

## **Satellite Communication & Remote Sensing**

**EC801C**

**Contacts: 3L**

**Credits: 3**

Historical background, Basic concepts, Frequency allocation for satellite services, orbital & spacecraft problems, comparison of networks and services, modulation techniques used for satellite communication.

(2)

Orbits- Two body problem, orbital mechanics, geostationary orbit, change in longitude, orbital maneuvers, orbital transfer, orbital perturbations. (2)

Launch Vehicles- principles of Rocket propulsion, powered flight, Launch vehicles for communication satellite (1)

RF link- noise, the basic RF link, satellite links (up and down) , optimization RF link, intersatellite link, noise temperature, Antenna temperature, overall system temperature, propagation factors, rain attenuation model. Tropospheric and Ionospheric EFFECT. (5)

Multiple access- FDMA, TDMA, CDMA techniques, comparison of multiple access techniques, error correcting codes. (5)

Satellite subsystems and satellite link design- AOCS, TT&C , power system, spacecraft antenna, transponder, Friis transmission equation, G/T ratio of earth station. (6)

Remote Sensing:

1. Basic of remote sensing, Electromagnetic Radiation principles, Atmospheric window, Indian satellite sensing satellite system, Active, Passive, ground based and space based remote sensing. (3)

2. Spatial, spectral, Radiometric and temporal resolution, satellite sensors, detectors and scanning technique, FOV and error sources, Image analysis and Interpretation weather RADAR, LIDAR, acoustic sounding systems, TRMM, AURA-MLS, Megha Tropiques Altimeter , Scatterometer, Radiometer. (9)

3. Ground based and radio occultation techniques, spectral response of water, Sea surface temperature, wind speed, colour monitor, clouds and aerosol, water vapor, convective system, Trace gases. (7)

### **Ref.:**

Remote Sensing and GIS - B. Bhatta (Oxford University Press)

Remote sensing of the Environment – J.R. Jensen (Pearson)

Global Navigation satellite systems - B. S. Rao (TMH)

Satellite communication – D. Roddy (TMH)

Remote Sensing - R.A. Schowengerdt (Academic Press)