Jordan University of Science and Technology

Faculty of Science & Arts

Mathematics Department

MATH340 Linear Algebra (1)

First Semester 2022-2023

Course Catalog
3 Credit Hours. In this course, we mainly study the following subjects: Inner Products Space, Gram-Schmidt Process, QR-Decomposition, Eigenvalues and Eigenvectors, Orthogonal Diagonalization, General Linear Transformation, Similarity, Complex Inner Spaces, Unitary, Normal, and Hermitian Matrices.

Text Book	
Title	Elementary Linear Algebra
Author(s)	H. Anton and C. Rorres
Edition	9th Edition
Short Name	TextBook
Other Information	2007. John Wiley & Sons Inc.

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref 1	Applied Linear Algebra	B. Noble and J.W. Daniel	3rd Edition	1998, Prentice Hall.
Ref 2	Linear Algebra with applications	G.Nakos and D. Joyner	1st Edition	1998, Brooks/Cole.

Instructor	
Name	**Dr. IMAD JARADAT**
Office Location	D1 Level 0
Office Hours	Sun : 10:30 - 11:30 Mon : 13:00 - 14:00 Tue : 10:30 - 11:30 Wed : 11:30 - 13:30 Thu : 10:30 - 11:30
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Class Schedule & Room
Section 1: Lecture Time: Mon : 11:30 - 13:00 Room: SF07

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
902450	MATH245 Set Theory And Logic	Prerequisite / Pass
901400	MATH140 Elements Of Linear Algebra	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2, 3, 4, 5	Inner Products, Angle and Orthogonality, Orthonormal Bases, Best Approximations, Change of Basis, Orthogonal Matrices	**Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.6** From **TextBook**
Weeks 6, 7	Eigenvalues and Eigenvectors, Diagonalization, Orthogonal Diagonalization	**Sections 7.1, 7.2, 7.3** From **TextBook**
Weeks 8, 9, 10	General Linear Transformation, Kernel and Range, Inverse Linear Transformation, Matrices of General Linear Transformation, Similarity, Isomorphism	**Sections 8.1, 8.2, 8.3, 8.4, 8.5, 8.6** From **TextBook**
Weeks 11, 12	Quadratic Forms, LU-Decomposition	**Sections 9.5, 9.9** From **TextBook**
Weeks 13, 14, 15	Complex Vector Spaces, Complex Inner Product Spaces, Unitary, Normal, and Hermitian Matrices	**Sections 10.4, 10.5, 10.6** From **TextBook**
Week 16	Final Exam Week	

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Extend the concept of Euclidean inner product over real and complex fields to a generalized inner product. [1SLO1]	30%	
Learn and apply the Gram-Schmidt process for producing orthonormal bases. [1SLO1]	12%	
Define and study linear transformations between arbitrary vector spaces and their properties. [1SLO1]	30%	
Learn and apply the algorithm for obtaining the LU-decomposition and QR- decomposition of a matrix. [1SLO1]	12%	
Define and study the unitary, normal, and Hermitian matrices. [1SLO1]	16%	

Relationship to Program Student Outcomes (Out of 100%)					
SLO1	SLO2	SLO3	SLO4	SLO5	SLO6
100					

Evaluation	
Assessment Tool	**Weight**
First Exam	30%
Second Exam	30%
Final Exam	40%

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