PROFESSIONAL ELECTIVES (PE):

PET5J001 FIBER OPTICS AND OPTOELECTRONIC DEVICES

MODULE- I

1. Fundamental of fiber optics, Different generations of optical fiber communication systems. Optical fiber structure, Fiber types, step index fiber and graded index fiber, ray propagation, total internal reflection, Numerical Aperature, acceptance angle. Wave propagation in a cylindrical wave guides, modal concept, V-number, power flow in step index fiber and graded index fiber, attenuation (absorbtion, scattering and bending) and dispersion (inter and intramodal, chromatic, wave guide and polarization) in fiber, dispersion shifted and dispersion flattened fiber

MODULE-II

2. Fiber fabrication, Double crucible method, Fiber optic cables, Connector and splice. Losses during coupling between source to fiber, fiber to fiber. Schemes for coupling improvement. Optoelectronic Sources, LED, ILD, light source materials, Radiation Pattern modulation capability.

MODULE- III

3. Optoelectronic Detector, PIN AND APD, Responsivity, Band width, Detector noise equivalent circuit and SNR calculation.
4. Optoelectronic Modulators, Basic principle, Electro optic and Acoustoptic modulators.

MODULE – IV

5. Optical Amplifier, Semiconductor optical Amplifier and Erbium Doped Fiber Amplifier.

Additional Module (Terminal Examination-Internal)

1. WDM components-couplers, isolators, circulators, filters. Optical switching-self electro optic effect Device, switching speed and energy

Text Books

1. Optical Fiber Communications, Keiser G, Tata McGraw Hill Education Private Limited, 4th Edition.
2. Optical Fiber Communication Principles and practice, Senior J, Prentice Hall of India.
3. Fiber optics and Optoelectronics, R.P.Khare, Oxford University Press.
4. Fiber-Optic Communication Systems, G P Agarwal,4th edition, John wiley& sons publication, 2011.

Reference Books

1. Fiber optic communications, Joseph C Palais, fourth edition, Pearson Education.
2. Semiconductor Optoelectronic Devices, PallabBhatttacharya, second edition, Pearson Education.