

## Lecture Plan

**Name of Subject: Optical Communication**

**Subject Code: E16C604**

**Class: M.Tech ECE**

**Semester: 2nd**

<b>Unit/Section No.</b>	<b>Name of Topic</b>	<b>Number of Lectures Required</b>
Unit 1	(i) General communication system, Elements of fiber communication link	1
	(ii) advantages and disadvantages of optical fiber communication, application of optical fiber communication, limitation of optical fiber communication.	2
Unit 2	(i) Optical fiber cross sections and index profiles,	1
	(ii) propagation of light waves in optical fiber, Ray theory and electromagnetic mode theory for optical propagation	3
	(iii) step index and graded index fibers, critical angle, acceptance angle, numerical aperture	3
Unit 3	(i) Attenuation, material absorption, scattering losses (Rayleigh scattering), fiber bend losses, core and cladding losses.	4
	(ii) Dispersion in optical fiber, Intermodal dispersion, Intramodal dispersion, pulse spread by material dispersion, dispersion shifted fiber, dispersion flattened fiber	4
Unit 4	(i) Principle of LED, LED power and efficiency, characteristics of LED	4
	(ii) Basic concept of LASER, absorption and emission of radiation, population inversion, spontaneous	5

	emission, efficiency of LASER, LASER to fiber coupling, advantages of LASER over LED	
Unit 5	(i) Principle of optical detection, characteristics of photo detector, PN photo diode, PIN photo diode, response time of Photo diode	3
	(ii) Avalanche Photo diode, Silicon reach through Avalanche Photo diode, multiplication factor, Noise in APD.	3
Unit 6	(i) Drive circuits for LED operations, Drive circuits for LASER operations	3
	(ii) Optical receiver, Preamplifier, automatic gain control, homodyne and heterodyne deduction, phase diversity receiver	3
	(iii) Link Power Budget, Rise time budget, Optical TDM, WDM	3