UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

LESSON PLAN

SESSION: 2023-2024

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING

SUBJECT CODE: Th.1

NAME OF THE SUBJECT: ADVANCED COMMUNICATION ENGINEERING

BRANCH: ELECTRONICS & TELECOMMUNICATION

SEMESTER: DIPLOMA 6TH SEM

NUMBER OF CLASSES ALLOTTED PER WEEK: 5

TOTAL PERIODS ALLOTED TO THE SUBJECT ACCORDING TO SCTEVT:75

NAME OF THE FACULTY: MANINI MONALISA PRADHAN

UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

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PERIODS PER WEEK:	**5**
NAME OF THE FACULTY:	**MANINI MONALISA PRADHAN**
NO OF CLASSES ALLOTTED PER WEEK:	**5(16/01/2024 to 26/04/2024)**

Week	Lecture	Topic to be covered
1st week	1st	Basic Radar ,advantages and application
	2nd	Working principle of simple radar, its type
	3rd	Radar range equation and its performance factor
	4th	Working principle of Pulse radar
2nd week	1st	Function of radar indication and working principle of moving target indicator
	2nd	Define Doppler effect and working principle of CW radar
	3rd	RADAR aids to navigation
	4th	MTI radar
	5th	Aircraft landing system
3rd week	1st	Navigation Satellite System
	2nd	GPS System
	3rd	Basic satellite Transponder and kepler's law
	4th	Satellite orbital pattern
	5th	LEO,MEO, GEO

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Week	Lecture	Topic to be covered
4th week	1st	Concept of Geostationary Satellite, calculate its height, velocity, round trip time delay & their advantage & disadvantage
	2nd	Working of the Satellite sub system.
	3rd	Satellite frequency allocation and frequency band
	4th	General structure of satellite Link system (Uplink , Down link, Transponder, Crosslink)
	5th	Working principle of direct broadcast system (DBS)
5th week	1st	Working principle of VSAT system
	2nd	Define multiple accessing & name various types- Time Division Multiple Accessing (TDMA)
	3rd	Code Division Multiple Accessing (CDMA) – block diagram, its advantages & dis-advantages
	4th	Satellite Application- Communication Satellite(MSAT)
	5th	Digital Satellite Radio
6th week	1st	Working principle of GPS Receiver & Transmitter& applications
	2nd	Optical Satellite Link transmitter & Receiver
	3rd	Basic principle of Optical communication. Compare the advantage and disadvantage of optical fibers & metallic cables
	4th	Electromagnetic Frequency and wave line spectrum
	5th	Types of optical fibers & principles of propagation in a fiber using Ray Theory

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7th week	1st	Optical fiber construction
	2nd	Define terms: Velocity of propagation, Critical angle, Acceptance angle numerical aperture
	3rd	Optical fiber communication system- block diagram & working principle
	4th	Modes of propagation and index profile of optical fiber
	5th	Types optical fiber configuration: Single-mode step index, Multi-mode step index, Multi-mode Graded index
8th week	1st	Attenuation in optical fibers – Absorption losses, scattering, losses, bending losses, core and cladding losses- Dispersion – material Dispersion, waveguide dispersion, Intermodal dispersion
	2nd	Optical sources(Transmitter) & types – LED- semiconductor laser diodes
	3rd	LASER -its working principles, block diagram using laser feedback control circuit
	4th	Optical detectors – PIN and APD diodes & Block diagram using APD Connectors and splices –Optical cables - Couplers
	5th	Optical repeater & Single Channel system
9th week	1st	Applications of optical fibers – civil, Industry and Military application
	2nd	Concept of WaveLength Division Multiplexing (WDM) principles
	3rd	Working of Electronic Telephone System.
	4th	Function of switching system.& Call procedures
	5th	Space switching

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10th week	1st	Time switching
	2nd	Numbering plan of telephone networks
	3rd	Working principle of a PBX
	4th	Working principle of a Digital EPABX.
	5th	Units of Power Measurement
11th week	1st	Working principle of Internet Protocol Telephone
	2nd	Working principle of Internet Telephone
	3rd	Basic concept of Data Communication
	4th	Architecture, Protocols and Standards
	5th	Data Communication Circuits
12th week	1st	Types of Transmission
	2nd	Transmission Modes
	3rd	Data Communication codes
	4th	Basic idea of Error control
	5th	Error Detection
13th week	1st	MODEM & its basic block diagram
	2nd	Common features Voice Band Modem
	3rd	Basic concept of Cell Phone
	4th	frequency reuse channel assignment strategic handoff co-channel Interference
	5th	system capacity of a Cellular Radio system
14th week	1st	Concept of improving coverage and capacity in cellular system
	2nd	Wireless Systems and its Standards
	3rd	Discuss the GSM (Global System for Mobile) service and features.
	4th	Architecture of GSM system
	5th	GSM mobile station & channel types of GSM system.

15th Week	1st	working of forward and reverse CDMA channel, the frequency and channel specifications
	2nd	Architecture and features of GPRS
		Discuss the mobile TCP, IP protocol.
		Working of Wireless Application Protocol (WAP).
		Features of SMS, MMS, 1G , 2G, 3G, 4G& 5G Wireless network. Smartphone and discuss its features indicated through Block diagram.