GANDHI SCHOOL OF ENGINEERING

BHABANDHA, BERHAMPUR

BRANCH:- ELECTRONICS & TELECOMMUNICATION ENGINEERING

SEMESTER:- 5TH

SUBJECT:- WAVE PROPAGATION & BROADBAND COMMUNICATION ENGINEERING

Name of the Faculty- Er. Santosh Kumar Sahu

	Topic to be taken				Actual topic taken			
Sl. No	Topic/Module	No. of period	Details of the topics	Date	Topic No.	Topic Name	Date	Remarks
1	WAVE PROPAGATION & ANTENNA	12	1.1 Effects of environments such as reflection, refraction, interference, diffraction, absorption and attenuation (Definition only) 1.2 Classification based on Modes of Propagation-Ground wave, Ionosphere ,Sky wave propagation, Space wave propagation 1.3 Definition – critical frequency, max. useable frequency, skip distance, fading, Duct propagation & Troposphere scatter propagation actual height and virtual height 1.4 Radiation mechanism of an antenna-Maxwell equation. 1.5 Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern 1.6 Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna 1.7 Operation of following antenna with advantage & applications. a) Directional high frequency antenna : , Yagi & Rohmbus only b) UHF &Microwave antenna.: Dish antenna (with parabolic reflector) & Horn antenna 1.8 Basic Concepts of Smart Antennas-	08/08/2023 TO 22/08/2023	1.1 1.2 1.3 1.4	Effects of environments such as reflection, refraction, interference, diffraction, absorption and attenuation (Definition only) Classification based on Modes of Propagation-Ground wave, Ionosphere ,Sky wave propagation, Space wave propagation Definition – critical frequency, max. useable frequency, skip distance, fading, Duct propagation & Troposphere scatter propagation actual height and virtual height Radiation mechanism of an antenna-Maxwell equation.	08/08/2023 09/08/2023 & 10/08/2023 11/08/2023 12/08/2023	

			Concept and benefits of smart antennas		1.5	Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern	14/08/2023 & 16/08/2023	
					1.6	Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna	17/08/2023	
					1.7	Operation of following antenna with advantage & applications. a) Directional high frequency antenna : , Yagi & Rohmbus only b) UHF &Microwave antenna.: Dish antenna (with parabolic reflector) & Horn antenna	18/08/2023 & 19/08/2023 & 21/08/2023	
					1.8	Basic Concepts of Smart Antennas- Concept and benefits of smart antennas	22/08/2023	
2	TRANSMISSION LINES	10	2.1 Fundamentals of transmission line. 2.2 Equivalent circuit of transmission line & RF equivalent circuit 2.3 Characteristics impedance, methods of calculations & simple numerical. 2.4 Losses in transmission line. 2.5 Standing wave – SWR, VSWR, Reflection coefficient, simple numerical. 2.6 Quarter wave & half wavelength line 2.7 Impedance matching & Stubs – single & double 2.8 Primary & secondary constant of X-mission line.	23/08/2023 TO 07/09/2023	2.1	Fundamentals of transmission line.	23/08/2023	
					2.2	Equivalent circuit of transmission line & RF equivalent circuit	24/08/2023	
					2.3	Characteristics impedance, methods of calculations & simple numerical.	25/08/2023 & 26/08/2023	
					2.4	Losses in transmission line.	28/08/2023	
					2.5	Standing wave – SWR, VSWR, Reflection coefficient, simple numerical.	29/08/2023 & 31/08/2023	
					2.6	Quarter wave & half wavelength line	01/09/2023	

