Comprehensive Exam
Component - MATH 550 Linear Algebra

BOOK

Linear Algebra, by K. Hoffman – R. Kunze, Second Edition. (*Available for free download on the web*.)

SYLLABUS

Sections	Topics
1.1, 2.1, 2.2 2.3	Fields, VECTOR SPACES. Subspaces (Review) Bases and Dimension
2.4 3.1	Coordinates LINEAR TRANSFORMATIONS.
3.2-3.3 3.4	The Algebra of Linear Transformations, Isomorphisms Representation of Transformations by Matrices
3.5 3.6-3.7	Linear Functionals The Double Dual, The Transpose of a Linear Transformation
6.1-6.2 6.3	ELEMENTARY CANONICAL FORMS. Characteristic Values Annihilating Polynomials
6.4 6.5-6.6	Invariant Subspaces Simultaneous Triangulation/Diagonalization, Direct-Sum Decomposition
6.7-6.8	Invariant Direct Sums, The Primary Decomposition Theorem
7.1-7.2	THE RATIONAL AND JORDAN FORMS. Cyclic Subspaces and Annihilators, Cyclic Decompositions and the Rational Form
7.3 7.4	The Jordan Form Computation of Invariant Factors
7.5	Summary, Semi-simple Operators
8.1-8.2	INNER PRODUCT SPACES. Inner Products, Inner Product Spaces
8.3 8.4	Linear Functionals and Adjoints Unitary Operators
8.5 9.5	Normal Operators Spectral Theory
10.1 10.2	BILINEAR FORMS Symmetric Bilinear Forms
10.3	Skew-Symmetric Bilinear Forms