Electrical and Computer Engineering
MSE Concentration in Communications

Introduction

The focused MSE in Communications provides specialized study in communications systems and techniques. Courses in Systems, Communications, and Signal Processing area are augmented by studies in the Photonics program for the student interested in optical communications. Appropriate courses from the Departments of Computer Science and Applied Mathematics and Statistics may be taken as well. Laboratories available for student projects include the Telecommunications Instructional Modeling System in the Basic Communications Laboratory and the ECE Software Radio Prototyping Laboratory, both in Barton Hall.

General Requirements

Satisfy the following requirements:

- Completion of eight one-semester graduate courses (400-799 level), and
- Completion of two additional graduate courses or a master’s essay, or special research project approved by an ECE faculty member.

List of ECE Courses Relevant to the Concentration

520.402 Digital Communications (Davidson)
520.407 Introduction to the Physics of Electronic Devices (Khurgin)
520.435 Digital Signal Processing (Weinert)
520.443 Digital Multimedia Coding and Processing
520.445 Audio Signal Processing (Elhilali)
520.447 Introduction to Information Theory & Coding (Khudanpur)
520.459 Quantum Mechanics for Engineering (Dean Schlesinger)
520.611 Ultrafast Optical Phenomena (M. Foster)
520.612 Advanced Fiber Optics and Devices
520.645 Adaptive Filtering (Tran)
520.646 Wavelets and Filter Banks (Tran)
520.648 Compressed Sensing and Sparse Recovery (Tran)
520.651 Random Signal Analysis (Khudanpur)
520.652 Filtering and Smoothing (Weinert)
520.735 Sensory Information Processing (Andreou)

Relevant Courses in Other Departments

Applied Mathematics and Statistics
550.420 Introduction to Probability
550.426 Introduction to Stochastic Processes
550.430 Introduction to Statistics
Computer Science
600.424 Network Security
600.437 Distributed Systems
600.442 Modern Cryptography
600.444 Computer Networks
600.450 Network Embedded Systems & Sensor Networks
600.467 Wireless Networks
600.644 Advanced Computer Networks
600.647 Advanced Topics in Wireless Networks
600.667 Advanced Distributed Systems and Networks
600.670 Pseudorandomness and Combinatorial Constructions

ECE Activity in Communications

Core Faculty

- Professor Andreas G. Andreou
- Associate Research Professor A. Brinton Cooper
- Professor Frederic Davidson
- Professor Howard Weinert
- Professor Trac D. Tran

Research Activity

- Phase-encoded optical code division multiple access
- Fast decoders for algebraic error control codes
- Dynamic radio spectrum sensing
- Chaotic fiber optic communications
- Advanced communications concepts for data center networks
- Software defined radio
- Signal representation, signal decomposition, time-frequency & time-scale analysis theoretical and experimental optical communications

Contact Information

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