Lecture Plan

Name of the College: Government College of Arts, Science and Commerce, Sanquelim-Goa

Name of Faculty: Mr. Deepak G Bandiwadikar	**Subject:** Mathematics	
Paper code: MAT-211	**Program: S.Y.B.**Sc.	**Division: -**
Academic year: 2024-25	**Semester:** III	**Total Lectures: 45**

Course Objectives:
To introduce and familiarize the learner with the System of Equations, Matrices and Matrix Operations, Gauss Elimination method, Diagonalisation and Quadratic forms

Expected Course Outcome:

1) Display familiarity and knowledge of System of Equations, Matrices and matrix operations
2) Demonstrate proofs of Matrix Algebra
3) Choose the appropriate procedures and modify them, if needed to solve method-based problems on the concepts in the syllabus.
4) Analyze and solve unseen problems in Matrix Algebra and invent mathematically precise arguments to justify their solutions.

Student Learning Outcome: Student will be able to

1) Use matrices to represent and solve systems of linear equations.
2) Understand and determine the rank of a matrix, and use it to analyze and solve systems of linear equations.
3) Understand and determine the basis of a vector space and calculate its dimension

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
July	01/07/2024	06/07/2024	3	Vectors in R^n: Operations with vectors in R^3 and generalization to R^n	Problem solving	Chalk board	A textbook of matrices by Hari kishan
	08/07/2024	13/07/2024	3	Linear combinations; Linear dependence and independence;	Problem solving	Chalk board	A textbook of matrices by Hari kishan
	15/07/2024	20/07/2024	3	Basis and Dimension.	Problem solving	Chalk board	A textbook of matrices by Hari kishan
	22/07/2024	27/07/2024	3	Elementary operations on a matrix: Types of matrices, Special matrices	Problem solving	Chalk board	A textbook of matrices by Hari kishan
July August	29/07/2024	03/08/2024	3	Symmetric, Skew - Symmetric matrices, Conjugate of a matrix, Hermitian matrix, Nilpotent and Idempotent matrices;	Problem solving	Chalk board	A textbook of matrices by Hari kishan
August	05/08/2024	10/08/2024	3	Result and properties on Symmetric, Skew - Symmetric matrices,Conjugate of a matrix, Hermitian matrix, Nilpotent and Idempotent matrices;	Problem solving	Chalk board	A textbook of matrices by Hari kishan

	12/08/2024	17/08/2024	2	Elementary matrices; Effects of multiplying by these on a matrix; Equivalence of matrices: Row/column equivalence;	Problem solving	Chalk board	A textbook of matrices by Hari kishan
	19/08/2024	24/08/2024	3	Echelon forms; Normal form.	Problem solving	Chalk board	A textbook of matrices by Hari kishan
	26/08/2024	31/08/2024	3	Rank of a matrix: Definition using minors; Finding rank of a matrix using definition (upto 3x3 only);	Problem solving	Chalk board	A textbook of matrices by Hari kishan
September	02/09/2024	07/09/2024	3	Theorem: Elementary operations do not change the rank of a matrix; Finding the rank using echelon forms;	Problem solving	Chalk board	A textbook of matrices by Hari kishan
	08/09/2024	13/09/2024		Linear Independence of Row and Column Matrices; Definition of rank of a matrix using independence of Row or column vectors;			
	16/09/2024	21/09/2024	3	Equivalence of two definitions of Rank and examples on above two topics	Problem solving	Chalk board	A textbook of matrices by Hari kishan
	23/09/2024	28/09/2024	3	Application of matrices: Existence of solutions of a system of linear equations using Rank method and their solution using Gauss Elimination	Problem solving	Chalk board	A textbook of matrices by Hari kishan
September October	30/09/2024	05/10/2024	3	Gauss Jacobi and Gauss Siedel method;	Problem solving	Chalk board	A textbook of matrices by Hari kishan

October	07/10/2024	12/10/2024	3	Characteristic Values of a Matrix; Caley Hamilton Theorem; Diagonalisation of a matrix.	Problem solving	Chalk board	A textbook of matrices by Hari kishan
	14/10/2024	19/10/2024	3	Quadratic Forms: Quadratic form as a matrix product;	Problem solving	Chalk board	A textbook of matrices by Hari kishan
	21/10/2024	23/10/2024	2	Diagonal reduction of a symmetric matrix; Reduction of quadratic form into sum of squares form.	Problem solving	Chalk board	A textbook of matrices by Hari kishan

*** Assessment Rubrics**

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
Practical	25
SEE	60