Course Type	Course Code	Name of Course	L	T	P	Credit
OE	CSO302	**Graph Theory**	3	0	0	9

Course Objective
To create interest, to familiarize the students with the important concepts, to develop their skills in the subject
Learning Outcomes
The students are expected to be able to deal with problems and challenges in the related fields both in academics and industries

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Basic graph theoretical concepts, definitions, representation, related theorems, different types of graphs	5	This introductory topics help students pick up the basic knowledge and concepts to start with the subject, to proceed with the more complex concepts
2	trees, spanning trees, Euler's theorem, vertex and edge connectivity, blocks,	5	students will pick up concepts about the special subgraphs with many applications in related problems
3	Hamiltonian and Euler graphs	5	the students will learn about special cycle and tours in graphs and will learn how to detect them if they exist in a graph
4	Matching, covering, related theorem, SDR, Edge coloring	7	Matching covering have extensive applications in problems that can be handled under the framework of graph theory and the students will learn them
5	Independent set, clique, Ramsey theorem, vertex coloring, critical graphs	5	These are related and extended concepts of topics in item 4 which the students will learn
6	Planar graphs, planarity testing, Directed graphs	4	planar graphs and related concepts are very important in various problems like VLSI and many others and the students will learn them
7	Strongly regular graphs, line graphs and eigen values, Laplacian of graphs, cuts and flows, rank polynomial	6	The students will pick up concepts to analyze graphs from a different perspective which is more inclined to algorithmic treatments
8	Random and infinite graphs, Applications in biology and social sciences	5	The students will learn the application parts of the graph theory

Text Books:

1. Graph theory with applications by J.A. Bondy and U.S.R. Murty, Elsevier
2. Algebraic graph theory by Chris Godsil and Gordon Royle, Springer

Reference Books:

1. Modern Graph Theory by Bela Bollobas, Springer
2. Introduction to Graph Theory by Douglas B West, PHI