INF-274 Wireless Networking introduces networking students to the wireless networking technology. Student learns wireless theory and how to apply it to modern networks. Course includes radio frequency fundamentals, wireless antennas and access, configuring, managing and securing a wireless network.
3 Hours Lect, 3 credits
Prerequisite: INF-160

Student Learning Objectives
As a result of meeting the requirements of this course student will be able to:
- Create a Wireless LAN
- Apply basic radio theory
- Secure a wireless network
- Troubleshoot and repair a wireless network
- Perform a site survey

Course Content
This is an entry level course in basic wireless networking theory. The student will learn basic radio theory and the details of the latest wireless protocols. The goal is to be able to manage a wireless LAN infrastructure and maintain a wireless network that is cost effective reliable and secure.

Course Text
CWNA Guide to Wireless LANs 3rd Edition
By Mark Ciampa
Pub: Course Technology

Grading Policy
- Exam 1 20%
- Exam 2 20%
- Exam 3 20%
- Exam 4 20%
- Project 20%
**Attendance/Lateness policy**

All students are expected to attend punctually every scheduled meeting of each course in which they are registered. Attendance and lateness policy sanctions are to be determined by the instructor for each section of the course. These will be established in writing on the individual course outline. Attendance will be kept by the instructor.

**Course Schedule**

| Week 1     | Chap 1 World of Wireless  |
|           | Wireless Applications     |
|           | Types of Wireless Networks|
|           | Wireless Organizations    |

| Week 2     | Chap 2 Wireless Local Area Networks |
|           | Understanding Standards         |
|           | Wireless LANs – 802.11n         |
|           | WLAN Hardware and Software      |

| Week 3     | Chap 3 Radio Frequency Fundamentals |
|           | RF basics                        |
|           | Wavelength                       |
|           | Frequency                        |
|           | Amplitude                        |
|           | Phase                            |
|           | RF Range and Speed               |
|           | Line of sight                    |
|           | Interference                     |
|           | RF behavior                      |
|           | Measure RF                       |
|           | Absolute power                   |
|           | Relative power                   |

| Week 4     | Chap 4 WLAN Antennas             |
|           | Basic RF Antenna Concepts        |
|           | RF lobes, beam width, antenna gain |
|           | WLAN Antenna types               |
|           | Omnidirectional, highly directional |
|           | Antenna Coverage                 |
|           | Multiple Input Multiple Output    |
|           | Antenna Installation             |

| Week 5     | Chap 5 Physical Layer Standards  |
Narrow Band
Spread Spectrum
802.11a
802.11b
802.11g
802.11n

Week 6  Chap 6 Media Access Control Layer
WLAN Service Sets
802.11 Mac Layer Frame Formats
MAC Operations

Week 7  Chap 7 WLAN Management
Autonomous Access Point Architecture
Controller Based Architectures
Multiple Channel Architecture vs
Single Channel Architecture
Wireless Network Management Systems

Week 8  Chap 8 Conducting a Site Survey
What is a Site survey
Size, Number of users
Site Survey Tools
Procedures for Conducting a Site Survey

Week 9  Chap 9 Wireless LAN Security
Wireless Attacks
Legacy 802.11 Security
Vulnerabilities of 802.11

Week 10  Chap 10 Implementing Wireless LAN Security
WLAN Security
SSID, MAC Filtering
Authentication and encryption
802.1x, WEP, TKIP, CCMP
VPN
PPTP, L2TP

Week 11  Chap 11 Managing a Wireless LAN
Procedural Security Defenses
Monitoring the Wireless Network
Maintaining the Wireless Network

Week 12  Chap 12 Wireless Troubleshooting
Identifying Wireless Problems
Transmitting, receiving, no connectivity, thruput
Optimizing Wireless Networks
   Infrastructure
   Load balancing
   Multipath
   Hidden Node

Week 13  Chap 13 Other Wireless Networks
   Wireless Personal Area Networks – 802.15
   Bluetooth
   UltraWideband
   Wireless Metropolitan Area Networks
   Wireless Wide Area Networks

Week 14  Review

Week 15  Exam