Course Code	ECE536s
Course Name	Optical Networking
Credits	2
Course Offered to	UG/PG
Course Description	To equip students with understanding of optical core networking systems. To study the architecture used in the networks and the different technologies used for optical core networks. Study the algorithms/schemes used for routing and wavelength assignment (RWA) and routing and spectrum allocation (RSA). Challenging issues in optical core networks.

Pre-requisites

Pre-requisite (Mandatory)	Pre-requisite (Desirable)	Pre-requiste (Other)
	Communication Networks	Programming skills
	Optical Communication Systems	
	Data Structures & Algorithms	

Post Conditions*(For suggestions on verbs please refer the second sheet)

CO1	CO2	CO3	CO4
The students can understand the design principles of optical networks and propose suitable schemes/approaches for different planning and operational problems.	The students can formulate optimization problems for routing and wavelength assignment (RWA) / routing and spectrum allocation (RSA) approaches.	The students can simulate their proposed schemes/approaches and validate the simulation results.	

Weekly Lecture Plan

Week Number	Lecture Topic	COs Met	Assignment/Labs/Tutorial
1	Introduction to optical networks	CO1	
2	Synchronous optical network (SONET)	CO1	
3	Wavelength-division multiplexing (WDM) optical networks and their limitations	CO1	
4	Wavelength routing network	CO1	
5	Routing	CO1,CO2,CO3	Programming Assignment 1
6	Wavelength assignment	CO1,CO2,CO3	
7	Virtual topology design	CO1,CO3	
8	Integer linear programming (ILP) formulation for routing and wavelength assignment (RWA)	CO1, CO2	Programming Assignment 2
9	Elastic optical networks (EONs)	CO1	
10	Spectrum allocation policies	CO1, CO2, CO3	
11	Different aspects related to routing and spectrum allocation (RSA)	CO1, CO2, CO3	
12	Fragmentation problem and defragmentation approaches	CO1, CO3	Programming Assignment 3
13	Challenging issues in EONs	CO1	

Assessment Plan

Type of Evaluation	% Contribution in Grade
Mid-sem	20
End-sem	30
Quiz	10
Assignment	10
Assignment	10
Assignment	10
Research paper presentation	10

*Please insert more row for other type of Evaluation

Resource Material	
Type	**Title**
Textbook	1. Biswanath Mukherjee, Optical WDM Networks, Springer, 2006 2. R.Ramaswami, K.Sivarajan, G. Sasaki, Optical Networks- A Practical Perspective, 3rd Ed., Elsevier Publication, 2009. 3. Siva Ram Murthy, Mohan Gurusamy, WDM Optical Networks: concepts, Design, and Algorithms, Prentice–Hall, 2002 4. Eiji Oki, Linear Programming and Algorithms for Communication Networks, Boca Raton, FL, USA: CRC Press, 2012 Pearson.
Reading Materials	Link to the research papers will be provided.