UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

LESSON PLAN

SESSION: 2022-2023

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

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NO OF CLASSES ALLOTTED PER WEEK: 5(14/02/2023 to 23/05/2023)

Week/Date	Lecture	Topic to be covered	Remarks
1st week 14/02/2023 To 18/02/2023	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 20/02/2023 To 25/02/2023	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 27/02/2023 To 04/03/2023	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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4th week 06/03/2023 To 11/03/2023	1st	Concept of Geostationary Satellite, calculate its height, velocity, Roundtrip time delay & their advantage & disadvantage	07/03/2023 TO 08/03/2023(Holi holidays)Need three extra classes for adjustment
	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 13/03/2023 To 18/03/2023	1st	Working principle of VSAT system	13/03/2023 TO 16/03/2023 (classes suspended due to semester exam).Need four extra classes
	2nd	Define multiple accessing & name various types- Time Division Multiple Accessing(TDMA)	
	3rd	Code Division MultipleAccessing (CDMA) – block diagram, its advantages & dis-advantages	
	4th	Satellite Application- Communication Satellite(MSAT)	
	5th	Digital SatelliteRadio	
6th week 20/03/2023 To 25/03/2023	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 & metalliccables	
	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 27/03/2023 To 01/04/2023	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 03/04/2023 To	1st	Attenuation in optical fibers — Absorption losses, scattering, losses, bending losses, core and cladding	07/04/2023(holiday) Need one extra class

08/04/2023		losses- Dispersion — material Dispersion, waveguide dispersion, Intermodal dispersion	for adjustment
	2nd	Optical sources(Transmitter) & types – LED- semiconductor laser diodes	
	3rd	LASER -its working principles, block diagram using laser feedbackcontrol circuit	
	4th	Optical detectors — PIN and APD diodes &Block diagram usingAPD Connectors and splices –Optical cables - Couplers	
	5th	Optical repeater & Single Channel system	
9th week 10/04/2023 To 15/04/2023	1st	Applications of optical fibers – civil, Industry and Military application	14/04/2023(holiday) Need one extra class for adjustment
	2nd	Concept of Wave Length 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 17/04/2023 To 22/04/2023	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 24/04/2023 To 29/04/2023	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 01/05/2023 To 06/05//2023	1st	Types of Transmission	05/05/2023(holiday)Need one extra class for adjustment
	2nd	Transmission Modes	
	3rd	Data Communication codes	
	4th	Basic idea of Error control	
	5th	Error Detection	
13th week 08/05/2023 To 13/05//2023	1st	MODEM & its basic block diagram	
	2nd	Common features Voice BandModem	
	3rd	Basic concept of Cell Phone	
	4th	frequency reuse channel assignment strategichandoff co-channel Interference	
	5th	system capacity of a Cellular Radio system	
14th week 15/05/2023 TO 20/05/2023	1st	Concept of improving coverage and capacity in cellular system	19/05/2023(holiday)Need one extra class for adjustment
	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 22/05/2023 TO 23/05/2023	1st	working of forward and reveres CDMA channel, the frequency and channel specifications	Classes will be continued up to 23/05/2023 as per academic calendar.this is 75 lecture so need three extra classes
	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. Smart Phone and discuss its features indicate through Block diagram.	