National University of Computer & Emerging Sciences

MT104-LINEAR ALGEBRA

Credit Hours: 3

Semester: Fall 2019

Course Instructor: Mr. Osama Sohrab

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Prerequisite: None

Office No: 34

Objective:

The objective is to impart training to the students in this very important branch of Mathematics. Students are expected to learn about system of linear equations, vector spaces, inner products, eigenvalues and linear transformations. Attempt will be made to introduce students to postulational and axiomatic approach in mathematics.

Recommended Book:

Elementary Linear Algebra Application Version by Howard Anton & Chris Rorres (10th Edition)

Reference Book:

Elementary Linear Algebra by Ron Larson (8th Edition)

Outlines:

Matrices & System of Linear Equations

Matrices, determinants, inverses, invertible, diagonal, triangular, and symmetric matrices, system of linear equations, Gaussian elimination, results on system of equations.

General Vector Spaces

Real Vector Spaces, Subspaces, Linear Independence, Basis and Dimensions. Row Space, Column Space and Null Space, Rank and Nullity.

Inner Product Spaces

Inner Products, Angles and Orthogonality in Inner Product Spaces, Orthogonal Bases: Gram Schmidt Process, QR-decomposition, Best Approximation, Least Squares, Orthogonal Matrices, Change of Basis.

Eigenvalues, Eigenvectors

Eigen values and Eigen vectors Diagonalization, Orthogonal Diagonalization.

Linear Transformations

General Linear Transformation, Kernel and Range, Inverse Linear Transformation, Similarity.

Marks Distribution:

Exams	Marks
Final	**50**
Sessional-I	**15**
Sessional-II	**15**
Quizzes	**5*2=10**
Assignments	**5*2=10**
Total	**100**