ECE 54300 - Wireless Communication Networks

Type of Course
Elective for the CmpE and EE programs

Catalog Description
Provides an overview on the protocols and architectures of existing and emerging wireless networks. Specifically, this course involves the study of wireless networks working with existing protocols and new proposed protocols that are more suitable to the particular characteristics of the wireless technology. Protocols for medium access control, routing, and reliable transport, as well as middleware and applications for wireless networks, are covered.

Credits
Cr. 3.

Dual Level, Undergraduate-Graduate

Contact Hours
3

Prerequisite Courses
ECE 42800 and senior or graduate standing in either an engineering or science degree program.

Textbook
Fundamentals of Wireless Communications, by David Tse and Pramod Viswanath . Publisher: Cambridge University Press, 2005. (ISBN-10: 0521845270, ISBN-13: 978-521845274)

Course Objectives
Provide a good understanding of:

1. The basic principles of wireless communications
2. How reflection, diffraction, and scattering contribute to path-loss
3. The modeling of wireless channels
4. How to compute path-loss with different path-loss models
5. The difference between fast vs slow fading channels
6. The difference between frequency-selective vs frequency flat channels
7. Basics of linear communications, in particular linear modulation
8. Spread Spectrum and RAKE receivers
9. Multiple antenna and space-time communications
10. Fundamentals of cellular communications systems

11. Ad-hoc wireless networks

Lecture Topics

1. Overview of wireless communications
2. Path-loss shadowing
3. Wireless channels models
4. Basic digital modulation techniques over wireless channels
5. Multicarrier modulation and OFDM
6. Spread spectrum
7. Fundamentals of cellular networks
8. Ad-hoc wireless networks
9. Wireless standards

Computer Usage

Medium

Laboratory Experience

None

Design Experience

None

Coordinator

TBD

Date

03/02/2018