STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI
COURSE PLAN (November 2024 – April 2025)

Department   : Mathematics

Name/s of the Faculty : Dr. S. Sarah Surya

Course Title   : Linear Algebra

Course Code   : 23MT/PC/LA24

Shift   : I

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	demonstrate the key concepts including canonical forms, characteristic values, inner product spaces and the operators on inner product spaces	K1
CO2	develop a deep comprehension of canonical forms in linear transformations, explaining their mathematical principles, significance in simplifying matrix representations and connections to the underlying vector space structure	K2
CO3	apply the concepts of canonical forms, characteristic values, invariant subspaces, inner product spaces and operators to solve a variety of theoretical and practical problems in linear algebra	K3
CO4	analyse the concepts of characteristic values, simultaneous triangulation & diagonalization, and normal operators, thereby assessing their interrelationships and implications in linear algebra	K4
CO5	demonstrating mastery of understanding, application, analysis and evaluation of the concepts introduced	K5

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Nov 18 – 25, 2024 (Day Order 1-6)	1	**Unit 1 Linear Transformations** 1.1 Canonical Forms: Triangular Forms	K1- K5	5	CO1-5	Lecture and problem solving	Questioning
Nov 26- Dec 3, 2024 (Day Order 1 to 6)	1	**Unit 1 Linear Transformations** 1.2 Canonical Forms: Nilpotent Transformations	K1- K5	5	CO1-5	Lecture and problem solving	Questioning
Dec 4-11, 2024 (Day Order 1 to 6)	1, 2	**Unit 1 Linear Transformations** 1.2 Canonical Forms: Nilpotent Transformations **Unit 2 More on Canonical Forms** 2.1 Canonical Forms: A Decomposition of V: Jordan Form	K1- K5	5	CO1-5	Lecture and problem solving	**Third Component – Problem solving (15 marks)**

Dec 12-19, 2024 (Day Order 1 to 6)	2	**Unit 2 More on Canonical Forms** 2.1 Canonical Forms: A Decomposition of *V*: Jordan Form	K1- K5	5	CO1-5	Problem solving	Questioning
Dec 20, 2024 (Day Order 1)	2	**Unit 2 More on Canonical Forms** 2.2 Canonical Forms: Rational Canonical Form	K1- K5	1	CO1-5	Lecture and Problem solving	Quiz
Jan 3 – 7, 2025 (Day Order 3 to 6)	2	**Unit 2 More on Canonical Forms** 2.2 Canonical Forms: Rational Canonical Form	K1- K5	3	CO1-5	Lecture and problem solving	Slip Test
Jan 8 – 17, 2024 (Day Order 1 to 6)	2, 3	**Unit 2 More on Canonical Forms** 2.2 Canonical Forms: Rational Canonical Form **Unit 3 Elementary Canonical Forms** 3.1 Characteristic Values 3.2 Annihilating Polynomials	K1- K5	5	CO1-5	Group discussion	Quiz

Jan 18 - 23, 2025	C.A. Test – I (Portions: Units 1 & 2)						
Jan 24 -31, 2025 (Day Order 1 to 6)	3	**Unit 3 Elementary Canonical Forms** 3.2 Annihilating Polynomials 3.3 Invariant Subspaces	K1- K5	5	CO1-5	Lecture and problem solving	Slip Test
Feb 3-8, 2025 (Day Order 1 to 6)	3	**Unit 3 Elementary Canonical Forms** 3.3 Invariant Subspaces 3.4 Simultaneous Triangulation; Simultaneous Diagonalization	K1- K5	5	CO1-5	Lecture and problem solving	**Third Component – Seminar (15 marks)**
Feb 10– 18, 2025 (Day Order 1 to 4)	3, 4	**Unit 3 Elementary Canonical Forms** 3.4 Simultaneous Diagonalization **Unit 4 Inner Product Spaces**	K1- K5	4	CO1-5	Presentation	Questioning

		4.1 Linear Functionals and Adjoints					
Feb 19- 26, 2025 (Day Order 1-6)	4	**Unit 4 Inner Product Spaces** 4.2 Unitary Operators	K1- K5	5	CO1-5	Lecture and problem solving	Questioning
Feb 27- Mar 6, 2025 (Day Order 1 to 6)	4	**Unit 4 Inner Product Spaces** 4.3 Normal Operators	K1- K5	5	CO1-5	Lecture and problem solving	**Third Component – Quiz (20 marks)**
Mar 7 – 11, 2025 (Day Order 1 to 3)	5	**Unit 5 Operators on Inner Product Spaces** 5.1 Forms on Inner Product Spaces	K1- K5	3	CO1-5	Lecture and problem solving	Questioning
Mar 12 –17, 2025	**C.A. Test – II (Portions: Units 3 & 4)**						
Mar 18 – 20, 2025 (Day 4 to 6)	5	**Unit 5 Operators on Inner Product Spaces** 5.2 Positive Forms	K1- K5	2	CO1-5	Lecture and problem solving	Slip Test
Mar 21 - 28, 2025	5	**Unit 5 Operators on**	K1- K5	5	CO1-5	Lecture and problem solving	Questioning

(Day Order 1 to 6)		**Inner Product Spaces** 5.2 Positive Forms 5.3 Applications of Inner Product Spaces					
Mar 29- April 2, 2025 (Day Order 1 to 3) (3 hrs)	**REVISION**						

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