

GOPAL KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY

GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005

LESSON PLAN

Name of the Subject: OPTICAL AND SATELLITE COMMUNICATION

Name of the Faculty: Subrat Prasad Rath

Semester: 6th Semester

Branch: ETC

Semester From:

No. of Weeks: 15 Weeks

Week	Day	Theory/ Practical Topics	Classes
		UNIT 1-Introduction	6
1	1.	Introduction, Ray theory transmission, Total internal reflection-Acceptance angle	1
	2.	Numerical aperture; Skew rays; Electromagnetic mode theory of optical propagation	1
	3.	EM waves, modes in Planar guide, phase and group velocity; cylindrical fibers, SM fibers	1
	4.	Transmission characteristics of optical fibers: Attenuation – Material absorption losses in silica glass fibers, Linear and Non linear Scattering losses	1
2	5.	Fiber Bend losses; Mid band and far band infrared transmission; Intra and inter Modal Dispersion – Over al Fiber Dispersion	1
	6.	Polarization: non linear Phenomena; Optical fiber connectors, Fiber alignment and Joint Losses; Fiber Splices, Fiber connectors, Expanded Beam Connectors : Fiber Couplers	1
	UNIT 2- Sources and detectors		6
	7.	Optical sources: Light Emitting Diodes	1
3	8.	LED structures, surface and edge emitters	1
	9.	mono and hetero structures: internal	1
	10.	quantum efficiency; injection laser diode structures	1
	11.	comparison of LED and ILD Optical Detectors: PIN Photo detectors	1
4	12.	Avalanche photo diodes, construction, characteristics and properties.	1
	UNIT 3- Fiber optic receiver and measurements		6
	13.	Fundamental receiver operation, Pre amplifiers	1
	14.	Fiber Attenuation measurements, Dispersion measurements	1
	15.	Fiber Refractive index profile measurements	1
5	16.	Fiber cut- off Wave length Measurements	1
	17.	Fiber Numerical Aperture Measurements	1
	18.	Fiber diameter measurements.	1
	UNIT 4- Introduction to state of sate lite communication		6
6	19.	Orbital mechanics and parameters	1
	20.	look angle determination, Launches and Lunch vehicle, Orbital effects in communication system performance	1

	21.	Attitude and orbit control system(AOCS), TT&C, Description of spacecraft System	1
	22.	Transponders, Equipment reliability and space qualification. Sate lite Link Design	1
	23.	Basics of transmission theory, system noise temperature and G/T ratio	
7	24.	Uplink and Downlink design, design of sate lite links for specified (C/N) performance	1
		UNIT 5- Analog telephone and television transmission	6
	25.	Energy dispersal, digital transmission Multiple Access	1
	26.	Multiplexing techniques for sate lite links	1
	27.	Comprehensive study on FDMA, TDMA and CDMA	1
8	28.	Spread Spectrum Transmission and Reception	1
	29.	Estimating Channel requirements, SPADE, Random access	1
	30.	Earth station Technology: Earth station design.	1
	31.		1

Books Recommended:

1. Optical Fiber Communication, Gerd Keiser, McGraw Hi l, Third Edition, 2000.
2. Optical Fiber Communication, John M. Senior, Pearson Education, Second Edition, 2007
3. Sate lite Communication by T. Pratt, C. Bostian. 2nd Edition, John Wiley Co.