**Name:** **Chandra Bhan**  **Subject** : **Satellite and Radar Systems**

**Subject Code: NEC-045 Total lectures: 50**

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| **Units** | **Lect. No** | **Topics** | **Remarks** |
| **Unit 1** | 1 | Introduction to Radar |  |
| 2 | Radar block diagram and operation |
| 3 | Radar frequencies |
| 4 | Radar equation |
| 5 | Detection of signals in noise |
| 6 | Receiver noise and the signals to noise ratio |
| 7 | Probabilities of detection and false alarm |
| 8 | Integration of radar pulses |
| 9 | Radar Cross–section of targets |
| 10 | Radar cross section of fluctuation |
| 11 | Transmitter Power |
| 12 | Pulse repetition Frequency |
| 13 | Antenna parameters |
| 14 | System Losses |
| **Unit 2** | 15 | Introduction to Doppler and MTI Radar |
| 16 | Delay Line cancellers |
| 17 | Staggered Pulse Repetition Frequencies, Doppler Filter Banks |
| 18 | Digital MTI Processing |
| 19 | Moving Target Detector |
| 20 | Limitations to MTI Performance |
| **Unit 3** | 21 | Tracking Radar: Sequential lobing |
| 22 | Conical scan |
| 23 | Mono-pulse Tracking |
| 24 | Low angle tracking |
| 25 | Tracking in range |
| 26 | Elements of Satellite Communications |
| 27 | Orbital mechanics |
| 28 | Look angle and orbit determination |
| 29 | Launches and launch vehicle, orbital effects |
| 30 | Introduction to geo-synchronous geo-stationary satellites |
| **Unit 4** | 31 | Satellite sub-systems: Attitude and Orbit control systems |
| 32 | Telemetry, Tracking and command control system |
| 33 | Power supply system |
| 34 | Introduction to satellite link design |
| 35 | Basic transmission theory |
| 36 | Design of down link and uplink |
| 37 | System noise temperature and G/T ratio |
| 38 | Design of satellite links for specified C/N |
| 39 | Satellite data communication protocols |
| **Unit 5** | 40 | Direct broadcast satellite television and radio |
| 41 | Satellite navigation |
| 42 | Global positioning systems |
| 43 | GPS position location principle |
| 44 | GPS receivers and codes |
| 45 | Satellite Signal Acquisition |
| 46 | GPS navigation Message |
| 47 | GPS Signal Levels |
| 48 | Timing Accuracy |
| 49 | GPS Receiver Operation |