Name of the college: Government College of Arts , Science & Commerce, Sanquelim, Goa.						
Name of Faculty: Rohit R. Redkar	Subject: Linear Algebra					
Paper code: MAT-203	Program: S.Y.B.Sc.	Division:				
Academic year: 2024-25	Semester: IV	Total Lectures: 60				
Course Objectives: To display familiarity and knowledge of vector spaces, linear transformations and related concepts.						
<ul> <li>Expected Course Outcome: <ol> <li>Display familiarity and knowledge of the concepts in the syllabus.</li> <li>Demonstrate proofs to establish truths related to the concepts in the syllabus.</li> <li>Choose the appropriate procedures and modify them, if needed, to solve method-based problems on the concepts in the syllabus.</li> <li>Analyze and solve unseen problems in Linear Algebra and invent mathematically precise arguments to justify their solutions.</li> </ol></li></ul>						
Student Learning Outcome:						
1. Students will be able to analyse and solve problems in Li	near Algebra and invent mathematically prec	ise arguments to justify their solutions.				

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignme nt	ICT Tools	Reference books
December	Week 1 04/12/24	07/12/24	00	Nil			
December	Week 2 09/12/24	14/12/24	04	Vector spaces and Examples			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
December	Week 3 16/12/24	21/12/24	02 Liberation Day	Subspaces and Examples			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
January	Week 4 02/01/25	04/01/25	00	Nil			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
January	Week 5 06/01/25	11/01/25	04	Sum and Direct sum of two subspaces; Linear combinations; Span; Generating sets;			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
January	Week 6 13/01/25	18/01/25	04	Linear dependence and linear independence; Bases; Replacement theorem;			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
January	Week 7		04	Dimension; Dimension of (W1+W2); Quotient Space;	Assignme nt		S. Friedberg, A. Insel, L. Spence: Linear Algebra,

	20/01/25	25/01/25		Dimension of V/W.			4th Edition
January-February	Week 8 27/01/25	01/02/25	04	Linear transformation; Null space; Range of linear transformation; Nullity; Rank; Dimension theorem (Rank Nullity theorem);		Geogebra/ Sagemath	S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
February	Week 9 03/02/25	08/02/25	04	Ordered basis; Coordinate vector; Matrix representation of linear transformation; Space of linear transformations L(V,W);			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
February	Week 10 10/02/25	15/02/25	04	Composition of linear transformations; Left multiplication transformation; Inverse of a linear transformation; Isomorphism of vector spaces;			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
February	Week 11 17/02/25	22/02/25	04	Standard representation of a finite dimensional vector space. Change of coordinate matrix; Similar matrices.			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
February-March	Week 12 24/02/25	01/03/25	04	Diagonalizable linear operator; Eigen values and Eigen vectors;	Test	Geogebra/ Sagemath	S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
March	Week 13 03/03/25	08/03/25	04	Characteristic polynomial; Eigen spaces and Diagonalizability;			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
March	Week 14		04	Test for diagonalization			S. Friedberg, A. Insel, L.

	10/03/25	15/03/25	Holi				Spence: Linear Algebra, 4th Edition
March	Week 15 17/03/25	22/03/25	04	Diagonalization and direct sums. Inner product and examples.	Test		S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
March	Week 16 24/03/25	29/03/25	04	Norm of a vector; Orthogonal and orthonormal vectors;		Geogebra/ Sagemath	S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
March-April	Week 17 31/03/25	05/04/25	02 Gudi Padva, Id	Orthogonal Complement			S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition
April	Week 18 07/04/25	11/04/25	04	Gram-Schmidt Orthogonalization Process		Geogebra/ Sagemath	S. Friedberg, A. Insel, L. Spence: Linear Algebra, 4th Edition

## \* Assessment Rubrics

Component	Max Marks
ISA 1	10
ISA 2	10
Practical	Nil
Project	Nil
Semester End	
Exam	80