Course Type	Course Code	Name of Course	L	T	P	Credit
DC	**NECC505**	Optical Fiber Communication	3	1	0	4

Course Objective
The objective of the course is to provide a thorough grounding in advance optical communications to address future needs of high data rate communications.
Learning Outcomes
At the end of the course, the student must be able to • Understand basic principles of light propagation and modal analyses of optical fiber. • Understand the basic operating principles of light sources, detectors. • Understand coherent detection, Noise, and Comparison of direct and coherent detection. • Design optical link, power penalty etc • Understand the basics of optical networks.

Module No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Overview of Optical fiber communication, Fiber- SMF, MMF, Ray theory and Mode theory of optical fibres,	09L+3T	Acquire an understanding of the modes and propagation characteristics of optical fibers
2	Attenuation and Dispersion in fibers; Special fibers.	06L+2T	Understand the principles of Attenuation and Dispersion in optical fiber.
3	Brief overview of optical transmitter and optical receiver. Receiver Noise processes, BER measurement, Noise measurement for optical communication system, Optical Losses.	06L+2T	Develop an understanding about performance of optical transmitters and receivers
4	Optical Amplifiers, Optical Filters.	03L+1T	Understand the working of optical amplifiers and filters
5	Coherent detection: fundamental concept, comparison of direct and coherent detection, Noise formulations, On-off keying, PSK, DPSK, FSK generation and detection.	09L+3T	Understand the concept of coherent detection and various keying mechanisms
6	Optical transmission Link design, Power budget and rise time budget. WDM Systems	06L+2T	Get an understanding of designing the complete transmission system and basics of WDM
7	Optical networks: network concept, optical switching, Passive optic networks and FTTx.	03L+1T	Obtain knowledge of future optical networks.
	Total	**42L+14T**	

Textbook:

1. Optical Fiber Communication-principles and practice, J. M. Senior (Prentice hall of India),2014

Reference Books:

1. Optical Fiber Communications, Gerd Keiser, TMH, 4th Edition, 2011
2. Optoelectronics and Photonics, O S Kasap, Pearson, 2013