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-	**15/09/2022 TO 17/10/2022**	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.	**15/09/2022** **16/09/2022 & 19/09/2022** **20/09/2022** **22/09/2022**	

			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	**23/09/2022 & 26/09/2022**	
					1.6	Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna	**29/09/2022**	
					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	**30/09/2022 & 13/10/2022 & 14/10/2022**	
					1.8	Basic Concepts of Smart Antennas- Concept and benefits of smart antennas	**17/10/2022**	
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.	**18/10/2022 TO 10/11/2022**	2.1	Fundamentals of transmission line.	**18/10/2022**	
					2.2	Equivalent circuit of transmission line & RF equivalent circuit	**18/10/2022**	
					2.3	Characteristics impedance, methods of calculations & simple numerical.	**20/10/2022 & 21/10/2022**	
					2.4	Losses in transmission line.	**27/10/2022**	
					2.5	Standing wave – SWR, VSWR, Reflection coefficient, simple numerical.	**28/10/2022 & 01/11/2022**	
					2.6	Quarter wave & half wavelength line	**03/11/2022**	

					2.7	Impedance matching & Stubs – single & double	**04/11/2022**	
					2.8	Primary & secondary constant of X-mission line.	**09/11/2022 & 10/11/2022**	
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.	**11/11/2022 TO 06/12/2022**	3.1	Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses	**11/11/2022 & 14/11/2022**	
					3.2	TV Transmitter – Block diagram & function of each block.	**15/11/2022 & 17/11/2022**	
					3.3	Monochrome TV Receiver -Block diagram & function of each block.	**21/11/2022 & 22/11/2022**	
					3.4	Colour TV signals (Luminance Signal & Chrominance Signal,(I & Q,U & V Signals).	**24/11/2022 & 25/11/2022**	
					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**	**28/11/2022 & 29/11/2022**	
					3.6	Discuss the principle of operation - LCD display, Large Screen Display.	**02/12/2022**	
					3.7	CATV systems & Types & networks	**05/12/2022**	

					3.8	Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & Digital TV receiver Video programme processor unit.	**06/12/2022**	
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	**09/12/2022 TO 03/01/2023**	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	**09/12/2022** **09/12/2022** **12/12/2022 & 13/12/2022** **15/12/2022 & 16/12/2022** **19/12/2022** **20/12/2022 & 22/12/2022** **23/12/2022 & 26/12/2022** **27/12/2022 & 29/12/2022** **30/12/2022 & 02/01/2023** **03/01/2023**	
5	BROADBAND COMMUNICATION	**10**	5.1 Broadband communication system-Fundamental of Components and Network architecture	**05/01/2023 TO 20/01/2023**	5.1	Broadband communication system-Fundamental of Components and Network	**05/01/2023 & 06/01/2023**	

			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	**09/01/2023 & 10/01/2023** **12/01/2023 & 13/01/2023** **16/01/2023 & 17/01/2023** **19/01/2023 & 20/01/2023**	

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