PVP 22

OPTICAL NETWORKS

22ECMC2T4 **Credits: 4**
Lecture: 3 Periods/week **Internal assessment: 40marks**
Semester end examination: 60marks

Prerequisites: Optical communications, computer networks.

Course Outcomes:
At the end of the course Student will be able to

- Understand layers of optical networks (L2)
- Design and construct WDM network elements (L4)
- Analyze optical networks (L4)
- Analyze the protection schemes of optical networks (L4)

UNIT I
Client Layers of Optical Networks: SONET / SDH – Multiplexing, Frame Structure, Physical Layer, Infrastructure, ATM – Functions, Adaptation layers, QoS, Flow Control Signalling and Routing, IP –Routing, QoS, MPLS, Storage Area Networks – ESCON, Fiber Channel, HIPPI, Gigabit Ethernet

UNIT II
WDM network Elements and Design: Optical Line Terminals and Amplifiers, Add/Drop Multiplexers, Optical Cross Connects, Cost trade-offs in Network Design, LTD and RWA Problems, Dimensioning – Wavelength Routing Networks

UNIT III
Network Control and Management: Network Management Functions, Optical Layer Services and Interfacing, Layers within Optical Layer, Multivendor Interoperability, Performance and Fault Management, Configuration Management, Optical Safety

UNIT IV
Network Survivability: Basic Concepts of Survivability, Protection in SONET/SDH Links and Rings, Protection in IP Networks, Optical Layer Protection – Service Classes, Protection Schemes, Interworking between Layers. Network Architecture, Enhanced HFC, FTTC

Learning Resources

Text Books

1. Rajiv Rama swami and Kumar N. Sivarajan, Optical Networks: A Practical Perspective, 2nd Ed., 2004, Elsevier Morgan Kaufmann Publishers
2. C. Siva Rama Murthy and Mohan Guruswamy WDM Optical Networks: Concepts, Design and Algorithms – 2nd Ed., 2003, PEI

Reference Books

1. Harold Kolimbris, Fiber Optics Communication, 2nd Ed., 2004, PEI
2. Govind Agarwal, Optical Fiber Communications, 2nd Ed., 2004, TMH
3. S.C.Gupta, Optical Fiber Communications and Its Applications, 2004, PHI