

Week	Contents/Topics	Tools	Exercises/Questions
1	Introduction, System of Linear equations, Elementary row operation		1.1 (1-20)
2	Solving system of Linear equations: Gaussian Elimination and Gauss Jordan methods Matrix Operations Elementary Matrices, Methods for finding Inverse	A1	1.2 (1-26) 1.3 (1-20) 1.5 (1-6, 11-18)
3	Invertible Matrices, Diagonal, triangular, and symmetric matrices, Introduction to linear Transformations		1.6 (1-20) 1.7 (1-10, 19-28) 1.8 (1-24, 27-41)
4	Application of linear systems <ul style="list-style-type: none"> • Network Analysis • Electrical circuits • Polynomial interpolation 	Q1	1.10 (1-8, 13-16)
5	Determinants by Cofactors expansion Determinants by row reduction, Properties of Determinants and Cramer's Rule		2.1 (1-32) 2.2 (1-23) 2.3 (1-29, 31, 35)
6	Mid 1-Exam		
7	Real Vector Space, Spanning Sets, Linear Independence,	A2	4.1 (1-14) 4.3 (1-20) 4.4 (1-21)
8	Coordinates and Bases, Dimensions		4.5 (1-28) 4.6 (1-20)
9	Bases for row, column, and null spaces, Rank and Nullity	Q2	4.8 (1-31) 4.9 (1-38)
10	Eigen values and Eigenvectors, Diagonalization	A3	5.1 (1-16) 5.2 (1-20)
11	Mid 2 -Exam		
12	Inner products, Angle and Orthogonality in inner product spaces		6.1 (1-26) 6.2 (1-12, 17-19)
13	Gram-Schmidt Process, QR-Decomposition.	Q3 A4	6.3 (1-14, 27-31) (44-49)
14	Orthogonal Matrices Orthogonal Diagonalization,		7.1 (1-6) 7.2 (1-18)
15	Quadratic Forms Hermitian, Unitary and Normal Matrices LU decomposition (linear equation)	Q4	7.3 (1-8, 17-28) 7.5 (1-18) 9.1 (1-9)
16	Revision / Final exam		