

NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY

ITN 120

WIRELESS – NETWORK ADMINISTRATION (W-NA) (3 Cr.)

Course Description

Provides instruction in understanding, planning installing, using, configuring, managing, and troubleshooting wireless LANs. Explores the fundamentals of radio frequency, spectrum technologies, signaling multiplexing, and demultiplexing. Discusses access in the wireless medium using IEEE 802.11 wireless standards, wireless NICs, Wireless Access Point, IP addressing, and Mobil IP. Talks about security, IP protocols, CISCO Access Point configuration, management, troubleshooting, and security. Lecture 3 hours per week.

Recommended Co-requisites or Pre-requisites

Prerequisite: ITN or ITN 101. Students must be able to read and write at a college level.

Course Objectives

Upon completion of this course, the student will be able to:

- Explain OSI model protocol layering
- Explain Wireless LANs fundamentals
- Explain differences between upper and lower protocols
- Explain IP addressing and subnet operation
- Explain in detail physical layer standards
- Explain how to build a secure WLAN
- Explain how to install wireless NIC adapters
- Explain installation and setup of Access Point
- Implement Security
- Implement and use Wireless network monitoring tools

Course Content

- OSI, and TCP/IP model
- Today's Wireless LANs
- Wireless LANs fundamentals
- Analog and digital transmission
- Wireless signal multiplexing
- Packets and frames
- IEEE 802.11 Physical layer standards
- IEEE 802.11 Medium Access Control
- IP addressing
- Build a secure WLAN
- Configuring a WLAN
- WLAN Monitoring
- WLAN troubleshooting

Student Learning Outcomes

OSI, and TCP/IP model

- The need and benefits of standards
- Layering concept
- Peer to Peer connectivity
- TCP/IP de facto standard

Today's Wireless LANs

- WLANs application
- Advantages and disadvantages

Wireless LANs fundamentals

- Radio-based WLANs
- Radio waves
- Radio Frequencies
- Transmissions
- Components
- Modes
- Light-based WLANs
- Coding signals
- Infrared Light

Analog and digital transmission

- Analog transmission
- Digital transmission
- Error free digital transmission
- Broadband and baseband transmission

Wireless signal multiplexing

- Frequency Division Multiplexing
- Time Division Multiplexing
- Statistical Time Division Multiplexing

Packets and Frames

- TCP/IP traffic (packets)
- Ethernet (frames)
- ARP
- Ping
- Tcpdump

IEEE 802.11 Physical layer standards

- Frequency Hopping spread spectrum PHY specification
- Direct sequence spread spectrum PHY specification
- Diffused infrared PHY specifications

IEEE 802.11 Medium Access Control

- Access to a wireless medium
- Joining and keeping connected to a wireless network
- MAC frame format

IP addressing

- IP address
- Sub-netting
- Special IP numbers
- Masking
- Mobil IP

Build a secure WLAN

- Assessing needs
- WLAN design
- Peer to peer versus Infrastructure Mode
- Coverage area
- Number of users
- Determining security

Configuring a WLAN

- Install Wireless NIC adapters
- Load drivers and utilities
- Configure Windows for the network
- Configuring Cisco WLAN
- Installing the Access Point

- Configuring the network
- Starting up a WLAN

WLAN Monitoring

- Standard network monitoring tools
- Station utilities
- Access point utilities
- Modify the AR Radio Settings

WLAN troubleshooting

- Network connection settings
- WLAN Alerts
- Cisco Alerts