

Curriculum Plan (EVEN SEM 2025): B. Sc. (H) Mathematics III Year (Semester VI)
Paper: DSC-Advanced Linear Algebra

<p align="center">Dr. Tajender Kumar</p> <p>Assistant Professor Department of Mathematics Kalindi College (University of Delhi) Delhi- 110008 Mobile: +91 7417837644 E- mail: tajenderkumar@kalindi.du.ac.in</p>		Marks Distribution	Theory	90 Marks
			Tutorial	40 Marks
			Internal Assessment	Assignments 12 Marks Home Exams/ 12 Marks Class Test
		Classes Assigned	Lectures	3 per week (Theory)
				Tut
		Attendance	6 Marks	
References	1. Friedberg, Stephen H., Insel, Arnold J., & Spence, Lawrence E. (2019). Linear Algebra (5th ed.). Pearson Education India Reprint.			
Beginning/1st week with 2 days 02 nd Jan. - 10 th Jan.	Topics The change of coordinate matrix; Dual spaces, Double dual, Dual basis, [1]: Chapter 2 (Sections 2.5, and 2.6).			
2nd week 12 th Jan. – 17 th Jan	Transpose of a linear transformation and its matrix in the dual basis, Annihilators. [1]: Chapter 2 (Sections 2.6).			

	3rd week 19 th Jan. – 24 th Jan.	Eigenvalues, Eigenvectors, Eigenspaces and characteristic polynomial of a linear operator; [1]: Chapter 5 (Sections 5.1)	
	4th week 26 th Jan. – 31 st Jan.	Diagonalizability, Direct sum of subspaces. [1]: Chapter 5 (Sections 5.2)	
	5th week 02 rd Feb.- 07 th Feb.	Invariant subspaces and the Cayley-Hamilton theorem; [1]: Chapter 5 (Section 5.4 up to Example 7 and corollary, p. 316).	
	6th week 09 th Feb. – 14 th Feb.	The Jordan canonical form and the minimal polynomial of a linear operator. [1]: Chapter 7 (Sections 7.1 [Definitions, and Examples only], and 7.3 with statement of Theorem 7.16)	
	7th week 16 th Feb. – 21 st Feb.	Inner products and norms, Orthonormal basis, [1]: Chapter 6 (Sections 6.1).	
	8th week 23 rd Feb. – 28 th Feb.	Gram-Schmidt orthogonalization process. [1]: Chapter 6 (Sections 6.2).	
	9th week 09 th Mar.– 14 th Mar.	Orthogonal complements, Bessel's inequality. [1]: Chapter 6 (Sections 6.2).	
	10th week	Adjoint of a linear operator with applications to least squares approximation and minimal	

	16 th March. – 21 st Mar.	solutions to systems of linear equations. [1]: Chapter 6 (Section 6.3 with statement of Theorem 6.13).	
	11th week 23 rd Mar. – 28 th Mar.	Normal and self-adjoint operators [1]: Chapter 6 (Section 6.4, and Section 6.5 up to Theorem 6.21).	
	12th week 30 th Mar. – 04 th Apr.	Unitary and orthogonal operators and their properties. [1]: Chapter 6 (Section 6.5 up to Theorem 6.21).	
	13th week 06 th Apr. – 11 th Apr.	Unitary and orthogonal operators and their properties. [1]: Chapter 6 (Section 6.5 up to Theorem 6.21).	
	14th week 13 th Apr. – 18 th Apr.	Orthogonal projections and the spectral theorem; [1]: Chapter 6 (Section 6.6 with outline of the proof of spectral theorem)	
	15th week with 3 Days 20 th Apr. – 29 th Apr.	Singular value decomposition for matrices. [1]: Chapter 6 (From the Section 6.7: Definitions of singular values, and singular value decomposition of a matrix, and statement of Theorem 6.27 with examples).	
Dispersal of classes, preparation leave and practical examination begin- 30 April, 2026.			