

COLLEGE OF ELECTRICAL AND MECHANICAL ENGINEERING
NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY

Title	:	Mobile Networks
Credits	:	3(2, 1)
Instructor	:	Mr. Mohammed Kaleem
Lab Instructor	:	Mr. AKhlaq Ahmed / Mr. Mohammed Kaleem
Course Code	:	EC-425

Goals : This course examines mobile networks. It covers fundamentals of mobile (Cellular) network architectures and some key factors driving the telecommunication industry. It briefly discusses the operation of wireless telecommunication systems like AMPS, GSM, MPLS, GPRS and 3G (UMTS) systems. Another focus of this course is on routing schemes for mobile and nomadic hosts, including mobile IP, mobile ad hoc network (MANET) protocols and IPv6. It also throws some light on QOS and Security issues of mobile networks. The material in the course is drawn from the research literature as well as from the course book. The unit emphasizes basic principles and topics of fundamental importance concerning the wireless communication systems and providing a detailed discussion of leading-edge technologies.

Text Book

- Wireless communications and Networks –By William Stallings 2nd Edition.

Reference Books

- Wireless communications by Theodore S.
- Wireless communications: Principles and practice by T. S. Rappaport.
- Cellular digital packet data by Muthuthamby S. Rajiv Kumar
- Data communications and Networking by Behrouz A. Forouzan

Week-Wise Breakdown of Topics

- Introduction to wireless communication, broadband and wireless comms. Cell, Cell-Site (2)
- Channel Capacity, Blocking, , Transmission media, Classification of Transmission media, Multiplexing, Transmission Impairments, WLAN, WMAN and PAN etc (2)
- Switching techniques, Bluetooth PANs, IEEE802.11, WATM, (2)
- Protocols and the TCP/IP suite, CSMA, CSMA/CA, MPLS (2)
- Antenna and Propagations, Principle of radio and micro wave, Line of Sight transmission, fading in the mobile environment. (2)

Class Test NO. 1

- Signal encoding techniques, Analogue and digital data and digital signals (2)
- Spread spectrum, Frequency hopping, Direct Sequence, CDMA, Error detection (2)
- Coding (BCH codes, Convolutional Codes, turbo codes etc) and Error control, Routing techniques in mobile networks (2)
- Wireless Networking, WAP, iMode, Mobile ad hoc networks(MANETs) (4)

Class Test NO.2

- Satellite Communications, Cellular wireless networks, FDMA, TDMA (4)
- Principles of Cellular networks, 3G, Cordless systems and WLL, (2)
- Wireless LAN, GSM, GPRS, Quality of Services(4)
- Mobile IP, Security issues in Mobile networks, Blue tooth, UMTS (4)

Final Examination

Tests/Exams

Class Test # 1	:	7 th week
Class Test # 2	:	14 th week
Final Exam	:	21 th Week

Marks Distributions

Class Test # 1	:	15%
Class Test # 2	:	15%
Final Exam	:	50%
Quizzes	:	10%
Research Work/Lab	:	10%

