

THIRD YEAR

Optical Communication Systems	COE307
Prerequisite: COE104 and COE208	(2-2-0-0)

Overview of Optical Fiber Wave Guides: General system, transmission link, advantage of optical fiber communication ,basic structure of optical fiber waveguide, ray theory transmission, optical fiber modes and configuration, step index & graded index fiber, single mode fiber , fiber materials , fiber fabrication. Signal Degradation in Optical Fiber: attenuation, intrinsic & extrinsic absorption losses, linear & nonlinear scattering losses , bending losses , distortion in optical wave guide, intramodal and intermodal dispersion. Power launching and coupling Source to fiber power launching, power calculation, lensing schemes, fiber to fiber joints , fiber splicing technique , fiber connectors. Optical Sources: LASER basic concepts of laser, Optical emission from semiconductors. Detectors: p-n photodiodes, p-i-n photodiodes, Avalanche photodiodes, Quantum efficiency, speed of response, Phototransistor. Optical Receiver: Receiver operation, digital receiver noise, shot noise, pre-amplifier types, Digital receiver performance, introduction to analog receivers. Digital Transmission Systems: Point to point links, system considerations, link power budget , rise time budget, modulation formats for analog communication system, introduction to WDM concepts, Introduction to advanced multiplexing strategies.