**CURRICULUM PLAN 2021-22**

Even Semester: II, IV, VI

**Dr. Savita Sharma**

Department of Physics

**B.Sc(H) Physics – III year, VI Sem**

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| Content | Allocation of Lectures | Month-wise Schedule followed | Tutorial/assignment/  presentation etc |
| **Communication Systems** | | |  |
| **Electronic Communication :**  Introduction to communication – means and modes. Need for modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base-band signals. Concept of Noise, signal-to-noise (S/N) ratio. | 8 | 3-Jan to 13-Jan | Syllabus Overview  Reference books  Problem solving  Derivations and Numericals |
| **Analog Modulation**  Amplitude Modulation, modulation index and frequency spectrum. Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver | 12 | 17-Jan to 3-Feb | Derivations and  Numericals  Class test on unit end  Discussion of  Important questions |
| **Analog Pulse Modulation :** Channel capacity, Sampling theorem, Basic PrinciplesPAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing | 9 | 7-Feb to 21-Feb | Derivations and  Numericals  Discussion of  Important questions  Home Register Checking |
| **Digital Pulse Modulation:** Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Binary Phase Shift Keying (BPSK). | 10 | 23-Feb to 10-March | Derivations and  Numericals |
| **Satellite Communication:**  Introduction, need, Geosynchronous satellite orbits, geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink. | 10 | 14-March to 31-March | Derivations and  Numericals  Class Test  Revision Session  Assignment given for IA |
| **Mobile Telephony System :** Basic concept of mobile communication, frequency bands 55 used in mobile communication, concept of cell sectoring and cell splitting, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitative only). | 10 | 04-March to 18-April | Derivations and  Numericals Discussion of last year papers and clarification of doubts  Revision of Syllabus  Home register Checking |
| **GPS navigation system :** GPS navigation system (qualitative idea only) | 1 | 20 April-21 April | Derivations |