



NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)



LESSON PLAN

SUBJECT:Th.4 (Wave Propagation &Broadband Communication Engineering)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	WAVE PROPAGATION & ANTENNA	12	12
2	TRANSMISSION LINES	10	10
3	TELEVISION ENGINEERING	13	13
4	MICROWAVE ENGINEERING	15	15
5	BROADBAND COMMUNICATION	10	10
	TOTAL	60	60

LESSON PLAN

Discipline: ELECTRICAL AND ELECTRONIC ENGINEERING	Semester: 5th	Name of the Teaching Faculty: Er.Niranjan Sahu
Week	Class Day	Theory / Practical Topics
1st	1st	Unit-1: WAVE PROPAGATION & ANTENNA 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	1.2 Classification based on Modes of Propagation-Ground wave, Ionosphere, Sky wave propagation, Space wave propagation
	4th	1.3 Definition – critical frequency, max. useable frequency, skip distance, fading, Duct propagation & Troposphere scatter propagation actual height and virtual height
2nd	1st	1.3 Definition – critical frequency, max. useable frequency, skip distance, fading, Duct propagation & Troposphere scatter propagation actual height and virtual height
	2nd	1.4 Radiation mechanism of an antenna-Maxwell equation.
	3rd	1.5 Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern
	4th	1.5 Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern

3 rd	1 st	1.6 Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna
	2 nd	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
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	4 th	1.8 Basic Concepts of Smart Antennas- Concept and benefits of smart antennas
4 th	1 st	Unit-2: TRANSMISSION LINES. 2.1 Fundamentals of transmission line.
	2 nd	2.2 Equivalent circuit of transmission line & RF equivalent circuit
	3 rd	2.3 Characteristics impedance, methods of calculations & simple numerical.
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5 th	1 st	2.4 Losses in transmission line.
	2 nd	2.5 Standing wave – SWR, VSWR, Reflection coefficient, simple numerical.

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	4 th	2.6 Quarter wave & half wavelength line
6 th	1 st	2.7 Impedance matching & Stubs – single & double
	2 nd	2.8 Primary & secondary constant of X-mission line.
	3 rd	Unit-3: TELEVISION ENGINEERING. 3.1 Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses
	4 th	Unit-3: TELEVISION ENGINEERING. 3.1 Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses
7 th	1 st	3.2 TV Transmitter – Block diagram & function of each block
	2 nd	3.3 Monochrome TV Receiver -Block diagram & function of each block.
	3 rd	3.3 Monochrome TV Receiver -Block diagram & function of each block.
	4 th	3.4 Colour TV signals (Luminance Signal & Chrominance Signal,(I & Q,U & V Signals).
8 th	1 st	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
	2 nd	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 rd	3.6 Discuss the principle of operation - LCD display, Large Screen Display
	4 th	3.6 Discuss the principle of operation - LCD display, Large Screen Display
9 th	1 st	3.7 CATV systems & Types & networks
	2 nd	3.8 Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & Digital TV receiver Video programme processor unit.
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	4 th	Unit-4: MICROWAVE ENGINEERING. 4.1 Define Microwave Wave Guides.
10 th	1 st	4.2 Operation of rectangular wave gives and its advantage
	2 nd	4.3 Propagation of EM wave through wave guide with TE & TM modes
	3 rd	4.3 Propagation of EM wave through wave guide with TE & TM modes
	4 th	4.4 Circular wave guide
	5 th	4.4 Circular wave guide
11 th	1 st	4.5 Operational Cavity resonator.
	2 nd	4.5 Operational Cavity resonator.
	3 rd	4.6 Working of Directional coupler, Isolators & Circulator.
	4 th	4.6 Working of Directional coupler, Isolators & Circulator.

12 th	1 st	4.7 Microwave tubes-Principle of operational of two Cavity Klystron.
	2 nd	4.7 Microwave tubes-Principle of operational of two Cavity Klystron.
	3 rd	4.8 Principle of Operations of Travelling Wave Tubes
	4 th	4.9 Principle of Operations of Cyclotron
13 th	1 st	4.10 Principle of Operations of Tunnel Diode & Gunn diode
	2 nd	4.10 Principle of Operations of Tunnel Diode & Gunn diode
	3 rd	Unit-5: Broadband communication 5.1 Broadband communication system-Fundamental of Components and Network architecture
	4 th	5.2 Cable broadband data network- architecture, importance & future of broadband telecommunication internet based network.
14 th	1 st	5.2 Cable broadband data network- architecture, importance & future of broadband telecommunication internet based network.
	2 nd	5.3 SONET(Synchronous Optical Network)-Signal frame components topologies advantages applications, and disadvantages
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	4 th	5.4 ISDN - ISDN Devices interfaces, services, Architecture, applications,
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	2 nd	5.5 BISDN -interfaces & Terminals, protocol architecture applications

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	4 th	REVISION