

EC551- Telecommunication System Engineering

CREDIT HOURS

3 Hours

CONTACT HOURS (Hours/week)

Lecture: 2; Tutorial: 2

COURSE COORDINATOR

Dr. Ashraf Mamdouh

TEXT BOOK

Martin Sauter, "Communication Systems for the Mobile Information Society"

COURSE DESCRIPTION

Principles, Technologies, system architectures, standards of GSM, GPRS, UMTS, WLAN, 802.16 and WiMAX - QoS in telecommunication systems - Internet Telephony - Resource allocation and management - Sensor networks

PREREQUISITE:

EC 422

RELATION OF COURSE TO PROGRAM

Elective

COURSE INSTRUCTION OUTCOMES

The student will be able to address the concept of system architecture level and target the layering model and management of telecommunication systems practically available in the world.

TOPICS COVERED

- GSM - The Signaling System Number 7 - The GSM Subsystems - The Network Subsystem - The Base Station Subsystem (BSS).
- GSM - Mobility Management and Call Control - The Mobile Station - The SIM card - The Intelligent Network Subsystem and CAMEL - Questions.
- GPRS - The GPRS Air Interface - The GPRS State Model - GPRS Network Elements - GPRS Radio Resource Management.
- GPRS - GPRS Interfaces – GPRS Services
- UMTS - CDMA - UMTS Channel Structure on the Air Interface - The UMTS Terrestrial Radio Access Network (UTRAN).
- Core Network Mobility Management - High Speed Downlink Packet Access (HSDPA) - UMTS Release 6: High Speed Uplink Packet Access (HSUPA).
- WLAN - The MAC Layer - The Physical Layer - Wireless LAN Security - Comparison of Wireless LAN and UMTS
- 802.16 and WiMAX

- Security - Advanced 802.16 Functionalities - Mobile WiMAX: 802.16e - WiMAX Network Infrastructure - Comparison of 802.16 with UMTS, HSDPA and WLAN
- QoS in telecommunication systems
- IP networking
- Multimedia networking - Internet Protocol Version 4 (IPv4) - Internet Protocol Version 6 (IPv6) - Multicast Support.
- Internet Telephony
- Resource allocation and management
- Sensor networks

CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:

Professional component Content			
Math and Basic Sciences	Engineering Topics	General Education	Other
	✓		

RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course aspects
A	An ability to apply knowledge of mathematics, science, and engineering	
B	An ability to design and conduct experiments, analyze and interpret data.	
C	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economics, environmental, social, political, ethical, health, and safety, manufacturability, and sustainability	c ₃
D	An ability to function on multi-disciplinary teams.	
E	An ability to identify, formulate, and solve engineering problems	e ₁ e ₂
F	An understanding of professional and ethical responsibility	f ₁ f ₂
G	An ability to communicate effectively	
H	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social content	h ₁
I	A recognition of the need for, and an ability to engage in life-long learning.	
J	A knowledge of contemporary issues within and outside the electrical engineering profession.	j ₂
k	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	