THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Introduction to Wireless Networking

ECE 5101

Credit Hours:
3.00

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

Course Components:
Lecture

Course Description:
Fundamental concepts in cellular design, Wireless-LANs, MANETs, and sensor networks will be explored. Specific topics will include propagation, fading, cellular-design, power-management, routing, scheduling, and control.

Prerequisites and Co-requisites:
Prereq: 3561 (561) or CSE 3461 (677), or Grad standing in Engineering or Math and Physical Sciences.

Course Goals / Objectives:
- Be exposed to basics of propagation and fading
- Be familiar with notions of SINR and cell design, as well as notions of handoffs and channel allocation.
- Be familiar with different forms of multi-access systems (FDMA, CDMA, TDMA, OFDMA, etc.).
- Be familiar with power management and current implementations in cellular systems.
- Be familiar with routing and current implementations in both cellular.
- Be familiar with cellular scheduling as well as be exposed to scheduling in multi-hop networks.
- Be familiar with various wireless systems such as cellular, Wireless LAN, sensor, mobile ad hoc, sensor, etc.
- Be exposed to some major issues facing the design of future wireless systems.

Course Topics:

- Historical milestones and current wireless networks
- Understanding the wireless communication channel
- Multiple access techniques (FDMA, TDMA, CDMA)
- Concept of cellular communications, handoff, and location management
- Power control
- Opportunistic scheduling for cellular networks and extensions to multi-hop networks
- Proactive and reactive routing
- Congestion control
- System case studies (802.11, Bluetooth, etc.)
- Energy management in sensor networks

Designation:

Elective