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

Department : Mathematics
Name/s of the Faculty : Dr. V Jude Annie Cynthia
Course Title : Graph Theory
Course Code : 23MT/PC/GT14
Shift : 1

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	recall and define fundamental concepts of graphs and networks	K1
CO2	understand advanced concepts in graph theory	K2
CO3	apply graph theory concepts to solve real life problems	K3
CO4	analyze the topological properties of graphs	K4
CO5	determine and interpret parameters involved in graph problems	K5

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Jun 24 – 26, 2024 (Day Order 4 - 6)	1	**Graphs and Subgraphs** 1.1 Classification and properties of Graphs	K1- K5	3	CO1-5	Revision of Fundamentals, Group Discussions	Questioning
Jun 27 – July 4, 2024 (Day Order 1 - 6)	1	**Graphs and Subgraphs** 1.2 Shortest Path Problem 1.3 Dijkstras Algorithm	K1- K5	5	CO1-5	Interactive Lecture, Problem Solving	Questioning
July 5 – 12, 2024 (Day Order 1 - 6)	1	**Graphs and Subgraphs** 1.4 Trees 1.5 Cut Edges and Bonds	K1- K5	5	CO1-5	Lecture	Slip Test
July 15 – 23, 2024 (Day Order 1 - 6)	1	**Graphs and Subgraphs** 1.6 Cut Vertices 1.7 Directed graphs	K1- K5	5	CO1-5	Lecture, Group Discussion	**III Component 1**: Quiz – Part of Unit 1 (**15 marks**)
July 24 – 31, 2024 (Day Order 1 – 6)	2	**Connectivity, Matchings and Independent sets** 2.1 Connectivity 2.2 Matchings	K1- K5	5	CO1-5	Lecture	Seminar
Aug 1 – 5, 2024 (Day Order 1 – 3)	2	**Connectivity, Matchings and Independent sets** 2.3 Matchings and Coverings in Bipartite Graphs	K1- K5	2	CO1-5	Lecture, Revision	Questioning
Aug 6 – 10, 2024	**C.A. Test – I** (Unit 1 and part of Unit 2)						

Date	Unit	Topic	K-Level	Hours	CO	Mode of Teaching	Assessment
Aug 12 – 14, 2024 (Day Order 4-6)	2	**Connectivity, Matchings and Independent sets** 2.3 Matchings and Coverings in Bipartite Graphs 2.4 Independent Sets	K1- K5	3	CO1-5	Lecture	Problem Solving
Aug 16 – 23, 2024 (Day Order 1-6)	3	**Vertex Colorings and Edge Colorings** 3.1 Chromatic Number 3.2 Brooks' Theorem 3.3 Chromatic Polynomials	K1- K5	5	CO1-5	Lecture	**III Component 2**: Seminar- part of Unit 2 & Unit 3 (**20 marks**)
Aug 27 – Sep 3, 2024 (Day Order 1-6)	3	**Vertex Colourings and Edge Colorings** 3.4 Edge Chromatic Number 3.5 Vizing's Theorem	K1- K5	5	CO1-5	Lecture	Seminar
Sep 4 – 11, 2024 (Day Order 1-6)	3 / 4	**Vertex Colourings and Edge Colorings** 3.6 The Timetabling Problem **Planar Graphs and Domination Number** 4.1 Plane and Planar Graphs 4.2 Euler's Formula	K1- K5	5	CO1-5	Lecture	Seminar & Questioning
Sep 12 - 20, 2024 (Day Order 1-6)	4	**Planar Graphs and Domination Number** 4.3 Kuratowski's Theorem 4.4 Five-Colour Theorem 4.5 Dominating Sets	K1- K5	5	CO1-5	Lecture, Presentation	Seminar
Sep 23 - 26, 2024 (Day Order 1-4)	4	**Planar Graphs and Domination Number** 4.6 Minimal Domination Number 4.7 Independent Dominating Sets	K1- K5	3	CO1-5	Lecture, Revision	Seminar

Sep 27 – Oct 3, 2024	**C.A. Test – II** (Unit 3 and part of Unit 4)						
Oct 4 – 5, 2024 (Day 5 & 6)		**Interconnection Networks and Graphs, Well-known Topological Structures of Interconnection Networks** 5.1 Graphs and Interconnection Networks- Interconnection Networks, Adjacency Matrices and other Concepts, Trees and *k*-ary Trees, Embedding of Graphs, Diameter of Graphs 5.2 Basic Principles of Network Design	K1- K5	2	CO1-5	Presentation, Group Discussion	Questioning
Oct 7 - 15, 2024 (Day Order 1 to 6)		**Interconnection Networks and Graphs, Well-known Topological Structures of Interconnection Networks** 5.3 Cayley Method, Vertex-Transitive Graphs 5.4 Hypercube Networks 5.5 De Bruijn Networks	K1- K5	5	CO1-5	Lecture	**III Component 3**: Test – part of Unit 4 & 5 (**15 marks**)
Oct 16 - 22, 2024 (Day Order 1 to 6)		**Interconnection Networks and Graphs, Well-known Topological Structures of**	K1- K5	5	CO1-5	Lecture, Revision	Questioning

		Interconnection Networks 5.6 Kautz Networks 5.7 Circulant Networks					
Oct 23 - 24, 2024 (Day Order 1 to 2)	**REVISION**						