

UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA



LESSON PLAN

SESSION: 2025-2026

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 ALLOTTED TO THE SUBJECT ACCORDING TO
SCTEVT: **75**

NAME OF THE FACULTY: **ASHIS KUMAR MAHARANA**

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PERIODS PER WEEK:	5	
NAME OF THE FACULTY:	ASHIS KUMAR MAHARANA	
NO OF CLASSES ALLOTTED PER WEEK:	5 (22/12/2025 to 18/04/2026)	
Week	Lecture	Topic to be covered
1 st week	1 st	Basic Radar ,advantages and application
	2 nd	Working principle of simple radar, its type
	3 rd	Radar range equation and its performance factor
	4 th	Working principle of Pulse radar
2 nd week	1 st	Function of radar indication and working principle of moving target indicator
	2 nd	Define Doppler effect and working principle of CW radar
	3 rd	RADAR aids to navigation
	4 th	MTI radar
	5 th	Aircraft landing system
3 rd week	1 st	Navigation Satellite System
	2 nd	GPS System
	3 rd	Basic satellite Transponder and kepler's law
	4 th	Satellite orbital pattern
	5 th	LEO,MEO, GEO

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

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

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

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<u>Week</u>	<u>Lecture</u>	<u>Topic to be covered</u>
15 th week	1 st	working of forward and reverse CDMA channel, the frequency and channel specifications
	2 nd	Architecture and features of GPRS
	3 rd	Discuss the mobile TCP, IP protocol.
	4 th	Working of Wireless Application Protocol (WAP).
	5 th	Features of SMS, MMS, 1G , 2G, 3G, 4G& 5G Wireless network. Smartphone and discuss its features indicated through Block diagram.
<u>Week</u>	<u>Lecture</u>	<u>Topic to be covered</u>
16 th week	1 st	Review of UNIT - 1
	2 nd	Review of UNIT - 2
	3 rd	Review of UNIT - 3
	4 th	Review of UNIT - 3
	5 th	Review of UNIT - 4
<u>Week</u>	<u>Lecture</u>	<u>Topic to be covered</u>
17 th week	1 st	Review of UNIT - 5
	2 nd	Review of UNIT - 6
	3 rd	Review of UNIT - 6
	4 th	VST
	5 th	VST