C R Polytechnic,ROHTAK

Lesson Plan

Name of the Faculty : Dr Sukhbir Singh Kinha

Discipline : Electronics & Communication Engg.

Department : Electronics & Communication Engg.

Semester : 5th

Subject : Optical Fiber Communication

Lesson Plan Duration : 15 weeks(From 4.8.25 to 26.11.25)

Work load (Lecture / Practical) per week (in hours) : Lectures-03, Practicals -03

Week	Theory		Practical	
	Lecture day	**Topic (Including assignment / test)**	**Practical Day**	**Topic**
1st	1st	**UNIT 1. Introduction:**	1st (3Hours)	Setting up of fiber analog link
		Historical perspective		
	2nd	Basic communication systems, optical frequency range		
	3rd	Advantages of optical fibre communication, application of fibre optic communication		
2nd	4th	Electromagnetic spectrum used	2nd (3Hours)	Setting up to optic digital link
	5th	Advantages and disadvantages of optical communication.		
	6th	Principle of light penetration		
3rd	7th	Reflection, critical angle.	3rd (3Hours)	Measurement of various losses in optical fibers
	8th	**UNIT 2. Optical Fibers and Cables:**		
		Fiber types construction		
	9th	Multimedia and monomode fibers		
4th	10th	Step index and graded index fibers	4th (3Hours)	**Revision**
	11th	Acceptance angle		
	12th	Types of optical fiber cables		
5th	13th	**Revision/ Seminar/ Expert lecture**	5th (3Hours)	To observe and measure the splice or connector loss
	14th	**Assignment No. 1, Sessional Test - 1, Quiz**		
	15th	**UNIT 3. Losses in optical fiber cable:**		
		Absorption Losses, Bending loses.		
6th	16th	Scattering Losses, Radiation losses	6th (3Hours)	To measure and calculate numerical aperture of optical fiber

	17th	Compelling losses and Bending loses.		
	18th	Dispersion, Material dispersion		
7th	19th	wave guide dispersion	7th (3Hours)	To observe characteristics of optical source
	20th	Modal dispersion, total dispersion and bit rate.		
	21st	**UNIT 4. Optical sources**		
		Characteristics of light source used in optical communication, principle of operation of LED		
8th	22nd	Different type of LED structures used and their brief description	8th (3Hours)	To Splice the available optical fiber
	23rd	LED driving circuitry, Injection Laser diode		
	24th	Different types of injection laser diodes		
9th	25th	Comparison of LED and ILD, non semiconductor laser.	9th (3Hours)	To observe characteristics of optical detector
		UNIT 5. Optical Detector		
	26th	Characteristics of photo detectors used in optical communication		
	27th	PIN Diode		
	28th	Avalanche photo diode (APD)		
10th	29th	Noise in Detectors	10th (3Hours)	To Connectorise a fiber with connector at both ends
	29th	**Revision/ Seminar/ Expert lecture**		
	30th	**Assignment No. 2, Sessionals Test - 2, Quiz**		
Week	**Lecture day**	**Topic (Including assignment / test)**	**Practical Day**	**Topic**
11th	31st	**UNIT 6. Optical Amplifiers**	11th (3Hours)	To identify and use various components and Tool used in optical fiber communication.
		Type of optical Amplifiers		
	32nd	Principle of operation of SOA		
	33rd	Types of SOA, EDFA		
12th	34th	Raman Amplifiers,	12th (3Hours)	**Revision**
	35th	Comparison of SOA,EDFA and Raman Amplifiers		
		Assignment No. 3, Sessionals Test - 3, Quiz		

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