

GOVERNMENT POLYTECHNIC, SAMBALPUR, RENGALI

DEPARTMENT OF E&TC ENGINEERING

LESSON PLAN(SUMMER-2023)

SUBJECT- ADVANCE COMMUNICATION ENGINEERING(TH-1)

SEMESTER-6TH

NAME OF THE FACULTY- SRI Saroj Kanta Ray

TOTAL NO. OF PERIODS-75(5/W)

UNIT	DATE	PERIOD	TOPICS TO BE COVERED
1	1st week of February, 2023		RADAR & NAVIGATION AIDS
		1	Basic Radar, advantages & applications
		2	Working principle of Simple Radar system, its types
		3	Radar range equation & Performance factor of radar.
		4	Working principle of Pulsed Radar system.
		5	Function of radar indication and Working principle of moving target indicator.
		6	Define Doppler effect & Working principle of C.W Radar.
		7	Radar aids to Navigation, MTI Radar- working principle
		8	Aircraft landing system.
		9	Navigation Satellite System.(NAVSAT) & GPS System
		10	Previous year questions, numericals & assignment discussion.
2	4 th week of February, 2023		SATELLITE COMMUNICATION
		1	Basic Satellite Transponder & Kepler's Laws
		2	Satellite Orbital patterns and elevation(LEO, MEO & GEO) categories
		3	Concept of Geostationary Satellite, calculate its height, velocity & round trip time delay & their advantage & disadvantage
		4	Working of the Satellite sub system
		5	Satellite frequency allocation and frequency bands
		6	General structure of satellite Link system (Uplink, Down link, Transponder, Crosslink)
		7	Working principle of direct broadcast system (DBS)
		8	Working principle of VSAT system.
		9	Define multiple accessing & name various types.
		10	Time Division Multiple Accessing(TDMA) & Code Division Multiple Accessing (CDMA) – block diagram, its advantages & dis-advantages.
		11	Satellite Application- Communication Satellite(MSAT), Digital Satellite Radio.
		12	Working principle of GPS Receiver & Transmitter & applications.
		13	Optical Satellite Link transmitter & Receiver
		14	Previous year questions, numericals & assignment discussion.
15			
			OPTICAL FIBER COMMUNICATION
		1	Basic principle of Optical communication.
		2	Compare the advantage and disadvantage of optical fibres & metallic cables

3	4 th week of March,2023	3	Electromagnetic Frequency and wave line spectrum		
		4	Types of optical fibres&principles of propogation in a fibre using Ray Theory		
		5	Optical fiber construction		
		6	Define terms: Velocity of propagation, Critical angle, Acceptance angle numericalaperture		
		7	Optical fibre communication system- block diagram & working principle		
		8	Modes of propagation and index profile of optical fiber, Types optical fiber configuration: Single-mode step index, Multi-mode step index, Multi-mode Graded index		
		9	Attenuation in optical fibers – Absorption losses, scattering, losses, bending losses, core and cladding losses- Dispersion – material Dispersion, waveguide dispersion, Intermodal dispersion		
		10	Optical sources(Transmitter) & types – LED-semiconductor laser diodes		
		11	LASER -its working principles, block diagram using laser feedback control circuit		
		12	Optical detectors – PIN and APD diodes &Block diagram using APD Connectors and splices –Optical cables – Couplers		
		13	Optical repeater & Single Channel system, Applications of optical fibres – civil, Industry and Military application		
		14	Concept of Wave Length Division Multiplexing (WDM) principles.		
		15	Previous year questions, numericals & assignment discussion		
		4	4 th week of April,2023		TELECOMMUNICATION SYSTEM
				1	Working of Electronic Telephone System. (Telephone Set)
2	Function of switching system.& Call procedures				
3	Space and time switching				
4	Numbering plan of telephone networks (National Schemes & International Numbering)				
5	Working principle of a PBX & Digital EPABX.				
6	Units of Power Measurement				
7	Working principle of Internet Protocol Telephone				
8	Working principle of Internet Telephone				
9	Previous year questions, numericals & assignment discussion				
10	Revision Test				
5	3rd week of May,2023		Data Communication		
		1	Basic concept of Data Communication		
		2	Architecture, Protocols and Standards		
		3	Data Communication Circuits		
		4	Types of Transmission & Transmission Modes		
		5	Data Communication codes		
		6	Basic idea of Error control & Error Detection		
		7	MODEM & its basic block diagram& common features		
		8	Voice Band Modem		
		9	Previous year questions, numericals & assignment discussion		
10	discussion				
			WIRELESS COMMUNICATION		

6	2nd week of June,2023	1	Basic concept of Cell Phone,frequency reuse channel assignment strategic handoff co-channel Interference and system capacity of a Cellular Radio systems.
		2	
		3	Concept of improving coverage and capacity in cellular system (Cell Splitting, Sectoring)
		4	Wireless Systems and its Standards.
		5	Discuss the GSM (Global System for Mobile) service and features.
		6	Architecture of GSM system & GSM mobile station &channel types of GSM system.
		7	
		8	working of forward and reverses CDMA channel,the frequency and channel specifications
		9	Architecture and features of GPRS.
		10	Discuss the mobile TCP, IP protocol.
		11	Working of Wireless Application Protocol (WAP).
		12	Features of SMS, MMS, 1G,2G, 3G, 4G& 5G Wireless network.
		13	Smart Phone and discuss its features indicate through Block diagram
		14	Previous year questions, numericals & assignment discussion
		15	Revision Test