

ELECTIVE –III -GRAPH THEORY

Semester	Subject Code	Category	Lecture		Theory		Practical	Credit
V		Elective –III	Hrs/Week	Hrs/Sem	Hrs/week	Hrs/Sem	0	3
			5	75	5	75		

COURSE OBJECTIVES:

The students will be able to

- Understand the fundamental concepts of graph theory such as paths, trees in a graph, Euler graphs and Hamiltonian graphs
- Apply the concepts of graph theory in relevant fields and to improve the proof writing skills.

COURSE OUTCOMES:

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	Understand the basic definitions and properties of graphs	K2
CO2	Find adjacency and incidence matrices	K3
CO3	Prove connectivity theorems	K3
CO4	Describe some basic algorithms for Eulerian graphs, Hamiltonian graphs and Planar graph.	K3
CO5	Develop mathematical models using graph theory	K3

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

MAPPING WITH PROGRAMME OUTCOMES:

Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	S	S
CO2	M	S	S	S	M	S
CO3	S	M	S	M	S	M
CO4	M	S	S	S	S	S
CO5	S	S	M	S	M	S

S- Strong; M- Medium; L- Low

Unit I : GRAPHS AND SUBGRAPHS

15

Hours

Graphs, Subgraphs, degree of a Vertex, isomorphism of graphs, walks, trails, paths.

(Chapter 2: Sections: 2.0 to 2.7

Chapter 4: Sections: 4.1)

Unit II: OPERATIONS ON GRAPHS

15 Hours

Adjacency and incidence matrices, Operations on graphs, Simple problems.

(Chapter 2: Sections: 2.8 to 2.9)

Unit III: CONNECTIVITY

15 Hours

Connectedness and components, cut vertex, bridge, block, connectivity theorems and simple problems.

(Chapter 4: Sections: 4.2 to 4.4)

Unit IV: EULERIAN GRAPHS, HAMILTONIAN GRAPHS AND TREES

15 Hours

Eulerian graphs and Hamiltonian graphs, trees, theorems and simple problems.

(Chapter 5: Sections: 5.0 to 5.2

Chapter 6: Sections: 6.0 to 6.2)

Unit V: PLANAR GRAPHS

15 Hours

Planar graphs – Definition and properties, colourability, chromatic number and chromatic index.

(Chapter 8: Sections: 8.0 to 8.3)

DISTRIBUTION OF MARKS: THEORY 80% AND PROBLEMS: 20%

TEXT BOOK

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	S. Arumugam and S. Ramachandran	Invitation to Graph Theory	Publications India Pvt Ltd, 7/3C, Madley Road, T - Nagar, Chennai – 17	2015

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	J.A Bondy and U.S.R Murthy	Graph theory and applications	McMillan	1976
2.	J.Clark and D.A	A first look at	Allied publishers	1995

	Holton	Graph theory		
3.	R.Gould	Graph theory	Benjamin / Cummings	1989
4.	A.Gibbons	Algorithmic Graph Theory	Cambridge University Press	1989
5.	R.J. Wilson	Introduction to Graph Theory	Pearson Education	2004
6.	S.A. Choudum	A First Course in Graph Theory	MacMillan India Ltd	1987

WEB RESOURCES

1. <https://iversity.org/blog/introduction-graph-theory/>
2. <http://www.hamilton.ie/ollie/Downloads/Graph.pdf>

TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
5. PPT Presentation