



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Communications Laboratory

ECE 5007

Credit Hours:

0.50

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lab

Course Description:

A laboratory in digital data communication implementing a software-defined modem: quadrature modulation; phase-shift keyed modulation; inter-symbol interference; timing and frequency recovery.

Prerequisites and Co-requisites:

Prereq or concur: 5000 (501), and enrollment in ECE or EngPhysics major; or Grad standing in ECE.

Course Goals / Objectives:

- Master concepts of sampling, aliasing, filtering, and quadrature modulation through implementation of software-defined modulation and demodulation.
 - Master signal space representation of digital modulation for phase-shift keying.
 - Be competent with timing and frequency recovery as examples of combating channel impairments.
 - Students should advance to competency their skills in creating structured software, debugging, and experimentation.
 - Students should demonstrate design competence via integration of processing steps to arrive at a working packet-based acoustic digital modem.
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Course Topics:

- Introduction: signals and systems
 - Quadrature modulation
 - Digital modulation
 - Pulse shaping and inter-symbol interference
 - Synchronization
 - Frequency recovery
 - Acoustic modem demonstration
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Designation:

Elective