1.	Title of the course	Linear Algebra
2.	Course number	MA506L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To MA5109/7
6.	To be offered by	Department of Mathematics and Statistics
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To introduce the notions of abstract vector spaces and linear transformations and properties of inner product spaces. Using these notions to study some of the important results in linear algebra like Rank-Nullity theorem, Diagonalization, Primary decomposition Gram-Schmidt orthonormilization process.	
10.	**Course Content:** Systems of Linear Equations, Matrices and Elementary Row Operations, Row-Reduced Echelon Matrices. Vector Spaces, Subspaces, Bases and Dimension, Ordered basis and coordinates. Linear transformations, Rank-Nullity Theorem, The algebra of linear transformations, Isomorphism, Matrix representation of linear transformations, Linear Functionals, Annihilator, Double dual, Transpose of a linear transformation. Characteristic Values and Characteristic Vectors of linear transformations, Diagonalizability, Positive definite matrices, Minimal polynomial of a linear transformation, Cayley-Hamilton Theorem, Invariant Subspaces, Direct-sum decompositions, Invariant Direct sums, The primary decomposition theorem, Cyclic subspaces and annihilators, Cyclic decomposition, Rational and Jordan forms. Inner Product Spaces, Orthonormal Basis, Gram-Schmidt Theorem.	
11.	**Textbook(s):** 1. Gilbert Strang, *Introduction to Linear Algebra*, Wellesley-Cambridge Press (2009). 2. Hoffman K, Kunze R, Linear Algebra, Prentice Hall of India, (2015).	
12.	**Reference(s):** 1. Herstein I N, Topics in Algebra, Wiley, (2006). 2. Axler S, Linear Algebra Done Right, Springer, (2004). 3. Lang S, Linear Algebra, Springer, (2004). 4. Kumaresan S, Linear Algebra: A Geometric Approach, Prentice Hall India, (2009). 5. Artin M, Algebra, Pearson Education India, (2010).	