LESSON PLAN (SUMMER-2024)

Discipline: ETC	**Semester:6th**	**Name of the Teaching Faculty: Rajeev Ranjan Seth**
Subject: Advance Communication Engineering	**No of Days /perweek class allotted: 5**	**Semester From date: 16.01.2024 To date: 26.04.2024** **No of Weeks: 14**
Week	**Class Day**	**Theory / Practical Topics**
1st	1st	**1. RADAR & NAVIGATION AIDS (10)** 1.1 Basic Radar, advantages & applications
	2nd	1.2 Working principle of Simple Radar system , its types
	3rd	1.3 Radar range equation &Performance factor of radar.
	4th	1.4 Working principle of Pulsed Radar system.
	5th	1.5 Function of radar indication and Working principle of moving target indicator.
2nd	1st	1.6 Define Doppler effect & Working principle of C.W Radar.
	2nd	1.7 Radar aids to Navigation
	3rd	1.8 MTI Radar- working principle
	4th	1.9 Aircraft landing system.
	5th	1.10 Navigation Satellite System.(NAVSAT) & GPS System
3rd	1st	**2. SATELLITE COMMUNICATION (15)** 2.1 Basic Satellite Transponder & Kepler's Laws
	2nd	2.2 Satellite Orbital patterns and elevation(LEO,MEO & GEO) categories
	3rd	2.3 Concept of Geostationary Satellite, calculate its height, velocity & round trip time delay & their advantage & disadvantage
	4th	2.4 Working of the Satellite sub system
	5th	2.5 Satellite frequency allocation and frequency bands.
4th	1st	2.6 General structure of satellite Link system (Uplink, Down link, Transponder, Crosslink)
	2nd	2.7 Working principle of direct broadcast system (DBS)
	3rd	2.8 Working principle of VSAT system.
	4th	2.9 Define multiple accessing & name various types.
	5th	2.10 Time Division Multiple Accessing(TDMA) & – block diagram, its advantages & dis-advantages.
5th	1st	Code Division Multiple Accessing (CDMA) – block diagram, its advantages & dis-advantages.
	2nd	2.11 Satellite Application- Communication Satellite(MSAT),
	3rd	Digital Satellite Radio.
	4th	2.12 Working principle of GPS Receiver & Transmitter& applications.
	5th	2.13 Optical Satellite Link transmitter & Receiver
6th	1st	**3. OPTICAL FIBER COMMUNICATION (15)** 3.1 Basic principle of Optical communication. 3.2 Compare the advantage and disadvantage of optical fibres&metallic cables
	2nd	3.3 Electromagnetic Frequency and wave line spectrum
	3rd	3.4 Types of optical fibres&principles of propogation in a fibre using Ray Theory
	4th	3.5 Optical fiber construction
	5th	3.6 Define terms: Velocity of propagation, Critical angle, Acceptance angle numerical aperture
7th	1st	3.7 Optical fibre communication system- block diagram & working principle
	2nd	3.8 Modes of propagation and index profile of optical fiber
	3rd	3.9 Types optical fiber configuration: Single-mode step index, Multi-mode step index, Multi-mode Graded index
	4th	3.10 Attenuation in optical fibers – Absorption losses, scattering, losses, bending losses, core and cladding losses- Dispersion – material Dispersion, waveguide dispersion, Intermodal dispersion
	5th	3.11 Optical sources(Transmitter) & types – LED- semiconductor laser diodes

8th	1st	3.12 LASER -its working principles, block diagram using laser feedback control circuit
	2nd	3.13 Optical detectors – PIN and APD diodes &Block diagram using APDConnectors and splices –Optical cables - Couplers
	3rd	3.14 Optical repeater & Single Channel system
	4th	3.15 Applications of optical fibres – civil, Industry and Military application
	5th	3.16 Concept of Wave Length Division Multiplexing (WDM) principles.
9th	1st	**4. TELECOMMUNICATION SYSTEM (10)** 4.1 Working of Electronic Telephone System. (Telephone Set)
	2nd	4.2 Function of switching system.
	3rd	Call procedures
	4th	4.3 Space and time switching.
	5th	4.4 Numbering plan of telephone networks (National Schemes & International Numbering)
10th	1st	4.5 Working principle of a PBX & Digital EPABX.
	2nd	Working principle of Digital EPABX.
	3rd	4.6 Units of Power Measurement.
	4th	4.7 Working principle of Internet Protocol Telephone
	5th	4.8 Working principle of Internet Telephone
11th	1st	**5. DATA COMMUNICATION (10)** 5.1 Basic concept of Data Communication
	2nd	5.2 Architecture, Protocols and Standards
	3rd	5.3 Data Communication Circuits
	4th	5.4 Types of Transmission
	5th	Transmission Modes
12th	1st	5.5 Data Communication codes
	2nd	5.6 Basic idea of Error control
	3rd	Error Detection
	4th	5.7 MODEM & its basic block diagram
	5th	common features Voice Band Modem
13th	1st	**6. WIRELESS COMMUNICATION (15)** 6.1 Basic concept of Cell Phone, frequency reuse channel assignment strategic
	2nd	handoff co-channel Interference and system capacity of a Cellular Radio systems.
	3rd	6.2 Concept of improving coverage and capacity in cellular system (Cell Splitting, Sectoring)
	4th	6.3 Wireless Systems and its Standards.
	5th	6.4 Discuss the GSM (Global System for Mobile) service and features.
14th	1st	6.5 Architecture of GSM system &
	2nd	GSM mobile station &channel types of GSM system.
	3rd	6.6 working of forward and reveres CDMA channel,
	4th	the frequency and channel specifications
	5th	6.7 Architecture and features of GPRS.
15th (EXTRA)	1st	6.8 Discuss the mobile TCP, IP protocol.
	2nd	6.9 Working of Wireless Application Protocol (WAP).
	3rd	6.10 Features of SMS, MMS, 1G,2G,
	4th	3G, 4G& 5G Wireless network.
	5th	6.11 Smart Phone and discuss its features indicate through Block diagram.

Rajeev Ranjan Seth

Signature of the Faculty