Details of Course

Course Title	Course Structure			Pre-Requisite
MC 208 : Linear Algebra	L	T	P	Nil
	3	1	0	

Course Objective: The objective of this paper is to impart knowledge of vector space, linear transformation, bilinear form and Inner Product spaces.

Course Outcome (CO):

CO1	Explain computational techniques and algebraic skills essential for the study of systems of linear equations and matrix algebra.
CO2	Apply geometric properties and strategies to model and solve problems of vector spaces.
CO3	Compute and recognise the properties of special matrices.
CO4	Apply eigen vectors in obtaining canonical forms of matrices.
CO5	Describe inner product spaces, bilinear forms and positive definiteness of real quadratic forms.

S. No.	Contents	Contact hours
1.	Vector spaces, Properties of vector spaces, Subspaces, Linear dependence and independence, Linear span, Bases and Dimension, Linear Sum, Direct Sum, Quotient Spaces.	8
2.	Linear transformations, Range and Null spaces, Rank–Nullity theorem and its application, Inverse linear transformation, Representation of linear transformations by matrices, Change of basis, Dual space, Dual bases .	10
3.	Transpose of a linear transformation, Eigen values and Eigen vectors, Cayley–Hamilton Theorem, Diagonalization, Minimal polynomials, Jordan canonical form.	8
4.	Inner product spaces, norm of a vector, orthogonality, orthonormal set, orthonormal basis, Gram-Schmidt orthonormalization, orthogonal projections, Linear functional and adjoints, Hermitian, self-adjoint.	8
5.	Unitary and normal operators, Bilinear forms, Symmetric and skew-symmetric bilinear forms, Real quadratic forms, Positive definiteness	8
	Total	42

Suggested Books:

S. No.	Name of Books/Authors/Publishers	Year of Publication
1	K. Hoffmann and R. Kunze, Linear Algebra, 2nd Edition , Pearson	2015
2	G. Hadley, Linear Algebra, Narosa publication	2002
3	Gilbert Strang, Linear Algebra and its applications, Cengage Learning, 4th edition	2007
4	Serge Lang, Introduction to Linear Algebra, Springer	2004
5	Linear Algebra, Fourth edition, Schaum's outlines	2015