					2.7	Impedance matching & Stubs – single & double	04/09/2023	
					2.8	Primary & secondary constant of X-mission line.	07/09/2023	
3	TELEVISION ENGINEERING	13	3.1 Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses 3.2 TV Transmitter – Block diagram & function of each block. 3.3 Monochrome TV Receiver -Block diagram & function of each block. 3.4 Colour TV signals (Luminance Signal & Chrominance Signal,(I & Q,U & V Signals). 3.5 Types of Televisions by Technology-cathode-ray tube TVs, Plasma Display Panels, Digital Light Processing (DLP),Liquid Crystal Display (LCD),Organic Light-Emitting Diode (OLED) Display, Quantum Light-Emitting Diode (QLED) – only Comparison based on application 3.6 Discuss the principle of operation - LCD display, Large Screen Display. 3.7 CATV systems & Types & networks 3.8 Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & Digital TV receiver Video programme processor unit.	11/09/2023 TO 29/09/2023	3.1	Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses	11/09/2023 & 12/09/2023	
					3.2	TV Transmitter – Block diagram & function of each block.	13/09/2023 & 14/09/2023	
					3.3	Monochrome TV Receiver -Block diagram & function of each block.	15/09/2023 & 16/09/2023	
					3.4	Colour TV signals (Luminance Signal & Chrominance Signal,(I & Q,U & V Signals).	21/09/2023 & 22/09/2023	
					3.5	Types of Televisions by Technology- cathode-ray tube TVs, Plasma Display Panels, Digital Light Processing (DLP),Liquid Crystal Display (LCD),Organic Light-Emitting Diode (OLED) Display, Quantum Light-Emitting Diode (QLED) – only Comparison based on application	23/09/2023 & 25/09/2023	
					3.6	Discuss the principle of operation - LCD display, Large Screen Display.	26/09/2023	
					3.7	CATV systems & Types & networks	27/09/2023	

					3.8	Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & Digital TV receiver Video programme processor unit.	29/09/2023	
4	MICROWAVE ENGINEERING	15	4.1 Define Microwave Wave Guides. 4.2 Operation of rectangular wave gives and its advantage. 4.3 Propagation of EM wave through wave guide with TE & TM modes. 4.4 Circular wave guide. 4.5 Operational Cavity resonator. 4.6 Working of Directional coupler, Isolators & Circulator. 4.7 Microwave tubes-Principle of operational of two Cavity Klystron. 4.8 Principle of Operations of Travelling Wave Tubes 4.9 Principle of Operations of Cyclotron 4.10 Principle of Operations of Tunnel Diode & Gunn diode	30/09/2023 TO 18/10/2023	4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9 4.10	Define Microwave Wave Guides. Operation of rectangular wave gives and its advantage. Propagation of EM wave through wave guide with TE & TM modes. Circular wave guide. Operational Cavity resonator. Working of Directional coupler, Isolators & Circulator. Microwave tubes - Principle of operation of two Cavity Klystron. Principle of Operations of Travelling Wave Tubes Principle of Operations of Cyclotron Principle of Operations of Tunnel Diode & Gunn diode	30/09/2023 31/09/2023 03/10/2023 & 04/10/2023 06/10/2023 & 07/10/2023 09/10/2023 10/10/2023 & 11/10/2023 12/10/2023 & 13/10/2023 14/10/2023 & 16/10/2023 17/10/2023 18/10/2023	
5	BROADBAND COMMUNICATION	10	5.1 Broadband communication system-Fundamental of Components and Network architecture	31/10/2023 TO 10/11/2023	5.1	Broadband communication system-Fundamental of Components and Network	31/10/2023 & 01/11/2023	

			5.2 Cable broadband data network-architecture, importance & future of broadband telecommunication internet based network. 5.3 SONET(Synchronous Optical Network)-Signal frame components topologies advantages applications, and disadvantages 5.4 ISDN - ISDN Devices interfaces, services, Architecture, applications, 5.5 BISDN -interfaces & Terminals, protocol architecture applications			architecture 5.2 Cable broadband data network-architecture, importance & future of broadband telecommunication internet based network. 5.3 SONET(Synchronous Optical Network)-Signal frame components topologies advantages applications, and disadvantages 5.4 ISDN - ISDN Devices interfaces, services, Architecture, applications 5.5 BISDN -interfaces & Terminals, protocol architecture applications	02/11/2023 & 03/11/2023 04/11/2023 & 06/11/2023 07/11/2023 & 08/11/2023 09/11/2023 & 10/11/2023	

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