LESSON PLAN (WINTER-2024)		
Discipline: ETC	**Semester: 5th**	**Name of the Teaching Faculty: RAJEEV RANJAN SETH**
Subject: WAVE PROPAGATION & BROADBAND COMMUNICATION ENGINEERING	**No of Days /per week class allotted: 4**	**Semester From date: 01.07.2024 To date: 08.11.2024** **No of Weeks:19**
Week	**Class Day**	**Theory / Practical Topics**
1st	1st	**Unit-1: WAVE PROPAGATION & ANTENNA (12)** 1.1 Effects of environments such as reflection, refraction, interference, diffraction, absorption and attenuation (Definition only)
	2nd	1.2 Classification based on Modes of Propagation-Ground wave, Ionosphere , Sky wave propagation, Space wave propagation
	3rd	1.3 Definition – critical frequency, max. useable frequency, skip distance, fading, Duct propagation & Troposphere scatter propagation actual height and virtual height
	4th	Continue
2nd	1st	1.4 Radiation mechanism of an antenna-Maxwell equation.
	2nd	1.5 Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern
	3rd	Continue
	4th	1.6 Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna
3rd	1st	Continue
	2nd	1.7 Operation of following antenna with advantage & applications. a) Directional high frequency antenna : , Yagi & Rohmbus only
	3rd	b) UHF &Microwave antenna.: Dish antenna (with parabolic reflector) & Horn antenna
	4th	1.8 Basic Concepts of Smart Antennas- Concept and benefits of smart antennas
4th	1st	**Unit-2: TRANSMISSION LINES(10)** 2.1 Fundamentals of transmission line.
	2nd	2.2 Equivalent circuit of transmission line & RF equivalent circuit
	3rd	2.3 Characteristics impedance, methods of calculations & simple numerical.
	4th	Continue
5th	1st	2.4 Losses in transmission line.
	2nd	2.5 Standing wave – SWR, VSWR,
	3rd	Reflection coefficient, simple numerical.
	4th	2.6 Quarter wave & half wavelength line
6th	1st	2.7 Impedance matching & Stubs – single & double
	2nd	2.8 Primary & secondary constant of X-mission line.
	3rd	**Unit-3: TELEVISION ENGINEERING(13)** 3.1 Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses
	4th	Continue

7th	1st	3.2 TV Transmitter – Block diagram & function of each block.
	2nd	3.3 Monochrome TV Receiver -Block diagram & function of each block.
	3rd	3.4 Colour TV signals (Luminance Signal & Chrominance Signal,(I & Q,U & V Signals).
	4th	3.5 Types of Televisions by Technology- cathode-ray tube TVs, Plasma Display Panels,
8th	1st	Digital Light Processing (DLP), Liquid Crystal Display (LCD)
	2nd	Organic Light-Emitting Diode (OLED) Display, Quantum Light-Emitting Diode (QLED) – only Comparison based on application
	3rd	3.6 Discuss the principle of operation - LCD display,
	4th	Large Screen Display.
9th	1st	3.7 CATV systems & Types & networks
	2nd	3.8 Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & Digital TV receiver Video programme processor unit.
	3rd	Continue
	4th	4.1 Define Microwave Wave Guides.
10th	1st	4.2 Operation of rectangular wave gives and its advantage.
	2nd	4.3 Propagation of EM wave through wave guide with TE & TM modes.
	3rd	Continue
	4th	4.4 Circular wave guide.
11th	1st	4.5 Operational Cavity resonator.
	2nd	4.6 Working of Directional coupler, Isolators & Circulator.
	3rd	4.7 Microwave tubes-Principle of operational of two Cavity Klystron.
	4th	Continue
12th	1st	4.8 Principle of Operations of Travelling Wave Tubes
	2nd	Continue
	3rd	4.9 Principle of Operations of Cyclotron
	4th	4.10 Principle of Operations of Tunnel Diode & Gunn diode
13th	1st	**Unit-5: Broadband communication (10)** 5.1 Broadband communication system-Fundamental of Components and
	2nd	Continue
	3rd	Network architecture
	4th	Continue
14 th	1st	5.2 Cable broadband data network- architecture
	2nd	Continue
	3rd	importance &future of broadband telecommunication internet based network.
	4th	Continue
15^{th}		PUJA HOLIDAY
16th	1st	5.3 SONET(Synchronous Optical Network)-Signal frame components topologies
	2nd	Continue
	3rd	advantages applications, and disadvantages
	4th	Continue
17th	1st	5.4 ISDN - ISDN Devices interfaces,
	2nd	ISDN Devices services
	3rd	ISDN Devices Architecture

	4th	ISDN Devices applications
18th	1st	5.5 BISDN -interfaces & Terminals
	2nd	BISDN protocol
	3rd	BISDN architecture
	4th	BISDN applications
19th	1st	Revision
19th	2nd	Revision
19th	3rd	Revision
19th	4th	Revision

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