National University of Computer & Emerging Sciences
MT-1004 Linear Algebra
Fall 2023

Course Content for Final Exam

Contents/Topics	Exercises
System of Linear Equations and Matrices: Invertible Matrices, Introduction to linear Transformations	**1.6** (1-20) **1.8** (1-24, 27-41)
Application of linear systems • Network Analysis • Polynomial interpolation	**1.10** (1-8,13-16)
General Vector Spaces: Real Vector Space, Spanning Sets, Linear Independence,	**4.1** (1-14) **4.3** (1-13,17,18) **4.4**(1-14)
Coordinates and Bases, Dimensions	**4.5**(1-22) **4.6** (Q1-8,12,13,18-20)
Bases for row, column, and null spaces, Rank and Nullity	**4.8** (Q1-15,18,19, 25-28) **4.9** (Q1-14,19-23)
Eigenvalues and Eigenvectors: Eigen values and Eigenvectors, Diagonalization	**5.1** (1-16) **5.2** (1-20)
MID-II	
Inner Product Space: Inner products , Angle and Orthogonality in inner product spaces	**6.1** (1-26) **6.2** (1-12, 17-19)
Gram-Schmidt Process, QR-Decomposition.	**6.3** (1-14, 27-31), (44-49)
Diagonalization and Quadratic Forms: Orthogonal Matrices Orthogonal Diagonalization. Spectral Decomposition	**7.1** (1-6) **7.2** (1-18)
Quadratic Forms	**7.3** (1-8 ,17-28)