

## **ECE 4323: Modern Communications Circuits**

**Credit / Contact hours:** 3/3

**Course coordinator:** Brian Nutter

**Textbook(s) and/or other required material:**

Rhode, Whitaker, Bucher, *Communications Receivers*, McGraw Hill, current edition.  
Other current material used as supplements.

**Catalog description:** ECE 3312 and ECE 3323. For majors only or departmental consent.  
Analysis and design techniques for modern communication circuits.

**Pre-requisite(s) or co-requisites:** ECE 3312 and ECE 3323

**Designation:** Elective

**Course learning outcomes:** Upon completion of this course students should be able to analyze and design communication circuits, systems and components. This course prepares students for engineering practice by familiarizing them with analysis and design techniques for components and systems for RF communications. This includes exposure to specifications of currently available integrated circuit subsystems.

**ABET Student Outcomes addressed:** EE and CMPE Program Outcomes a, c, e, and k.

**Topics covered:**

1. Behavior of transistors at high frequency - 2 hours
2. Impedance matching and frequency selective networks – 4 hours
3. Radio frequency signal paths – 1 hour
4. Noise and Signal to Noise Ratio – 3 hours
5. Signal distortion and Intermodulation Distortion – 4 hours
6. High Frequency Amplifiers – 4 hours
7. Gain budgets and gain control – 2 hours
8. Oscillators – 6 hours
9. Voltage Controlled Oscillators - 4 hours
10. Phase-Locked Loops – 5 hours
11. Mixers – 2 hours
12. Transmitters, Modulation, and Demodulation – 2 hours
13. Exams and reviews – 3 hours