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| **LESSON PLAN (WINTER-2025)** |
| **Discipline: EEE** | **Semester: 5th** | **Name of the Teaching Faculty: RAJEEV RANJANSETH** |
| **SUBJECT:WAVE PROPAGATION & BROADBAND COMMUNICATION****ENGINEERING** | **No of Days/per week class allotted: 4** | **Semester From date: 14.07.2025 To date: 15. 11.2025 No of Weeks:19** |
| **Week** | **ClassDay** | **Theory/PracticalTopics** |
| **1st** | 1st | **Unit-1:WAVE PROPAGATION & ANTENNA (12)**1.1Effects of environments such as reflection, refraction, interference, diffraction,Absorption and attenuation (Definition only) |
| 2nd | 1.2 Classification based on Modes of Propagation-Groundwave, Ionosphere , Skywave 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 | 1.5Definition-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: Monopole and dipole antenna and omnidirectionalantenna |
| **3rd** | 1st | Continue |
| 2nd | 1.7 Operation of following antenna with advantage & applications. a) Directionalhigh frequency antenna , Yagi & Rhombus 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 |

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| **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&VSignals). |
| 4th | 3.5 Types of Televisions by Technology-cathode-ray tubeTVs, 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 waveguides and its advantage. |
| 2nd | 4.3 Propagation of EM wave through waveguide 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 operation of two Cavity Klystron. |
| 4th | Continue |
| **12th** |  | PUJA HOLIDAY |
| **13th** | 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 |
| **14 th** | 1st | **Unit-5:Broadband communication (10)**5.1 Broadband communication system-Fundamental of Components and |
| 2nd | Continue |
| 3rd | Network architecture |
| 4th | Continue |
| 15th | 1st | 5.2Cable broadband data network- architecture |
| 2nd | Continue |
| 3rd | Importance & future of broadband telecommunication internet based network. |
| 4th | Continue |
| **16th** | 1st | 5.3SONET(SynchronousOpticalNetwork)-Signalframecomponentstopologies |
| 2nd | Continue |
| 3rd | Advantages applications, and disadvantages |
| 4th | Continue |
|  | 1st | 5.4 ISDN- ISDN Devices interfaces, |

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| **17th** | 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 |
| Signature of the Faculty |