**LESSON PLAN**

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| **Discipline:**  E&TC Engg. | **Semester:**  Fifth (5th ) | **Name Of The Faculty:**  Er Abadul Sajid Khan |
| **Subject:**  WAVE PROPAGATION AND BROADBAND COMMUNICATION ENGINEERING | **No of days/ week class allotted:**  Five(5) | **Semester from date:**.01.07.2024 **to Date**: 08.11**.**2024  **No of weeks: 15** |
| **WEEK** | **CLASS DAY** | **THEORY TOPICS** |
| 1st | 1st | **Basic Introduction** |
| 2nd | **Chapter No.- 01(Wave Propagation & Antenna)**  Effects of environments such as reflection, refraction, interference, |
| 3rd | Diffraction, absorption and attenuation (Definition only) |
| 4th | Classification based on Modes of Propagation-Ground wave, Ionosphere |
| 5th | Sky wave propagation, Space wave propagation |
| 2nd | 1st | Definition – critical frequency, max. useable frequency, skip distance, fading, Duct propagation |
| 2nd | Troposphere scatter propagation actual height and virtual height |
| 3rd | Radiation mechanism of an antenna-Maxwell equation |
| 4th | Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, |
| 5th | Efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern |
| 3rd | 1st | Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna |
| 2nd | 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 | Basic Concepts of Smart Antennas- Concept and benefits of smart antennas |
| 5th | ***Monthly Test- 1*** |
| 4th | 1st | **REVIEW** |
| 2nd | **Chapter No.- 02:Transmission Lines**  Fundamentals of transmission line |
| 3rd | Equivalent circuit of transmission line & RF equivalent circuit |
| 4th | Characteristics impedance, methods of calculations & simple numerical |
| 5th | Losses in transmission line |
| 5th | 1st | Standing wave – SWR, VSWR, Reflection coefficient, |
| 2nd | Simple numerical |
| 3rd | Quarter wave & half wavelength line |
| 4th | Impedance matching & Stubs – single & double |
| 5th | Primary & secondary constant of X-mission line. |
| 6th | 1st | **REVIEW** |
| 2nd | **Chapter No.- 03(Television Engineering)**  Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth |
| 3rd | Interlaced scanning, Composite video signal, Synchronization pulses |
| 4th | TV Transmitter – Block diagram & function of each block. |
| 5th | ***Monthly Test- 2*** |
| 7th | 1st | Monochrome TV Receiver -Block diagram & function of each block |
| 2nd | Colour TV signals (Luminance Signal & Chrominance Signal,( I & Q,U & V Signals). |
| 3rd | Types of Televisions by Technology- cathode-ray tube TVs, Plasma Display Panels |
| 4th | Digital Light Processing (DLP),Liquid Crystal Display (LCD), |
| 5th | Organic Light-Emitting Diode (OLED) Display, Quantum Light-Emitting Diode (QLED) – only Comparison based on application |
| 8th | 1st | Discuss the principle of operation - LCD display, Large Screen Display. |
| 2nd | CATV systems & Types & networks |
| 3rd | Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & |
| 4th | Digital TV receiver Video programme processor unit. |
| 5th | **REVIEW** |
| 9th | 1st | **Chapter No.- 04 (Microwave Engineering)**  Define Microwave Wave Guides. |
| 2nd | Operation of rectangular wave gives and its advantage. |
| 3rd | Propagation of EM wave through wave guide with TE |
| 4th | TM Modes |
| 5th | ***Monthly Test- 3*** |
| 10th | 1st | Circular wave guide. |
| 2nd | Operational Cavity resonator |
| 3rd | Working of Directional coupler, |
| 4th | Isolators & Circulator |
| 5th | Microwave tubes-Principle of operational of two Cavity Klystron. |
| 11th | 1st | Continue... |
| 2nd | Principle of Operations of Travelling Wave Tubes |
| 3rd | Principle of Operations of Cyclotron |
| 4th | Principle of Operations of Tunnel Diode & |
| 5th | ***Monthly Test- 4*** |
| 12th | 1st | Gunn diode |
| 2nd | **REVIEW** |
| 3rd | **Chapter No.- 05 (Broadband Communication)**  Broadband communication system-Fundamental of Components |
| 4th | Network Architecture |
| 5th | Cable broadband data network- architecture, |
| 13th | 1st | Importance & future of broadband telecommunication internet based network.system |
| 2nd | SONET(Synchronous Optical Network)-Signal frame components topologies |
| 3rd | Advantages, Applications and Disadvantages |
| 4th | ISDN - ISDN Devices interfaces |
| 5th | services, Architecture, applications, |
| 14th | 1st | BISDN -interfaces & Terminals, |
| 2nd | Protocol architecture applications |
| 3rd | **REVIEW** |
| 4th | Review Class for Chapter No.- 01 |
| 5th | Review Class for Chapter No.- 02 |
| 15th | 1st | Review Class for Chapter No.- 03 |
| 2nd | Review Class for Chapter No.- 04 |
| 3rd | Review Class for Chapter No.- 05 |
| 4th | Previous Year (W- 22) Question Answer Discussion |
| 5th | Previous Year (W- 21) Question Answer Discussion |