

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

CITA 260 - INTRODUCTION TO WIRELESS TECHNOLOGY

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**CANINO SCHOOL OF ENGINEERING TECHNOLOGY
DECISION SYSTEMS
FALL 2018**

- A. **TITLE:** Introduction to Wireless Technology
- B. **COURSE NUMBER:** CITA 260
- C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

Credit Hours: 3
 # Lecture Hours: 3 per week
 # Lab Hours: per week
 Other: per week

Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** No

E. **GER CATEGORY:** None

F. **SEMESTER(S) OFFERED:** Spring

G. **COURSE DESCRIPTION:** This course introduces various aspects of wireless technology including wireless networks, authentication, protocols, security, installation considerations, and standards. Projects to determine signal strengths from different antenna types and locations are assigned.

H. **PRE-REQUISITES/CO-REQUISITES:**

- a. Pre-requisite(s): CITA 220 Data Communications and Network Technology
- b. Co-requisite(s): none
- c. Pre- or co-requisite(s): none

I. **STUDENT LEARNING OUTCOMES:**

By the end of this course, the student will be able to:

<u>Course Student Learning Outcome</u> <u>ISLO</u>	<u>PSLO</u>	<u>ISLO</u>
a. Define concepts of radio frequency communications as they apply to contemporary spread spectrum wireless networks including 802.11, Bluetooth, Home RF, and Open Air	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
b. Identify and apply concepts of 802.11 network authentication, association, service sets, roaming, and power management	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
c. Explain concepts of 802.11 Physical and Data Link Layer protocols	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
d. Recognize inherent radio-based network security vulnerabilities	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5

e. Identify alternate protocols and technologies designed to vastly improve wireless network security	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
f. Identify wireless LAN standards and the regulators and organizations responsible for their development and maintenance	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5

J. **APPLIED LEARNING COMPONENT:** Yes X No _____
 • Classroom/Lab

K. % **TEXTS:** Price, R. (2007). *Fundamentals of Wireless Networking*. Columbus, OH: McGraw-Hill Higher Education.

L. % **REFERENCES:** N/A

M. **EQUIPMENT:** Computer lab classroom with antennas, wireless access point, and cabling

N. % **GRADING METHOD:** A-F

O. % **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

- Exams
- Quizzes
- Projects

P. **DETAILED COURSE OUTLINE:**

I. Fundamentals of Network Technology

A. Network Models

B. History of Network Development

II. Introduction to Wireless Local Area Networks

A. The Wireless LAN Market

B. Wireless LAN Applications

III. Radio Frequency (RF) Fundamentals

- A. RF
- B. Principles of Antennas
- C. RF Mathematics

IV. Spread Spectrum Technology

- A. Introducing Spread Spectrum
- B. Frequency-Hopping Spread Spectrum (FHSS)
- C. Distributed Sequence Spread Spectrum (DSSS)
- D. Comparing FHSS and DSSS

V. Wireless LAN Infrastructure Devices

- A. Access Points
- B. Wireless Bridges
- C. Wireless Workgroup Bridges
- D. Wireless LAN Client Devices
- E. Wireless Residential Gateways
- F. Enterprise Wireless Gateways

VI. Antennas and Accessories

- A. RF Antennas
- B. Power-over-Ethernet (PoE) Devices
- C. Wireless LAN Accessories

VII. Wireless LAN Organizations and Standards

- A. FCC
- B. IEEE
- C. Major Organizations
- D. Competing Technologies

VIII. The 802.11 Network Architecture

- A. Locating a Wireless LAN
- B. Authentication and Association
- C. Service Sets
- D. Power Management Features

IX. Physical Layers

- A. How Wireless LANs Communicate
- B. Inter-frame Spacing
- C. Request to Send/ Clear to Send (RTS/CTS)
- D. Modulation

X. Troubleshooting Wireless LAN Installations

- A. Multi-path
- B. System Throughput

- C. Types of Interference
- D. Range Considerations

XI. Wireless LAN Security

- A. Wired Equivalent Privacy (WEP)
- B. Attacks on Wireless LANs
- C. Emerging Security Solutions
- D. Corporate Security Policy
- E. Security Recommendations

Q. LABORATORY OUTLINE: N/A