STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule: November 2024 – April 2025

Department : Mathematics

Name/s of the Faculty : Dr. Fancy V. F.

Course Title : Vector Spaces and Linear Transformations

Course Code : 19MT/MC/VL64

Shift : I

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov 18 – 25, 2024 (Day Order 1-6) 5 hours	**Preliminaries:** Revision of Fields **Unit 1: Vector Spaces** 1.1 General Vector Spaces and Subspaces 1.2 Linear Combinations	Lecture and Discussion	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	Questioning
Nov 26- Dec 3, 2024 (Day Order 1 to 6) 5 hours	**Unit 1 Vector Spaces** 1.3 Linear Dependence and Independence 1.4 Properties of Bases	Problem solving	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	Questioning

Dec 4-11, 2024 (Day Order 1 to 6) 5 hours	**Unit 1 Vector Spaces** 1.4 Properties of Bases **Unit 2 Vector Spaces (contd.)** 2.1 Rank	Problem solving	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	Questioning
Dec 12-19, 2024 (Day Order 1 to 6) 5 hours	**Unit 2 Vector Spaces (contd.)** 2.2 Orthonormal Vectors and Projections 2.3 Gram-Schmidt Orthogonalization Process	Derivation	Lang, Serge.*Modern Algebra***.** 7th ed. New York : Addison Wesley Publications, 1977	Open Book Test on problems
Dec 20, 2024 (Day Order 1) 1 hour	**Unit 2 Vector Spaces (contd.)** 2.4 Kernel, Range and the Rank-Nullity Theorem	Derivation	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	Questioning
Jan 3 – 7, 2025 (Day Order 3 to 6) 3 hours	**Unit 2 Vector Spaces (contd.)** 2.4 Kernel, Range and the Rank-Nullity Theorem	Problem solving	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd.,	Questioning
Jan 8 – 17, 2024 (Day Order 1 to 6) 5 hours	**Unit 3 Transformations** 3.1 Matrix Transformations, Rotations and Dilations	Seminar	Naik, K.V. *Modern Algebra***.** Chennai : Emerald Publishers, 1986	Questioning
Jan 18 - 23, 2025	**C.A. Test – I** (Portions: Units 1 & 2)			

Jan 24 - 30, 2025 (Day Order 1 to 6) 5 hours	**Unit 3 Transformations** 3.2 One-to-One Transformations and Inverse Transformations 3.3 Transformations and Systems of Linear Equations	Problem Solving	Narayanan, K.S, and T.K. Manicavachagom Pillai. *Modern Algebra Vol. II.* Chennai:Viswanathan, S. Printers and Publishers Pvt. Ltd., 1996	Questioning
Feb 3-8, 2025 (Day Order 1 to 6) 5 hours	**Unit 3 Transformations** 3.3 Transformations and Systems of Linear Equations (contd.), Problems	Lecture	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	Seminar
Feb 10– 18, 2025 (Day Order 1 to 4) 4 hours	**Unit 4 Coordinate Representations** 4.1 Coordinate Vectors 4.2 Change of Basis 4.3 Matrix Representations of Linear Transformations	Lecture	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	**Component 1:** Test in Problem Assignment (Unit 2 & 3, 25 marks)
Feb 19- 26, 2025 (Day Order 1-6) 5 hours	**Unit 4 Coordinate Representations** 4.4 Importance of Matrix Representation 4.5 Diagonalization of Matrices 4.6 Diagonalization of Symmetric Matrices - Orthogonal Diagonalization	Lecture	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	Questioning
Feb 27- Mar 6, 2025 (Day Order 1 to 6) 5 hours	**Unit 4 Coordinate Representations** 4.7 Diagonal Matrix Representation of a Linear Operator **Unit 5 Inner Product Spaces** 5.1 Inner Product	Lecture	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	**Component 2**: Assignment and Group Presentation on Applications of Linear Algebra (15 marks) Questioning

Mar 7 – 11, 2025 (Day Order 1 to 3) 3 hours	**Unit 5 Inner Product Spaces** 5.1 Inner Product 5.2 Norm of a Vector	Lecture	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	Questioning
Mar 12 –17, 2025	**C.A. Test – II** (Portions: Units 3 & 4)			
Mar 18 – 20, 2025 (Day 4 to 6) 2 hours	**Unit 5 Inner Product Spaces** 5.3 Orthogonal Vectors 5.4 Approximation of Functions and Coding Theory	Derivation	Sahai Vivek, and Vikas Bist. *Linear Algebra*. New Delhi : Narosa Publishing House, 2002	Problem solving
Mar 21 - 28, 2025 (Day Order 1 to 6) 5 hours	**Unit 5 Inner Product Spaces** 5.5 Least Squares Curves Problems	Problem Solving	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	**Component 3:** Quiz (10 marks) Portions: Units 4 and 5
Mar 29- April 3, 2025 (Day Order 1 to 3) 3 hours	**Unit 5 Inner Product Spaces** 5.5 Least Squares Curves Problems	Lecture	Williams Gareth. Linear Algebra with Applications. 6th ed. New Delhi: Narosa Publishing House Pvt. Ltd., 2008	Questioning
	REVISION			