MSc (IT) 1st Semester

Subject Code: MS 22

Subject Name: Advanced Communication Networks

Block 1 – Wireless Communication Principles

Unit 1- Wireless Communication Principles: Introduction, Elements of a Wireless Communication System, Simplex and Duplex Communication, Analog and Digital Transmissions, Analog and Digital Multiplexing, Frequency Division Multiplexing (FDM), Frequency Division Duplexing (FDD), Time Division Multiplexing (TDM), Synchronous TDM, Statistical TDM.

Unit 2- Modulation Techniques: Why Digital Modulation, Trading Off Simplicity And Bandwidth, Industry Trends, Transmitting Information, Signal Characteristics That Can Be Modified, Polar Display - Magnitude And Phase Represented Together, Signal Changes Or Modifications In Polar Form, Amplitude Modulation, Frequency and Phase Modulation, Pulse-Code Modulation.

Unit 3- Wireless Network Technologies: The Wireless Network Channel, Propagation Loss, Interference, Frequency Selectiveness, Time Selectiveness, Multipath, Diversity, Resource Management in Wireless Networks, Mobility Management in Mobile Networks, Handoff, Registration, Traffic Routing in Wireless Networks, First- and Second-Generation Cellular Radio Network, Deficiencies of First- and Second-Generation Wireless Systems, Second-Generation Cellular Networks Offering Wireless Data Services, Third-Generation Wireless Networks and Wireless LANs

Block 2 – Optical Communication and networks

Unit 1- Optical Networks Architecture: Introduction, Optical Networks Architecture, Long-Haul Optical Networks, Regional/Metro Optical

Networks, Optical Access Networks (OAN), All-Optical Networks — The Wave Of The Future.

Unit 2- **Optical Wireless Communication:** Technology Overview, Radio & IR For Wireless Communication, System Configurations, Design Fundamentals, Power Budget Considerations.

Unit 3- **Multiprotocol Label Switching:** Introduction, MPLS Basics, MPLS Protocol Stack Architecture, MPLS Applications, Virtual Private Network (VPN), Traffic Engineering, IP and ATM Integration, Generalized MPLS.

Unit 4- **Enabling WDM Technologies:** Introduction, Enabling WDM Technologies, Access Networks, Point-To-Point Topologies, Passive Optical Networks, Optical Wireless Technology (Free Space Optics), Metropolitan Networks, Optical Packet Switching.

Unit 5- **Concept of IP/ATM/SONET over WDM:** Introduction, IP Over WDM— The Data Plane Perspective, Control Plane Integration, The Management Plane Approach.

Block 3 – Photonic packet Switching

Unit 1- **Photonic Packet Switching:** Introduction, A Brief Introduction To Photonic Devices, Switch Architecture Review, Multiple Output Port Optical Network Switch.

Unit 2- **Network Management:** Introduction, The Importance of Network Management, Ingredients Of Network Management, SNMP: Classic and Perennial Favorite, SNMP Operations.