MA 106 Linear Algebra 3104

- Vectors in R^n , notion of linear independence and dependence, linear span of a set of vectors, vector subspaces of R^n , basis of a vector subspace
- Systems of linear equations, matrices and Gauss elimination, row space, null space, and column space, rank of a matrix.
- Determinants and rank of a matrix in terms of determinants.
- Abstract vector spaces, linear transformations, matrix of a linear transformation, change of basis and similarity, rank-nullity theorem.
- Inner product spaces, Gram-Schmidt process, orthonormal bases, projections and least squares approximation.
- Eigenvalues and eigenvectors, characteristic polynomials, eigenvalues of special matrices (orthogonal, unitary, hermitian, symmetric, skew-symmetric, normal). algebraic and geometric multiplicity, diagonalization by similarity transformations, spectral theorem for real symmetric matrices, application to quadratic forms.

Texts/References

1. H. Anton, Elementary linear algebra with applications (8th Edition), John Wiley (1995).
2. G. Strang, Linear algebra and its applications (4th Edition), Thomson(2006).
3. S. Kumaresan, Linear algebra - A Geometric approach, Prentice Hall of India (2000).
4. E. Kreyszig, Advanced engineering mathematics (8th Edition), John