and conduct experiments, analyze and interpret data.
(c) Ability to design a system, component, or process to meet desired needs.
(e) Ability to identify, formulate and solve engineering problems.
(g) Ability to communicate effectively.
(h) The broad education necessary to understand the impact of engineering solutions in a
    global and societal context.
(i) Recognition of the need for and an ability to engage in life-long learning.
(j) Knowledge of contemporary issues.
(k) Ability to use the techniques, skills and modern engineering tools necessary for
    engineering practice.

- **Brief List of Topics to be Covered:**
  1. Dielectric heating and microwave ovens, safety standards.
  2. Guided wave propagation in rectangular and circular waveguides and guides of
     arbitrary cross section.
  4. Microwave resonators.
  5. Stripline and microstrip components and circuits.
  6. Microwave active devices.
  7. Ferrites and nonreciprocal devices.
  8. Microwave systems and demonstrations (Doppler radar, microwave relay systems,
     microwave network analyzer, etc.).