



AMITY UNIVERSITY

UTTAR PRADESH

Annexure 'AAB-CD-01'

Course Title: Optical Communication Systems
Course Code: TELE611
Credit Units: 6
Level: PG

L	T	P/ S	SW/F W	TOTAL CREDIT UNITS
3	0	4	2	6

Course Objectives:

To give the detail knowledge of optical communication and trained the students to design and the realization of optical tele-communication systems.

Prerequisites:

Physics, Communication Systems.

Course Contents / Syllabus:		Weightage
4	Module I : Review of fiber optics	15%
	Descriptors/Topics : Overview of optical fiber communication system, acceptance angle and numerical aperture, step index fiber, GRIN fiber, single mode fiber, multimode fiber, types of single mode fiber: G-652, 653, 654, 655, optical fiber cable, attenuation and dispersion, optical fiber joining devices.	
5	Module II : Optical source and detectors	15%
	Descriptors/Topics : Optical sources: Basic concept of p-n junction, absorption,spontaneous & stimulated emission, types of optical sources- LED & LASER (working principle, characteristic, modulation & stability, radiation pattern & driver circuits). . OFDM, OCDMA, OTDMA	

	Optical detectors: Requirements of photo detectors, types of photo detectors, characteristics of photo detectors. principle of APD and PIN diodes, noise in photo detectors.	
6	Module III : Optical fiber communication systems	30%
	Descriptors/Topics : Components of an optical fiber communication systems, modulation formats, digital and analog optical communication systems. analysis and performance of optical receivers, power budget, rise time budget, system design for optical communication. SDH/SONET: Layers, framing, overhead, alarms, multiplexing, network element, topologies, protection architecture, network management.	
7	Module IV : DWDM system	25%
	Descriptors/Topics : DWDM: WDM, CWDM, DWDM, Evolution of WDM/DWDM system, operational principle of DWDM, DWDM components, role of DWDM in optical networking. PON, HFC, FTTH, FTTC, FTTB.	
8	Module V : Optical Amplifier	15%
	Descriptors/Topics : Optical Amplifier: basic applications and types of optical amplifier, semiconductor optical amplifier, erbium-doped fiber amplifier, amplifier noise, system applications: power amplifiers, in-line amplifiers, preamplifiers, multichannel operation.	

Student Learning Outcomes:

After completion of course, students will be able:

- To explain the suitability of optical fiber media with respect to other communication media.
- To identify the optical fiber for different applications.
- To explain the techniques to reduce the signal degradation in optical fiber.
- To identify the optical source and detector for different types of optical fiber and networks.
- To explain the joining techniques for optical fiber.
- To analyze the advanced optical communication link.

To design the different types of advanced optical communication systems

Pedagogy for Course Delivery:

Class Room Lecture, Tutorial, Group Discussion, Seminar and Lab Session.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total

67%	33%	100
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Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	Class Test	Home Assignment	Seminar/Viva	Attendance	
Weightage (%)	10%	10%	5%	5%	70%

Lab/ Practical/ Studio Assessment:

Continuous Assessment/Internal Assessment				End Term Examination		
Components (Drop down)	Performance	Viva	Attendance	Lab Records	Performance	Viva
Weightage (%)	15%	10%	5%	10%	40%	20%

Text & References:

- Ajoy Ghatak, K. Tyagrajan. Introduction to Fibres Optics
- John M. Senior, Optical Communications, (PHI).
- G. Kaiser, Optical fibre communication (McGraw Hill, Book Company, 1989).
- Vivek Alwayn, Optical Network Design and Implementation, (Pearson Education).