

**GOVERNMENT POLYTECHNIC, SAMBALPUR, RENGALI**

**DEPARTMENT OF E&TC ENGINEERING**

**LESSON PLAN(WINTER-2021)**

**SUBJECT- WP & BC(TH-4)**

**SEMESTER-5<sup>TH</sup>**

**NAME OF THE FACULTY- Ms. Sadhana Subhalaxmi**

**TOTAL NO. OF PERIODS-60(4/W)**

<b>UNIT</b>	<b>DATE</b>	<b>PERIOD</b>	<b>TOPICS TO BE COVERED</b>
<b>1</b>	1 <sup>st</sup> week of November,2021		<b>WAVE PROPAGATION &amp; ANTENNA</b>
		1	Effects of environments such as reflection, refraction, interference, diffraction, absorption and attenuation (Definition only)
		2	Classification based on Modes of Propagation- Ground wave, Ionosphere, Sky wave propagation, Space wave propagation
		3	Definition – critical frequency, max. useable frequency, skip distance, fading, duct propagation & Troposphere scatter propagation actual height and virtual height
		4	Radiation mechanism of an antenna-Maxwell equation.
		5	Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern
		6	Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna
		7	Operation of following antenna with advantage & applications: 1- Directional high frequency antenna : , Yagi & Rohmbus only
		8	Operation of following antenna with advantage & applications: Dish antenna (with parabolic reflector)
		9	Operation of following antenna with advantage & applications: Horn antenna
		10	Basic Concepts of Smart Antennas- Concept and benefits of smart antennas
		11	Previous year questions discussion
12	Numerical problems and assignments		
			<b>TRANSMISSION LINES</b>
		1	Fundamentals of transmission line.
		2	Equivalent circuit of transmission line & RF equivalent circuit

2	1 <sup>st</sup> week of December,2021	3	Characteristics impedance, methods of calculations & simple numerical.
		4	Losses in transmission line.
		5	Standing wave – SWR, VSWR, Reflection coefficient, simple numerical.
		6	Quarter wave & half wavelength line
		7	Impedance matching & Stubs – single & double
		8	Primary & secondary constant of X-mission line.
		9	Previous year questions discussion
		10	Numerical problems and assignments
3	4 <sup>th</sup> week of December,2021		<b>TELEVISION ENGINEERING.</b>
		1	Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses
		2	TV Transmitter – Block diagram & function of each block.
		3	TV Transmitter – Block diagram & function of each block.
		4	Monochrome TV Receiver -Block diagram & function of each block.
		5	Monochrome TV Receiver -Block diagram & function of each block.
		6	Colour TV signals (Luminance Signal & Chrominance Signal,( I & Q,U & V Signals).
		7	Types of Televisions by Technology- cathode-ray tube TVs, Plasma Display Panels, Digital Light Processing (DLP) – only Comparison based on application
		8	Types of Televisions by Technology- Liquid Crystal Display (LCD), Organic Light-Emitting Diode (OLED) Display, Quantum Light-Emitting Diode (QLED) – only Comparison based on application
		9	Discuss the principle of operation - LCD display, Large Screen Display.
		10	CATV systems & Types & networks
		11	Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & Digital TV receiver Video programme processor unit.
		12	Previous year questions discussion
13	Numerical problems and assignments		
			<b>MICROWAVE ENGINEERING.</b>
		1	Define Microwave Wave Guides.
		2	Operation of rectangular wave gives and its advantage.

4	2 <sup>nd</sup> week of January,2022	3	Propagation of EM wave through wave guide with TE modes.		
		4	Propagation of EM wave through wave guide with TM modes.		
		5	Circular wave guide.		
		6	Operational Cavity resonator.		
		7	Working of Directional coupler.		
		8	Working of Isolators.		
		9	Working of Circulator.		
		10	Microwave tubes-Principle of operational of two Cavity Klystron.		
		11	Principle of Operations of Travelling Wave Tubes		
		12	Principle of Operations of Cyclotron		
		13	Principle of Operations of Tunnel Diode & Gunn diode		
		14	Previous year questions discussion		
		15	Numerical problems and assignments		
		5	2 <sup>nd</sup> week of February,2022		<b>Broadband communication</b>
				1	Broadband communication system-Fundamental of Components and Network architecture
2	Cable broadband data network- architecture, importance				
3	Future of broadband telecommunication internet based network.				
4	SONET(Synchronous Optical Network)-Signal frame components topologies advantages applications, and disadvantages				
5	SONET(Synchronous Optical Network)-Signal frame components topologies advantages applications, and disadvantages				
6	ISDN - ISDN Devices interfaces, services, Architecture, applications,				
7	BISDN -interfaces & Terminals, protocol architecture applications				
8	BISDN -interfaces & Terminals, protocol architecture applications				
9	Previous year questions discussion				
10	Numerical problems and assignments				