THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Microwave Electronics

ECE 5027

Credit Hours:
4.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Course Components:
Lecture
Lab

Course Description:
Design principles of microwave transistor amplifiers and oscillators; low-noise, power and broadband amplifiers; linearization; computer-aided design; microstrip realizations and testing in the laboratory.

Prerequisites and Co-requisites:
Prereq: 3020 (323), and enrollment in ECE major; or Grad standing in Engineering, Biological Science, or Math and Physical Sciences.

Course Goals / Objectives:
- Give the student a comprehensive introduction to the design microwave amplifier and oscillator circuits
- Introduce the student to the concepts of nonlinear RF measurements, modeling and circuit design
- Introduce the use of CAD tools to verify the microwave amplifier and oscillator designed, account for real world implementation effects, and optimize the circuits designed
- Expose the students to the measurements of amplifiers and oscillators at microwave frequencies using a network analyzer, a noise meter, a spectrum analyzer and a vector signal analyzer
- Involve the students in a team oriented design project where they design, fabricate, and test a microwave amplifier or oscillator circuits and present their results to the class

Course Topics:

- Linear and nonlinear representations of active devices
- Matching networks and signal flow graphs
- Microwave transistor amplifier design theory
- Noise, broadband, and high-power design methods
- Microwave transistor oscillator design
- Nonlinear RF measurement, modeling and circuit design
- Linearization of amplifiers and modulators
- Design, simulation, fabrication and testing a microwave electronic circuit

---

Designation:

Elective