# CPIT-475 Syllabus

## Catalog Description

**CPIT-475** Wireless Data Networks
**Credit:** 3 ( Theory: 3, Lab: 0, Practical: 1)
**Prerequisite:** CPIT-370
**Classification:** Elective

The objective of this course is to explore principles of IT Infrastructure, Networking and System Administration. Topics include cellular architecture, GSM, GPRS, UMTS, 802.11 WLAN infrastructure designing, and planning and administration.

**Class Schedule**

Meet 50 minutes 3 times/week or 80 minutes 2 times/week

Lab/Tutorial 90 minutes 1 times/week

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William Stallings, , "Wireless Communications and Networks", Prentice Hall; 2 edition (2005)

**ISBN-13** 9780131967908 **ISBN-10** 0131967908

## Grade Distribution

| Week | Assessment | Grade % |
|---|---|---|
| 2 | Graded Lab Work 1 | 2 |
| 3 | Quiz 1 | 5 |
| 4 | Graded Lab Work 2 | 2 |
| 6 | Exam 1 | 15 |
| 8 | Quiz 2 | 5 |
| 8 | Graded Lab Work 3 | 2 |
| 10 | Quiz 3 | 5 |
| 10 | Graded Lab Work 4 | 2 |
| 11 | Exam 2 | 15 |
| 11 | Graded Lab Work 5 | 2 |
| 15 | Lab Exam | 10 |
| 16 | Exam | 35 |

## Last Articulated

December 18, 2017

## Relationship to Student Outcomes

| a | b | c | d | e | f | g | h | i | j | k | l | m | n |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| x | | | | | | | | | | | | x | |

## Course Learning Outcomes (CLO)

By completion of the course the students should be able to

1. **Explain the time domain concepts and frequency domain concepts related to a periodic electromagnetic signal (a)**
2. Explain the relationship between capacity and bandwidth (a)
3. Analyze the physical challenges inherent in wireless communication channels. (m)
4. Differentiate among different propagation modes of an electromagnetic signal. (m)
5. **Distinguish various propagation antennas and describe their respective characteristics. (m)**
6. **Compare the basic characteristics of signal encoding techniques used in communications, such as FM, PM and PAM. (m)**
7. Discriminate the FHSS and DSSS (m)
8. Differentiate between various switching methods such as FDM, TDM. (m)
9. Compare methods of error detection and correction for wireless communication. (a)
10. Discover the characteristics of different satellite orbits (m)
11. Explain the different capacity allocation strategies for satellite communication (m)
12. **Describe the basic concepts for cellular networks including frequency reuse, cell shape, handover (a)**
13. Compare first generation and second generation architectures of cellular networks (m)
14. Describe IEEE 802.11 Wireless standard. (m)
15. **Explain the IEEE 802.11 Architecture with all details. (a)**
16. Describe Bluetooth techniques, application, standard and Architecture. (m)

## Coordinator(s)

Dr. Fatma Bouabdallah, Associate Professor

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## Topics Coverage Durations

| Topics | Weeks |
|---|---|
| Transmission Fundamentals | 2 |
| Antennas and Propagation | 2 |
| Signal Encoding Techniques | 1 |
| Spread Spectrum | 1 |
| Coding and Error Control | 1 |
| Satellite Communication | 1 |
| Cellular Network Architecture | 1 |
| Second Generation (GSM) Network/Third Generation (UMTS) Network | 1 |
| Wireless LAN | 1 |
| Wi-Fi and IEEE 802.11 Standard | 2 |
| Bluetooth and IEEE 802.15 Standard | 2 |