**LESSON PLAN**

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| **Discipline:**  ET & C. Engg. | **Semester:**  Sixth (6th) | **Name of the Faculty:**  Er Debasmita Mohapatra |
| **Subject:**  Advance Communication Engg. (TH-1) | **No. of days/week class allotted:**  Six (6) | **Semester from Date:16.01.24 to Date:26.04.24**  **No. of Weeks:** 15 |
| **WEEK** | **CLASS DAY** | **THEORY TOPICS** |
| 1st | 1st | **Chapter No.- 01 (Radar & Navigation Aids)**  Basic Radar, advantages & applications |
| 2nd | Working principle of simple Radar system, its types. |
| 3rd | Radar range equation & Performance factor of radar. |
| 4th | Working principle of Pulsed Radar System |
| 5th | State the function of radar indication and working principle of moving target indicator |
| 6th | Define Doppler effect & working principle of C.W radar |
| 2nd | 1st | Explain the radar aids to Navigation |
| 2nd | MTI Radar-Working Principle |
| 3rd | Air Craft Landing System |
| 4th | Explain the concept of Navigation Satellite System. (NAVSAT) GPS System |
| 5th | ***Possible Question Answer Discussion*** |
| 6th | **Chapter No.- 02 (Satellite Communication)**  Basic Satellite Transponder & Kepler’s Laws |
| 3rd | 1st | Define Satellite Orbital patterns and elevation ( LEO,) categories |
| 2nd | Define Satellite Orbital patterns and elevation ( MEO & GEO) categories |
| 3rd | Concept of Geostationary Satellite, Calculate its height |
| 4th | Calculate the velocity & roundtrip time delay, Their advantage & disadvantage . |
| 5th | Working of Satellite sub system |
| 6th | Satellite frequency allocation and frequency bands |
|  | 1st | Describe General structure of satellite Link system (Uplink, Down link, Transponder, Crosslink) |
| 2nd | Explain the working principle of direct broadcast system (DBS) |
| 4th | 3rd | Explain the working principle of VSAT system. |
| 4th | Define multiple accessing & name various types. |
|  | 5th | Discuss the Time Division Multiple Accessing (TDMA)  Code Division Multiple Accessing (CDMA) Block diagram & its advantages & dis-advantages |
| 6th | **Monthly Test-1** |
| 5th | 1st | Describe Satellite Application- Communication. Satellite (MSAT), Digital Satellite Radio. |
| 2nd | Working Principle of GPS Receiver & Transmitter & applications |
| 3rd | Optical Satellite Link transmitter & Receiver |
| 4th | ***Possible Question Answer Discussion*** |
| 5th | **Chapter No.- 03 (Optical Fiber Communication)**  Basic Principle of optical communication |
| 6th | Compare the advantage and disadvantage of optical fiber metallic cables |
| 6th | 1st | Define Electromagnetic Frequency and wave line spectrum |
| 2nd | Types of optical fibre and principle of propagation in a fiber using Ray Theory |
| 3rd | Describe fiber construction |
| 4th | Define terms: Velocity of propagation, Critical angle Acceptance angle & numerical aperture |
| 5th | Discuss Optical Fiber Communication System, block diagram & working Principle |
| 6th | Define the modes of propagation, Index profile of optical fiber |
| 7th | 1st | Describe the types optical fiber configuration & Single-mode step index ,Multi - mode step index, Multi-mode Graded index |
| 2nd | Attenuation in optical fibers-Absorption losses, Scattering Losses, Bending Losses, Cladding Losses Dispersion-material Dispersion, Waveguide Dispersion, Intermodal Dispersion |
| 3rd | Optical Sources (Transmitter) & Types -LED-Semiconductor laser diode |
| 4th | **Monthly Test-2** |
| 5th | Define LASER, its working Principle, Block Diagram using Laser feedback control circuit. |
| 6th | Explain Optical Detectors-PIN and APD diodes & Block diagram using APD Connectors and splices-optical cables-Couplers. |
| 8th | 1st | Optical repeater & single channel system.  Applications of optical fibers-civil, industry and military application |
| 2nd | Explain concept of Wave Length Division Multiplexing (WLDM) principles |
| 3rd | ***Possible Question Answer Discussion*** |
| 4th | **Chapter No.- 04 (Telecommunication System)**  Working of Electronic Telephone System. (Telephone Set) |
| 5th | Discuss the function of switching system & Call procedures |
| 6th | Discuss the principle of space &Time switching |
| 9th | 1st | Discuss the numbering plan of telephone  networks (National Schemes Numbering) |
| 2nd | Discuss the numbering plan of telephone  networks (International Numbering) |
| 3rd | Working Principle of a PBX, |
| 4th | **Monthly Test-3** |
| 5th | Digital EPABX |
|  | 6th | Define units of Power Measurement |
| 10th | 1st | Describe the principle of Internet Protocol Telephone |
| 2nd | Describe the principal of Internet Telephone |
| 3rd | ***Possible Question Answer Discussion*** |
| 4th | **Chapter No.- 05 (Data Communication)**  Basic concept of Data Communication |
| 5th | Architecture, protocol & standards |
| 6th | Data Communication Circuits |
| 11th | 1st | Types of Transmission |
| 2nd | & Transmission Modes |
| 3rd | Data Communication codes |
| 4th | Basic idea of error control |
| 5th | & Error Detection |
| 6th | MODEM & its Basic block diagram |
| 12th | 1st | & common feature Voice Band modem |
| 2nd | ***Possible Question Answer Discussion*** |
| 3rd | **Monthly Test-4** |
| 4th | **Chapter No.- 06 (Wireless Communication)**  Basic concept of Cell phone, frequency reuse channel assignment strategic handoff Co-channel interference |
| 5th | & system capacity of cellular Radio system |
| 6th | Concept of improving coverage & capacity in cellular system (Cell splitting & sectoring) |
| 13th | 1st | Wireless system & its standards |
| 2nd | Discuss GSM (Global System of Mobile) service & features |
| 3rd | Architecture of GSM system & GSM mobile station |
| 4th | & channel types of GSM system |
| 5th | Working of forward & reverse CDMA channel, |
| 6th | the frequency & channel specifications |
| 14th | 1st | Architecture & feature of GPRS |
| 2nd | Discuss the mobile TCP, IP protocol |
| 3rd | Working of Wireless Application Protocol (WAP) |
| 4th | Features of SMS, MMS,1G. 2G,3G |
| 5th | 4G &5G Wireless network. |
| 6th | Smart phone & discuss its feature indicate through Block diagram. |
| 15th | 1st | ***Possible Question Answer Discussion*** |
| 2nd | Review Class for Chapter No.- 01 |
| 3rd | Review Class for Chapter No.- 02 |
| 4th | Review Class for Chapter No.- 03 |
| 5th | Review Class for Chapter No.- 04 |
| 6th | Review Class for Chapter No.- 05 |

Coverage of Syllabus up to Internal Exam(I.A.)- Chapers-1,2,3&4.