


**Curriculum Plan (Even Sem 2021-2022): Generic Elective Mathematics (Semester II)
GE-II Linear Algebra**

Mr. Hari Kishan Bhardwaj Assistant Professor Department of Mathematics Kalindi College University of Delhi Delhi- 110008 Mobile: +91-9868053327 E- mail harikishan@kalindi.du.ac.in		Marks Distribution	Theory	75 Marks
		Classes Assigned	Internal Assessment	25 Marks
			Lecture Tutorial	5 per week 1 Per week
References	1. Andrilli, S., & Hecker, D. (2016). Elementary Linear Algebra (5th ed.). Elsevier India. 2. Kolman, Bernard, & Hill, David R. (2001). Introductory Linear Algebra with Applications (7th ed.). Pearson Education, Delhi. First Indian Reprint 2003. Additional Reading: 3. Lay, David C., Lay, Steven R., & McDonald, Judi J. (2016). Linear Algebra and its Applications (5th ed.). Pearson Education.			
	Week	Topics		
	1st week Apr 7- 16, 2022	Fundamental operation with vectors in Euclidean space \mathbb{R}^n , Linear combination of vectors, dot product and their properties, Cauchy–Schwarz inequality, Triangle inequality, Projection vectors.		
	2nd week Apr 18- 23, 2022	Some elementary results on vectors in \mathbb{R}^n ; Matrices: Gauss–Jordan row reduction, Reduced row echelon form, Row equivalence, Rank.		
	3rd week Apr 25-30, 2022	Linear combination of vectors, Row space, Eigenvalues, Eigenvectors, Eigenspace, Characteristic polynomials, Diagonalization of matrices.		
	4th week May 2-7, 2022	Definition and examples of vector spaces, Some elementary properties of vector spaces.		
	5th week May 9-14, 2022	Subspace, Span, Spanning set for an eigenspace, Linear independence and dependence		

6th week May 16-21, 2022	Basis and dimension of a vector space, Maximal linearly independent sets, Minimal spanning sets.	
7th week May 23- 28, 2022	Application of rank: Homogenous and non-homogenous systems of linear equations; Coordinates of a vector in ordered basis, Transition matrix.	
8th week May 30- Jun 4, 2022	Linear transformations: Definition and examples, Elementary properties.	
9th week Jun 6- 11, 2022	The matrix of a linear transformation, Linear operator and similarity.	
10th week Jun 13-18, 2022	Application: Computer graphics, Fundamental movements in a plane, Homogenous coordinates, Composition of movements.	
11th week Jun 20-25, 2022	Kernel and range of a linear transformation, Statement of the dimension theorem and examples.	
12th week Jun 27-Jul 02, 2022	One to one and onto linear transformations, Invertible linear transformations, isomorphism, isomorphic vector spaces (to \mathbb{R}^n).	
13th week Jul 4-9, 2022	Orthogonal and orthonormal vectors, orthogonal and orthonormal bases, orthogonal complement	
14th week Jul 11-16, 2022	Statement of the projection theorem and examples. Orthogonal projection onto a subspace.	
15th week Jul 18- 23, 2022	Application: Least square solutions for inconsistent systems, non-unique least square solutions. + Revision	
16th week Jul 25- 27, 2022	Revision	

Dispersal of classes, preparation leave and practical examination begin July 28, 2022.