

Linear Algebra

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Part I

Chapter 1

Vector spaces

subspaces examples linear independence basis and dimension coordinates direct sum

Chapter 2

Linear transformations

matrices matrix operations coordinate change column and null spaces LU decomposition

Chapter 3

Square matrices

inverse matrix determinant and trace two by two matrices

Part II

Chapter 4

Eigenvalues

characteristic polynomials minimal polynomials eigenspaces spectral mapping theorem real and complex vector spaces

Chapter 5

Normal forms

multiplicity Jordan normal form canonical normal form cyclic decomposition

Chapter 6

Similarity

isomorphism for $F[x]$ -modules conjugacy classes commuting matrices simultaneous diagonalization

Part III

Part IV