Department of Mathematics
Faculty of Mathematics & Computer Science
M.Sc. (Applied Mathematics), 1st Semester

Course Code	AM 101
Course Title	Linear Algebra
Course Credits	04

Course objectives:

Minimum pre-requisites:

Course structure:

Basics of Vector Spaces. Vector space, subspace, linear combination, linear dependence and independence, bases and dimensions.

Linear Transformations and Matrices. Linear transformation, Null space, range, rank, algebra of linear transformations, matrix representation of a linear transformation, isomorphism, dual space.

Diagonalization. Eigenvalues, eigenvectors, eigenspace, matrix limits, Markov chains.

Inner Product Spaces. Inner product space, norm, Gram-Schmidt orthogonalization process, adjoint of a linear operator, self-adjoint, normal and unitary operators along with their matrix representations, orthogonal projection, spectral theorem, bilinear, quadratic and Hermitian forms, Jordan forms.

Reading suggestions:

- **S.H. Friedberg, A.J. Insel and L.E. Spence,** *Linear Algebra*, PHI learning Pvt Ltd, 4th Edition.
- **I.N. Herstein**, *Topics in AlgebraJohn Wiley & Sons, 2006.*
- **S. Lipschutz and M. Lipson,** *Linear Algebra,* Schaum's Outline Series, Tata Mcgraw Hill Education Pvt Ltd,3rd Edition, 2001.
- **M. Artin,** *Algebra,* PHI learning Pvt Ltd, 2nd Edition, 2011.

Evaluation and Weightage: