CS322: Optical Networks	L	T	P	Physics, Mathematics
	3	1	0	

Course Objective: To introduce the concepts of digital logic, functioning and design of digital devices, logic families, electronic memory and related devices.

S. No.	Course Outcomes (CO)
CO1	Understand SONET/SDH and Dense Wavelength-Division Multiplexing (DWDM).
CO2	Explain Time-Division Multiplexing (TDM) and its network elements.
CO3	Describe fiber-optic technologies and their applications.
CO4	Implement and analyze Wavelength-Division Multiplexing (WDM) systems.
CO5	Understand SONET architectures and protection strategies.
CO6	Explain SDH architectures and protection methods.

S. No	Contents	Contact Hours
UNIT 1	Introduction to Optical Networking: Introduction to SONET/SDH, SONET/SDH, Dense Wavelength-Division Multiplexing,The Future of SONET/SDH and DWDM.	8
UNIT 2	Time-Division Multiplexing: Introduction to Time-Division Multiplexing, Analog Signal Processing, Circuit-Switched Networks, The T-Carrier, The E-Carrier, ISDN, TDM, Network Elements	8

UNIT 3	Fiber-Optic Technologies: A Brief History of Fiber-Optic Communications, Fiber-Optic Applications, The Physics Behind Fiber Optics, Optical-Cable Construction, Propagation Modes, Fiber-Optic Characteristics, Fiber Types, Fiber-Optic Cable Termination, Splicing, Physical-Design Considerations, Fiber-Optic Communications System, Fiber Span Analysis.	**8**
UNIT 4	Wavelength-Division Multiplexing: The Need for Wavelength-Division Multiplexing, Wavelength-Division Multiplexing, Coarse Wavelength-Division Multiplexing, Dense Wavelength-Division Multiplexing, The ITU Grid, Wavelength-Division Multiplexing Systems, WDM Characteristics and Impairments to Transmission, Dispersion and Compensation in WDM.	**8**
UNIT 5	SONET Architectures: SONET Integration of TDM Signals, SONET Electrical and Optical Signals, SONET Layers, SONET Framing, SONET Transport Overhead, SONET Alarms, Virtual Tributaries, SONET Multiplexing, SONET Network Elements, SONET Topologies, SONET Protection Architectures, SONET Ring Architectures, SONET Network Management.	**8**
UNIT 6	SDH Architectures:SDH Integration of TDM Signals, SDH Layers, SDH Multiplexing, SDH Framing, SDH Transport Overhead, SDH Alarms, SDH Higher-Level Framing, SDH Network Elements, SDH Topologies, SDH Protection Architectures, SDH Ring Architectures, SDH Network Management.	**8**
	Total	**48**