



Course Description

CNT3526C | Wireless and Mobile Networking | 4.00 credits

This is upper division course for students majoring in Information Systems Technology introduces students to wireless and mobile network architecture, protocols and technologies. The student will learn about Wireless Local Area Networks (WLANs), Wireless Personal Area Networks (WPANs) and Wireless Metropolitan Area Networks (WMANs) technologies. Other topics include antenna concepts, cellular networks, the 802.11 network architecture, and wireless security. Prerequisite: CTS1134 or CTS1650.

Course Competencies:

Competency 1: The student will demonstrate an understanding of the various types of wireless communications technologies by:

1. Identifying the various types of wireless communications technologies
2. Explaining the advantages of wireless communications technology
3. Discussing the challenges of wireless communications technology

Competency 2: The student will demonstrate an understanding of wireless data transmission by:

1. Discussing the two types of wireless transmission
2. Explaining the properties of a wave, such as amplitude, wavelength, frequency, and phase
3. Identifying the basic concepts and techniques related to the transmission of data by radio waves
4. Explaining spread spectrum transmissions

Competency 3: The student will demonstrate an understanding of radio frequency communications by:

1. Identifying the essential components of a radio system
2. Describing the major telecommunications standards organizations
3. Explaining the radio frequency spectrum

Competency 4: The student will demonstrate an understanding of antennas by:

1. Defining decibels, gain, and loss
2. Explaining how antennas work
3. Listing different antenna types, shapes, sizes, and applications
4. Explaining RF signal strength and direction

Competency 5: The student will demonstrate an understanding of Wireless Personal Area Networks (WPANs) by:

1. Defining a wireless personal area network (WPAN)
2. Listing the IEEE 802.15 WPAN standards and their applications
3. Explaining how Bluetooth and ZigBee RF WPANs work
4. Describing some of the security features and threats in WPAN technologies

Competency 6: The student will demonstrate an understanding of Wi-Fi Wireless Local Area Networks (WLANs) by:

1. Identifying the components of a WLAN
2. Describing the modes of operation of a WLAN
3. Discussing the first IEEE WLAN standards
4. Describing coordinating communications in RF WLANs
5. Explaining the process of association and reassociation
6. Outlining the power management features of IEEE 802.11 networks
7. Discussing 802.11 MAC frame formats

Competency 7: The student will demonstrate an understanding of WLAN performance by:

1. Explaining how IEEE 802.11g enhances 802.11b networks
2. Outlining how IEEE 802.11a works and how it differs from 802.11 networks
3. Discussing IEEE 802.11n and how it functions in both the 2.4 GHz and 5 GHz bands
4. Describing the IEEE 802.11ac and 802.11ad amendments
5. Listing other necessary current and future amendments to 802.11

Competency 8: The student will demonstrate an understanding of WLAN security by:

1. Discuss how wireless bridges and repeaters can expand the functionality of WLANs
2. Describing how wireless controllers can simplify the management of WLANs
3. Discussing WLAN design considerations
4. Explaining how Wi-Fi Direct can make it easier for end users to share resources, synchronize devices, and connect directly
5. Describing developments in the use of WLANs in multimedia distribution
6. Listing the security features and challenges of IEEE 802.11 networks and how to manage them

Competency 9: The student will demonstrate an understanding of Wireless Metropolitan Area Networks (WMANs) by:

1. Defining wireless metropolitan area networks (WMANs)
2. Describing various land-based fixed broadband wireless technologies, including Free Space Optics (FSO), microwave, and WiMAX
3. Explaining IEEE 802.16 (WiMAX) standards, applications, and protocols
4. Outlining the security features of WMANs

Competency 10: The student will demonstrate an understanding of Wireless Wide Area Networks (WWANs) by:

1. Explaining the basic concepts of cellular telephony and how it works
2. Discussing the various generations and evolution of cellular telephony
3. Discussing satellites and their application in WWANs

Competency 10: The student will demonstrate an understanding of Radio Frequency Identification and Near Field Communication by:

1. Explaining radio frequency identification (RFID) and near-field communication (NFC)
2. Listing the components of an RFID or NFC system
3. Describing how RFID and NFC work
4. Explaining the challenges and security considerations of RFID and NFC

Learning Outcomes:

- Solve problems using critical and creative thinking and scientific reasoning
- Use computer and emerging technologies effectively
- Demonstrate knowledge of ethical thinking and its application to issues in society