

Weekly Subjects and Related Preparation Studies

Week	Subjects	Related Preparation
1	Definition of matrix, types of matrix, Equality of Matrices, Addition and subtraction of matrices, matrix multiplication by a scalar, Some properties about them. Multiplying matrices and Some properties about it. Transposes of matrices and properties of the transpose.	Textbook (Chapter 1)
2	Some Special Matrices and matrix applications.(Symmetric Matrix,Anti symmetric matrix, periodic matrix, idempotent matrix, Nilpotent matrix, orthogonal matrix, A conjugate of a matrix and its properties, hermitian matrix,Anti hermitian matrix, regular matrix, singular matrix, and their applications.	Textbook (Chapter 1)
3	Elementary row and column operations in the Matrices. Row-Echelon form and reduced row-echelon form. Rank of a matrix. Inverses of matrices and some applications about this.	Textbook (Chapter 1)
4	Definition of a determinant. Laplace expansion of a matrix. Properties of a determinant.	Textbook (Chapter 2)
5	Rule of Sarrus. The adjoint of a matrix, Using the adjoint matrix to find an inverse matrix and some applications about this.	Textbook (Chapter 2)
6	System of linear equations: solving systems of linear equations with aid of equivalent matrices, linear homogeneous equations and some applications about this.	Textbook (Chapter 3)
7	Cramer's rule. Using the inverse of a coefficient matrix to solve a linear systems and some applications about this.	Textbook (Chapter 3)
8	Midterm 1	
9	Vectors: Definition of Vectors,The sum of vectors and Subtraction of vectors and Multiplication of vectors, Dot product of two vectors and their properties, Vector product of two vectors(Cross product of vectors) and their properties, Mixed product of three vectors(Triple product) and their properties, Double vector product(double cross) and their properties and some applications about this.	Textbook (Chapter 4)
10	Vector Spaces: Definition of vector spaces and theorems. Subspaces and their applications.	Textbook, (Chapter 5)

11	Span concept and fundamental theorems. Linear dependence and linear independence of vectors and some theorems about linear dependence and linear independence. Some applications about this.	Textbook (Chapter 5)
12	Quiz, Bases and dimension concepts and fundamental theorems. Some applications about this.	Textbook (Chapter 5)
13	Definition of coordinates and transition matrices and some theorems. Some applications about this.	Textbook (Chapter 5)
14	Eigenvalues and eigenvectors: The eigenvalues of a square matrix. Cayley Hamilton Theorem and their applications.	Textbook (Chapter 6)
15	Final	