Department of Computer Engineering	
Special Topics in Networking (66554)	
Total Credits	**3**
major elective	
Prerequisites	P1 : Computer Networks I (66454)

Course Contents
The course covers the state-of-the-art on a set of topics in wireless networking from a practical/systems perspective.

Intended Learning Outcomes (ILO's)		**Student Outcomes (SO's)**	**Contribution**
1	The ability to understand and use the basic concepts of wireless networks (ex. Media access, topologies, functionality, protocols, coding)	C	50 %
2	The ability to apply the fundamentals and theories of wireless networks in new technologies (wimax, wlan, QoS, security) to implement and design WLAN	K	50 %

Textbook and/ or Refrences
Wireless Communications: Principles and Practice, by Theodore S. Rappaport, Prentice Hall. 802.11 Wireless Networks: The Definitive Guide, by Matthew Gast Mobile Communications, by Jochen Schiller, Addison-Wesley.

Assessment Criteria	**Percent (%)**
First Exam	20 %
Second Exam	20 %
Projects	10 %
Final Exam	50 %

Course Plan	
Week	**Topic**
1	Introduction to wireless networks RF basics Spread Spectrum Transmission and channels
2,3	Wireless network technologies and standards (IEEE802.11x) WPAN: Zigbee, Bluetooth, IR wireless sensors WLAN: Wifi technology and wireless devices Infra structure Ad-hoc WMAN: Wimax, Hot spots, Laser wireless network
4,5	Access media: PCF DCF structure (time-slot) Wireless functionalities and algorithms Carrier Sensing, interference, signal range Collision Avoidance and Congestion Control MAC management and frame format
6	Wireless LANs vs. Wired LANs Wireless limitations and problemsAnalyzing Wireless topologies WLAN and WMAN
7	First Exam
7,8	Wireless operation layers and a Architecture Mac layer (Queuing, operating,etc.) Physical layer: (power energy, signaling, antennas, etc.) Antennas and Propagation MIMO Radio
9,10	Designing and implementing WLAN 802.11- in the TCP/IP Operating channels Wireless routing DSDV DSR
11,12	Wireless security WEP Wired Equivalent Privacy Encryption Wi-Fi Protected Access WPA WLAN Security Measures
12	Second Exam

13,14	Wireless Qos IEEE802.11e EDCA Video and voice aver WLAN Critical data over WLAN
15,16	Mesh and Adhoc Networks in large scale Wireless networks evaluations Analyzing problems Network simulators
16	Final Exam