Course Code: ICE 3251
Course Title: Satellite Communication
Credit: 3.00, 75 Marks, 3 Hours/week, Lectures: 42, Exam time: 3 hours

Section – A

Introduction to Satellite Communication: Basic concepts of Satellite Communications, Kepler's First Law, Kepler's Second Law, Kepler's Third Law, Definitions of Terms for Earth-Orbiting Satellites, Orbital Elements, Apogee and Perigee Heights, Orbit Perturbations, inclined orbits.

The Geostationary Orbit: Introduction, Antenna Look Angles, the Polar Mount Antenna, Limits of Visibility, Near Geostationary Orbits, Earth Eclipse of Satellite, Launching Orbits.

Polarization: Introduction, Antenna Polarization, Polarization of Satellite Signals, Cross Polarization Discrimination, Ionospheric Depolarization, Rain Depolarization, Ice Depolarization.

The Space Link: Introduction, Equivalent Isotropic Radiated Power, Transmission Losses, The Link-Power Budget Equation, System Noise, Carrier-to-Noise Ratio, The Uplink, Downlink, Combined Uplink and Downlink C/N Ratio, Inter-Satellite links.

Section – B

The Space Segment: Introduction, the Power Supply, Attitude Control, Station Keeping, Thermal Control, Transponders, the Antenna Subsystem.

The Earth Segment: Introduction, Receive-Only Home TV Systems, Master Antenna TV System, Community Antenna TV System, Transmit-Receive Earth Stations.

Satellite Access: Introduction, Single Access, Preassigned FDMA, Demand Assigned FDMA, Spade System, TDMA, Preassigned TDMA, Demand-assigned TDMA, Satellite-Switched TDMA, Code Division Multiple Access.

Satellite Mobile and Specialized Services: Introduction, Satellite Mobile Services, VSATs, Radarsat, Global Positioning Satellite System (GPS), Orbcomm, Iridium.

Text Books:

1. **Dennis Roddy:** *Satellite Communication*

Reference Books:

1. **Tri T. Ha :** *Digital Satellite Communication*
2. **Sudhir K Pand :** *Handbook of Satellite Communication*
3. **Robert A. Nelson :** *Satellite Communication System Engineering*