SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Electronics)
Semester: IV
Syllabus with Effect from: June - 2014

Paper Code: PS04CELE02	**Total Credit: 4**
Title Of Paper: Fiber Optics & Its Application	

Unit	Description in detail	Weightage (%)
I	Light propagation-Ray theory transmission-meridional rays, another alternative path –skew rays, Types, characteristics and data rate in optical fibers, Modes in fibers, Modes coupling, Transmission characteristics in optical fibers- attenuation, absorption, scattering, polarization, dispersion-intermodal and intra modal , Bandwidth and data rate, Fiber materials- Fiber fabrication and preparation, splicing, connectors, couplers and switches, connection losses, Mechanical properties of fibers, Installation and handling considerations in fiber types.	25%
II	Optical absorption and emission, Spontaneous and stimulated emission Optical sources -LED AND LASER-Optical feedback and laser oscillation Quantum –well lasers , their structures and characteristics, Drive Electronics LED drivers - digital and analog, Laser diode drivers.	25%
III	Optical detectors- Principle of operation –photo detectors, P-N, PIN, Avalanche photodiode, Phototransistor, Delectability, Noise and bandwidth, Detector circuitry and receivers-preamplifier, Automatic gain control	25%
IV	Fiber optic communication system –Optical Time Division Multiplexing, Wave length Division Multiplexing- Demultiplexing, Bandwidth and rise time budgets, Noise and Bit Error Rate and eye Pattern, Optical Fiber measurement and field testing- Equipment used in field testing- Optical Power meter, Cut back method, Optical Time Domain Reflectometer (OTDR),Application of Fiber optics- Long –Haul communication, Fiber optic sensors, Local Area Networks, Fiber Distributed Data Interface Telephone communication, Medical and military applications, ISDN	25%

Basic Text & Reference Books:-

- **Optical Fiber Communication- Principle and practice**
  John M. Senior, Prentice Hall of India
- **Fiber optic communication and other applications**
  Henry Zanger & Cynthia Zanger, Maxwell Macmillan International Edition
- **An Introduction toOptical Fibers**
  Allen H. Cherin, Mcgrow Hill International Edition
- **Optical Fiber Communication**
  Gerd Keiser, Mcgrow Hill International Edition