

Faculty of Engineering & Technology

Mobile Communication Systems

Information :

Course Code : COM 523

Level : Undergraduate

Course Hours : 3.00- Hours

Department : Specialization of Electronics & Communication

Instructor Information :

Title	Name	Office hours
Lecturer	MOHAMED MOUSA SAYED EMAM AHMED	2
Assistant Lecturer	Mostafa Mohamed Salaheldin Abdelkhalek	1

Area Of Study :

- Develop student knowledge about the fundamentals of mobile communication systems and their evolution.
- Prepare students to design mobile communication networks.
- Train students to evaluate the performance of mobile communication systems.

Description :

Conventional telephone systems, Traffic theory, Conventional mobile system, Frequency spectral efficiency, Methods of increasing system capacity, System, Architecture, Access schemes, Interference in cellular system, Hand off, propagation models, Fading and Doppler in cellular system, GSM system architecture, GSM channel coding, Ciphering and modulation, System management, CDMA spread spectrum systems, Direct sequence SSS, The performance of DS-SSS, CDMA air links: the forward pilot channel, sync channel, paging channel, traffic channel, Access channel, Types of codes used in CDMA, Power and Hand-off.

Course outcomes :

a. Knowledge and Understanding: :

- 1 - Explain the fundamentals of mobile communication systems and their terms.
- 2 - Interpret the principles of teletraffic theory and its application in mobile network design.
- 3 - Describe the principles and recent standards of mobile network design and analysis.

b. Intellectual Skills: :

- 1 - Design the performance of mobile radio networks.
- 2 - Apply teletraffic theory for modelling mobile radio networks.

c. Professional and Practical Skills: :

- 1 - Apply mathematical background to develop a mobile radio network.
- 2 - Use software tools to design the parameters of a mobile radio network and evaluate its performance

d. General and Transferable Skills: :

- 1 - Collaborate effectively within multidisciplinary team.

2 - Communicate effectively.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
The Cellular Concept and its Fundamentals	10	6	4
Interference and System Capacity	10	6	4
Trunking and Grade of Service	10	6	4
Improving Capacity in Cellular Systems	10	6	4
Large-Scale Path Loss	15	9	6
Small-Scale Fading and Multipath	10	6	4
Time Dispersion and Coherence Bandwidth	5	3	2
Recent mobile network standards: CDMA, LTE and an intro to 5G	10	6	4

Teaching And Learning Methodologies :

Interactive Lecturing
Problem Solving
Discussion
Experiential Learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignment	10.00		
Final exam	40.00		
Mid-Term exams	30.00		
Project	10.00		
Quizzes	10.00		

Recommended books :

A. Goldsmith, Wireless Communications, Cambridge University Press, 2005.