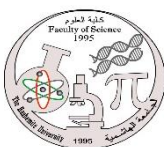



<b>Hashemite University</b>	 	Linear Algebra (1) (110101241) <b>3 Credit Hours</b>
<b>Faculty of Science</b>		<b>Pre-requisite: None</b>
<b>Department of Mathematics</b>		<b>Summer Summer 2021/2022</b>
<b>Course Syllabus</b>		

<b>Course Information</b>	
Lecture's Time	
Lecture's Room	
Instructor	Dr. Abdallah Shihadeh
Office Location	مبنى الرياضيات 123
Office Hours	
<b>Text Book : Elementary Linear Algebra with Applications, by Howard Anton edition: 9<sup>th</sup> or 11<sup>th</sup></b>	
<b>References(s)</b>	(1) Linear Algebra, an Introduction, <i>Richard Bronson</i> (2) Linear Algebra, <i>S. Lang</i> (3) Applied Linear Algebra, <i>B. Noble, J.W. Daniel.</i>

#### Grading Policy:

##### Theory

First Exam	30%
Second Exam	30%
Final Exam	40%

<b>Course Objectives</b>
To present the fundamentals of linear algebra. To become familiar with the basic concepts of matrix algebra, vector spaces linear transformations, determinants, eigenvalues and eigenvectors, diagonalization, orthogonality, and projections.
<b>Teaching and Learning Methods</b>
<ol style="list-style-type: none"> <li>1. Introducing new definitions and using examples to illustrate new concepts.</li> <li>2. Proving the theorems which constitute the core of the course.</li> <li>3. Solving some examples and assigning homework's.</li> <li>4. Discussing some of the students' solutions of some sample assignment.</li> <li>5. Making a discussion of the problems of each exam.</li> </ol>

Chapter	Section	Topic	Week
I		<b>Systems of Linear Equations and Matrices</b>	
	1.1	Introduction to System of Linear Equations	
	1.2	Gaussian Elimination	
	1.3	Matrices and Matrix Operations	
	1.4	Inverses, Rules of Matrix Arithmetic	
	1.5	Elementary Matrices and a method for finding $A^{-1}$	
	1.6	Further results on Systems of Equations and Invertibility	
	1.7	Diagonal, Triangular, and Symmetric Matrices	
II		<b>Determinants</b>	
	2.1	The Determinant Function	
	2.2	Evaluation Determinants by Row Reduction	
	2.3	Properties of Determinant Function	
	2.4	Cofactor Expansion; Cramer's Rule	
V		<b>General Vector Spaces</b>	
	5.1	Real Vector Spaces	
	5.2	Subspaces	
	5.3	Linear Independence	
	5.4	Basis and Dimension	
	5.5	Row space, Column space, and Null space	
	5.6	Rank and Nullity	
VI		<b>Inner Product Spaces</b>	
	6.1	Inner Products	
	6.2	Angle and Orthogonality in inner product spaces	
	6.3	Orthogonal Bases; Gram-Schmidt Process	
	6.5	Orthogonal Matrices; Change of Basis	
VII		<b>Eigenvalues; Eigenvectors</b>	
	7.1	Eigenvalues and Eigenvectors	
	7.2	Diagonalization	
	7.3	Orthogonal Diagonalizations	
VIII		<b>Linear Transformations</b>	
	8.1	General Linear Transformations	
	8.2	Kernel and Range	
	8.3	Inverse Linear Transformations	
	8.4	Matrices of general Linear Transformations	
	8.5	Similarity	

**Attendance is absolutely mandatory. Students who miss a 15% class sessions without a compelling excuse will qualifies the student to be dismissal.**