

Know the meaning of, be able to calculate, and prove simple theorems about the following:

Null Space and Column Space

Eigenvectors and eigenvalues

Diagonalization and Similarity

Geometric interpretation of matrices with complex eigenvalues

Determinants – how to calculate them and properties

Orthogonality

Orthogonal projections

Orthogonal and orthonormal basis

Orthogonal matrix – definition and properties

Constructing an orthogonal basis – Gram Schmidt

Orthogonal complement

Orthogonal decomposition theorem

Vector Spaces and Inner Product Spaces

Know the axioms

Express a linear combination of functions as coordinate vectors with respect to some basis.

Find the matrix corresponding to a linear transformation

Know the definition of Norm, Orthogonal, and Distance

Applications

Difference Equations

Method of Least Squares

Markov Chains

Applications of Linear Transformations

Applications of determinants

Note: I will not be asking you to prove theorems directly out of the book, but I may ask you to prove some simple results that might follow from theorems in the book.