

PROPOSED SYLLABUS (2014 ADMISSION)

MAM 2101 LINEAR ALGEBRA

Unit 1 – Review of System of Linear Equations.

Vector Spaces, Subspaces, Bases and dimension, Coordinates, Summary of Row -Equivalence. (Chapter 1 and Chapter 2, sections 2.1-2.5)

Unit 2 – Linear Transformations, The Algebra of Linear Transformations, Isomorphism, Representation of Transformations by Matrices, Linear Functionals, The Double Dual, The Transpose of a Linear Transformation. (Chapter3)

Unit 3- Determinants- Commutative Rings, Determinant Functions, Permutations and the Uniqueness of Determinants, Additional Properties of Determinants.

Elementary Canonical Forms – Introduction, Characteristic Values, Annihilating Polynomials, Invariant Subspaces.(Chapter 5, sections 5.1- 5.4,Chapter 6,sections 6.1 -6.4)

Unit 4 - Simultaneous Triangulation; Simultaneous Diagonalization, Direct-Sum Decompositions.

The Rational and Jordan Forms – Cyclic Subspaces and Annihilators, Cyclic Decompositions and the Rational Form, The Jordan Form. (Chapter 6, sections 6.5&6.6 and Chapter 7, sections 7.1- 7.3)

Unit 5- Inner Product Spaces- Inner Products, Inner Product Spaces, Linear Functionals and Adjoints, Unitary Operators, Normal Operators, Bilinear Forms, Symmetric bilinear forms, Skew-Symmetric bilinear forms.

(Chapter 8 and Chapter 10, sections 10.1- 10.3)

TEXT BOOK

Kenneth Hoffman and Ray Kunze, Linear Algebra, Prentice-Hall of India, Second Edition (1975).

REFERENCES

1. M.Artin, Algebra, Prentice-Hall, 1991.
2. Serge Lang, Introduction to Linear Algebra, Springer,2nd edition, 1997.
3. K.T.Leung, Linear Algebra and Geometry, Hong Kong University Press, 1974.
4. S.Kumaresan, Linear Algebra: A Geometric Approach, 1st Edition PHI Learning (2009).
5. Sheldon Axler, Linear Algebra Done Right, 2nd Edition, Springer, 1997.

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