

1. Course Number and Name: 322 CNE – Wireless Communications Principles

2. Credits and Contact Hours: 3 Credit
a. Lecture – 2 day per week at 50 minutes for 16 weeks
b. Laboratory – 1 day per week at 100 minutes for 16 weeks

3. Course Coordinator or Instructor: Dept. of CNE

4. Text Book:

- Wireless Communications: Principles and Practice by Theodore S. Rappaport, Prentice Hall, 1996
- Wireless and Personal Communications Systems by Vijay K Garg and Joseph E Wilkes, Prentice Hall, 1996.

5. Specific Course Information:

a. Catalog Description: The course aims to equip the students with latest wireless technologies, security issues, internetworking in wireless systems, personal communication services, etc.

b. Prerequisites: 310 CNE Computer Networks

c. Status: Required

6. Specific Goals for the Course:

Course Outcomes:

- 1.Outline the fundamental technologies for wireless communications.
- 2.Define wireless propagation channel, path loss, shadowing, and fading.
- 3.Explain multiple access schemes: FDMA, TDMA, spread spectrum modulation, CDMA, and orthogonal frequency division multiple access.
- 4.Explain the theories and practice of diversity, multiple input multiple output (MIMO) system, space time coding, channel capacity and coding ISI, and equalization.
- 5.Design and evaluate digital modulation schemes to obtain optimum receivers for various wireless communication in fading channel.
- 6.Develop experimental skills of the students in the lab to be able to simulate and design wireless communication systems
- 7.Demonstrate the team-work of the students through small group assignments.
- 8.Show the ability to search the internet for new wireless techniques and simulation tools in order to perform the required analysis of wireless communications systems.

Map course LOs with the program LOs. (Place course LO #s in the left column and Student LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes											
	a1	a2	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
1	√											
2	√											
3			√									
4			√									
5				√								
6					√	240						
7								√				
8										√		

7. List of Topics: 322 CNE – Wireless Communications Principles

List of Topics for Theory:

- Introduction to wireless communication systems
- Path loss, statistical multi-path channel models, wideband and narrowband fading
- Digital modulation techniques for wireless communications and performance analysis
- Diversity
- Channel capacity and coding
- Adaptive modulation techniques
- Intersymbol interference and channel equalization
- Multiple access , Spread spectrum, CDMA, MIMO

List of Topics for Laboratory: