COURSE OUTLINE

CITA 260 INTRODUCTION TO WIRELESS TECHNOLOGY

Revised By: Minhua Wang
A. **TITLE:** Introduction to Wireless Technology

B. **COURSE NUMBER:** CITA 260

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** No

E. **COURSE LENGTH:** 15 weeks

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

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**
   3 lecture hours per week

H. **CATALOG 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.

I. **PRE-REQUISITES/CO-REQUISITES:**
   a. Pre-requisite(s): CITA 220 Data Communications and Network Technology
   b. Co-requisite(s): none

J. **GOALS (STUDENT LEARNING OUTCOMES):**
   By the end of this course, the student will be able to:

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<th>Course Objective</th>
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   | a. Define concepts of radio frequency communications as they apply to contemporary spread spectrum wireless networks including 802.11, 802.11a, 802.11b, Bluetooth, Home RF, and Open Air | 2. Crit. Thinking
   |                                                                                   | 3. Prof. Competence                |
   | b. Identify and apply concepts of 802.11 network authentication, association, service sets, roaming, and power management | 2. Crit. Thinking
   |                                                                                   | 3. Prof. Competence                |
   | c. Explain concepts of 802.11 Physical and Data Link Layer protocols              | 2. Crit. Thinking
   |                                                                                   | 3. Prof. Competence                |
   | d. Recognize inherent radio-based network security vulnerabilities               | 2. Crit. Thinking
   |                                                                                   | 3. Prof. Competence                |
   | e. Identify alternate protocols and technologies designed to vastly improve wireless network security | 2. Crit. Thinking
   |                                                                                   | 3. Prof. Competence                |
   | f. Identify wireless LAN standards and the regulators and organizations responsible for their development and maintenance | 2. Crit. Thinking
   |                                                                                   | 3. Prof. Competence                |
K. **TEXTS:**

L. **REFERENCES:** N/A

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

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

O. **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