MICROWAVE AND SATELLITE COMMUNICATIONS

17ECMC1T6D **Credits: 4**

Lecture: 4 periods/week **Internal assessment: 40 marks**

Semester end examination: 60 marks

Prerequisites: Microwave Engineering, Satellite Communication Systems.

Course Objectives:

- Understand the principles and operation of various subsystems of microwave communication systems
- Will be able to identify earth station configuration and address performance requirements.
- Conceptualize various satellite network architectures that are in use.
- Understand the usage of launch vehicles & their operations.

Course Outcomes:

Students will be able to

- Demonstrate the operation of various subsystems of microwave communication systems
- Configure and manage performance requirements
- Describe the satellite network architectures
- Suggestsuitable launch vehicles depending on the requirements

UNIT-I

Microwave Link Engineering: Propagation on earth satellite link-basic microwave propagation, isotropic radiator, directional properties of antennas, propagation (linear & circular), propagation losses, microwave transmitters, receivers, overall link quality.

UNIT-II

Earth Station and Network Technology: Basic earth station configurations, performance requirements, radio frequency equipment, intermediate frequency and baseband equipment, earth station facility design, major classes of earth stations.

UNIT-III

Satellite Network Architectures: General features of satellite networks, point-to-point networks, VSAT networks, Satellite Operations and Control – satellite control system, intercommunication networks, network operations.

UNIT-IV

Launch Vehicles and Services: Non-Geo missions, geostationary transfer orbit, drift orbit, deployment and in-orbit testing, launch technology and systems, typical launch vehicles, launch interfaces, Risk management in launch & operation.

Text Books:

1. Bruce R Elbert, "Introduction to Satellite communication" 3rd edition,Artech House, 2008

Reference Books:

1. Gerard Maral, Michel Bousquet, Zhili Sun,"Satellite Communications Systems: Systems, Techniques and Technology", 5th edition, Wiley, 2009.