COURSE TITLE : COMMUNICATION SYSTEMS
COURSE CODE : 6042
COURSE CATEGORY : A
PERIODS PER WEEK : 5
PERIODS PER SEMESTER : 75/6
CREDITS : 5

TIME SCHEDULE

MODULE	TOPIC	PERIODS
1	Microwave communication	19
2	Satellite communication	19
3	Optical fibre communication	18
4	Mobile communication	19
	TOTAL	**75**

Course General Outcome :

MODULE	GO	On completion of the study of this course the students will be able :
1	1	To understand the working of microwave devices
	2	To understand the function of microwave transmission system
2	3	To understand the satellite communication system
	4	To know the transmission devices in satellite communication system
3	5	To understand fibre optics communication system
	6	To understand the working of fibre optic devices
4	7	To understand mobile communication system
	8	To understand various mobile technologies

GO - General Outcome

On completion of the study of this course the students will be able :

MODULE I MICROWAVE COMMUNICATION

1.1.0 To understand the working of microwave devices

1.1.1 To explain the concept of microwave communication
1.1.2 To explain the working of reflex klystron, magnetron and TWT
1.1.3 To explain the working of gunn diode and tunnel diode
1.1.4 To describe the function of wave guides and horn antenna

1.2.0 To understand the function of microwave transmission system

1.2.1 To explain the function of microwave transmitter
1.2.2 To explain microwave repeater
1.2.3 To explain microwave receiver

MODULE II SATELLITE COMMUNICATION

2.1.0 To understand the satellite communication system

2.1.1 To explain the principle of satellite communication with block diagram
2.1.2 To explain FDMA, TDMA and CDMA
2.1.3 To compare FDMA, TDMA and CDMA
2.1.4 To write the advantages and disadvantages of FDMA, TDMA and CDMA
2.1.5 To describe communication satellite orbit
2.1.6 To describe geostationary satellite

2.2.0 To know the transmission devices in satellite communication system

2.2.1 To explain various equipments used in satellite earth station
2.2.2 To describe dish antenna
2.2.3 To list applications of satellite
2.2.4 To explain direct-to-home (DTH) satellite television
2.2.5 To describe direct broadcast services (DBS)
2.2.6 To describe GPS navigation system
2.2.7 To describe geographic information system (GIS)

MODULE III OPTICAL FIBRE COMMUNICATION

3.1.0 To understand fibre optics communication system

3.1.1 To explain the block diagram of fibre optic communication system
3.1.2 To list advantages of fibre optic communication
3.1.3 To explain acceptance angle and numerical aperture
3.1.4 To explain single mode, multimode and graded index fibres
3.1.5 To explain cable losses

3.2.0 To understand the working of fibre optic devices

3.2.1 To explain optical sources; LED and Lasers
3.2.2 To explain the working of PIN diode and avalanche diodes as optical receivers
3.2.3 To explain the application of fibre optics in data communication

MODULE IV MOBILE COMMUNICATION

4.1.0 To understand mobile communication system

4.1.1 To write the advantages and applications of mobile communication
4.1.2 To explain the concept of cell, frequency reuse
4.1.3 To explain the operation of cellular network
4.1.4 To explain handoff strategies and channel fading
4.1.5 To explain the GSM network architecture

4.2.0 To understand various mobile technologies

4.2.1 To describe the GSM standards
4.2.2 To explain CDMA technology
4.2.3 To compare GSM and CDMA
4.2.4 To describe RFID
4.2.5 To explain the concept of Wi-Fi
4.2.6 To explain Wi-Max
4.2.7 To list the features and applications of Wi-Max
4.2.8 To compare Wi-Fi and Wi-Max
4.2.9 To describe Bluetooth
4.2.10 To describe 3G and 4G mobile technologies

CONTENT DETAILS

MODULE I Microwave communication

Introduction to microwave communication - characteristics - frequency bands - transit time effect - microwave devices - reflex klystron - magnetron- TWT - gunn diode - tunnel diode - wave guides - types - horn antennas - microwave transmitter - microwave repeater - receiver

MODULE II Satellite communication

Satellite communication block diagram up-link and down-link transponder - modulation - FDMA, TDMA, CDMA - communication satellite orbits - concepts of geo stationary synchronous satellite - earth station - block diagram explanation of earth station - dish antenna - applications of satellite systems - direct-to-home (DTH) satellite television - direct broadcast services (DBS) - GPS navigation system - geographic information system (GIS)

MODULE III Optical fibre communication

Fiber optic system - block diagram, advantages - optical fibers - refraction, acceptance angle, numerical aperture - single mode vs multimode - grade index fiber, cable losses - optical sources - LED, LASERs - optical detectors - PIN diodes - avalanche diodes - application in data communication

MODULE IV Mobile communication

Mobile communication - advantages - applications - operation of cellular networks - concept of cell, frequency reuse - handoff strategies and channel fading - GSM network architecture - GSM standards - CDMA technology - RFID - concept of Wi-Fi - Wi-Max - features and applications Wi-Fi and Wi-Max comparison - bluetooth - principles of operation - 3G and 4G mobile technologies - comparison

Text Book

1. Microwave Devices & Circuits- Samuel Y. Liao – 3rd Edition - PHI
2. Optical Fiber Communication - John Senior - 3rd Edition - PHI
3. Wireless Communication - Theodore S. Rappaport – 2nd Edition - PHI
4. Mobile communication - Jochen Schiller – Pearson

Reference

1. Electronic communication systems - George Kennedy, Robert J Schoenbeck
2. Electronic communication - Roy Blake - 2nd Edition - Thomson and Delmar
3. Satellite Communication - Roddy
4. Satellite Communication - Timothy Pratt
5. Fiber-Optic Communication Systems- 3rd Edition – Govind P. Agrawal - Wiley
6. Mobile and personal communication systems and service - Raj Pandya