STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI
COURSE PLAN June - November 2024

Department : Mathematics

Name of the Faculty : Dr. S. Teresa Arockiamary

Course Title : Elements of Graph Theory
Course Code : 23MT/MC/EG34
Shift : 1

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	recall and list the basic concepts of graph theory	K1
CO2	summarize and outline the various graph theoretical terminologies	K2
CO3	identify and apply suitable methods to find solutions to problems related to graph theory	K3
CO4	analyse and examine the properties of various types of graphs through illustrative examples	K4
CO5	choose suitable graph theoretical concepts to estimate the various graphical parameters for any given graph	K5

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Jun 19 – 26, 2024 (Day Order 1 - 6)	1	**Basic Concepts of Graph theory** 1.1 Graphs-Vertices and Edges 1.2 Degrees	K1-K5	5	CO1-5	Lecture Group discussions	Questioning and interaction Group Work (working out exercise problems)
Jun 27 – July 4, 2024 (Day Order 1 - 6)	1	1.3 Subgraphs 1.4 Isomorphism 1.5 Matrices	K1-K5	5	CO1-5	Lecture Group discussions	Questioning and interaction **Unit 1** True and false questions Group Work
July 5 – 12, 2024 (Day Order 1 - 6)	1& 2	1.6 Operations on Graphs **Degree Sequences** 2.1 Degree Sequences 2.2 Graphic Sequences	K1-K5	5	CO1-5	Lecture Group discussions Problem solving	Slip test Assignment Problems in Unit 1
July 15 – 23, 2024 (Day Order 1 - 6)	2	2.2 Graphic Sequences **Connectedness** 2.3 Walks, Trails and Paths	K1-K5	5	CO1-5	Lecture Group discussions	Questioning and interaction Assignment Problems in Unit 2
July 24 – 31, 2024 (Day Order 1 - 6)	2	2.4 Connectedness and Components 2.5 Blocks	K1-K5	5	CO1-5	Lecture Presentations	Questioning and interaction **Unit 2** True and false questions

Aug 1 – 5, 2024 (Day Order 1 - 3)	2 & 3	2.5 Blocks **Eulerian and Hamiltonian Graphs** 3.1 Eulerian Graphs	K1-K5	3	CO1-5	Presentations Problem solving	Third Component I: Test (Unit 1& 2: Problems & few Theorems) Marks: 20
Aug 6 – 10, 2024		**C.A. Test – I (Units 1 & 2)**					
Aug 12 – 14, 2024 (Day Order 4-6)	3	3.1 Eulerian Graphs 3.2 Konigsberg Bridge Problem	K1-K5	2	CO1-5	Lecture Presentations	Questioning and interaction Group work
Aug 16 – 23, 2024 (Day Order 1-6)	3	3.2 Konigsberg Bridge Problem 3.3 Hamiltonian Graphs	K1-K5	5	CO1-5	Lecture Group discussions	Questioning and interaction Group work
Aug 27 – Sep 3, 2024 (Day Order 1-6)	3	3.3 Hamiltonian Graphs 3.4 Closure of a Graph	K1-K5	5	CO1-5	Lecture Presentations Problem solving	**Unit 3** True and false questions Group work
Sep 4 – 11, 2024 (Day Order 1-6)	4	**Trees** 4.1 Characterisation of Trees 4.2 Centre of a Tree	K1-K5	5	CO1-5	Presentations Group discussions	Questioning and interaction Group work

Sep 12 - 20, 2024 (Day Order 1-6)	4	4.2 Centre of a Tree **Planarity** 4.3 Definition and Properties	K1-K5	5	CO1-5	Presentations Group discussions Problem solving	Third Component II: Assignment submission (testing their understanding of Graph theory concepts learnt in Unit 3 & 4) Marks: 10 **Unit 4** True and false questions
Sep 23 - 26, 2024 (Day Order 1-4)	4 & 5	4.4 Characterization of Planar Graphs **Directed Graphs** 5.1 Directed Graphs	K1-K5	3	CO1-5	Presentations Group discussions	Questioning and interaction Group work
Sep 27 – Oct 3, 2024		**C.A. Test – II (Units 3 & 4)**
Oct 4 – 5, 2024 (Day 5 & 6)	5	5.1 Directed Graphs 5.2 Indegree and Outdegree	K1-K5	2	CO1-5	Presentations Group discussions	Group work
Oct 7 - 15, 2024 (Day Order 1 to 6)	5	5.3 Sequential Representation of Directed Graphs **Graph Algorithms** 5.4 Prim's Algorithm	K1-K5	5	CO1-5	Presentations Group discussions Problem solving	Third Component III: Quiz (Unit 5) Marks: 20
Oct 16 - 22, 2024 (Day Order 1 to 6)	5	5.5 Kruskal's Algorithm 5.6 Fleury's Algorithm	K1-K5	5	CO1-5	Presentations Group discussions	**Unit 5** True and false questions
Oct 23 - 24, 2024 (Day Order 1 to 2)		**REVISION**