

Chapter Title	Section Title	Subtitle	Examples	HW
Chapter 1 Systems of Linear Equations	1.1 Introduction to Systems of Linear Equations	Linear Equations in $n$ Variables, Systems of Linear Equations, Solving a System of Linear Equations	1-5 Exc. 1-6	16 ,69 ,70
	1.2 Gaussian Elimination and Gauss-Jordan Elimination.	Elementary Row Operations, Gauss –Jordan Elimination, Homogeneous Systems of Linear Equations	1-9	4, 7, 20,21 27, 44, 47, 48,49,57, 61, 62
Chapter 2 Matrices	2.1 Operations with Matrices	Matrix Addition, Scalar Multiplication , Matrix Multiplication, Systems of Linear Equations	1-6	1-3, 7-10, 12-15,21-28,37, 38, 40,41,44,49 51-53.
	2.2 Properties of Matrix Operations	Properties of Matrix Multiplication, The Transpose of a Matrix	1-10	1, 5, 7, 13,14, 16,17,19-22, 29,30,32,39,55,57- 59,61,65.
	2.3 The Inverse of a Matrix	Properties of Inverses, Systems of Equations	1, 3-8 Exc.48	2, 4, 5,9,25-27, 33,38, 39,41, 42,49,52,56- 58
Chapter 3 Determinants	3.1 The Determinant of a Matrix	Triangular Matrices	1-4, 6	13,15,19,33, 41-45, 49,51-54, 67-72,74

<b>Continued Chapter 3 Determinants</b>	<b>3.2 Evaluation of a Determinant Using Elementary Operations.</b>	<b>Determinants and Elementary Column Operations</b>	<b>2-6</b>	<b>15-20, 31-33, 48</b>
	<b>3.3 Properties of Determinants</b>	<b>Determinants and the Inverse of a Matrix, Determinants and the Transpose of a Matrix</b>	<b>1-6</b>	<b>3,4, 7-9, 12, 15, 23,25,45,47, 49,50, 64,65, 67,69, 72,73</b>
	<b>3.5 Applications of Determinants.</b>	<b>The Adjoint of a Matrix, Cramer's rule</b>	<b>1-4</b>	<b>2-4, 11,15, 25-27,29,43</b>
<b>Chapter 4 Vector Spaces</b>	<b>4.1 Vectors in <math>R^n</math></b>	<b>Vectors in <math>R^n</math></b>	<b>4-6</b>	<b>13,15, 23,27,28, 47-49</b>
	<b>4.2 Vector Spaces</b>		<b>2-4, 6-8</b>	<b>1, 3, 4, 6, 19-24,29(a,b), 33,34</b>
	<b>4.3 Subspaces of Vector Spaces</b>	<b>Subspaces of <math>R^n</math></b>	<b>1-4, 6, 8</b>	<b>1, 4, 7, 9, 29, 31-35, 41, 44,45</b>
	<b>4.4 Spanning Sets and Linear Independence</b>	<b>Spanning Sets, Linear Dependence and Linear Independence</b>	<b>1-13</b>	<b>2, 7,9,13,15, 18,19,21,27, 31,32, 39, 49,59,65</b>
	<b>4.5 Basis and Dimension</b>	<b>The Dimension of a Vector Space</b>	<b>1-12</b>	<b>8-9, 11,16,17,21,25,35, 41, 43,45,49,63,67, 70, 73,79</b>

	<b>4.6 Rank of a Matrix and Systems of Linear Equations</b>	<b>The Null Space of a Matrix, Systems of Linear Equations with Square Coefficient Matrices</b>	<b>1-7</b>	<b>2,3,7,9,13,15,21,23, 27,29, 35, 66</b>
<b>Chapter 6 Linear Transformations</b>	<b>6.1 Introduction to Linear Transformations</b>		<b>1, 2, 4-6, 9</b>	<b>2, 3, 9,10,15,17, 20,22,23, 32,33,39,53, 68,69,73</b>
	<b>6.2 The Kernel and Range of a Linear Transformation</b>	<b>The Range of a Linear Transformation, One-to-One and Onto Linear Transformations</b>	<b>1, 2, 4-11</b>	<b>1,3,5,9,11,13,17, 22,31,33,49,51,56</b>
<b>Chapter 7 Eigenvalues and Eigenvectors</b>	<b>7.1 Eigenvalues and Eigenvectors</b>	<b>Eigenspaces</b>	<b>1, 2, 4, 5, 7</b>	<b>2,7, 11(a,b),13(a,b), 15,17,19,23,25,63,65</b>

### Lists of Theorems

Chapters	Theorems with proofs	Theorems without proofs
<b>1</b>	–	1.1
<b>2</b>	2.7 – 2.8 – 2.9 – 2.10 – 2.11	2.1 – 2.2 – 2.3 – 2.4 – 2.5 – 2.6
<b>3</b>	3.8	3.1 – 3.2 – 3.3 – 3.4 – 3.5 – 3.6 – 3.7 – 3.9 – 3.10 – 3.11
<b>4</b>	4.5 – 4.6 – 4.7 – 4.8 – 4.9	4.2 – 4.3 – 4.4 – 4.10 – 4.11 – 4.12 – 4.13 – 4.14 – 4.15 – 4.16 – 4.17
<b>6</b>	6.2 – 6.3 – 6.6	6.1 – 6.4 – 6.5 – 6.7 – 6.8
<b>7</b>	–	7.1 – 7.2 – 7.3

### Remarks:

1. Any student who misses 25% of the class will receive DN.
2. We emphasize that each student should buy the textbook, if he or she does not have it, from the first day of classes because we will use its examples and problems to teach this course, and each student need to have a book-access-code in order to log-in to the homework system online.
3. Students should exercise all problems in HW column.
5. Homework should be submitted online on or before the due date.
6. If one of the students is absent from one of the exams due to an acceptable excuse by the instructor, then the mark will be calculated as a percentage from the total of the other exams.
7. The requirements to get an IC grade due to being absent from the final exam are: an attendance of at least 80% of the total lectures, attendance of the first and second exams and an acceptable excuse by the Educational Affairs.

**Marks distribution and important dates:**

First Exam (90 Min; 20 Marks): Monday 13/1/1437H from 1-2:30, from Chapter 1 to Chapter 3,

Second Exam (90 Min; 20 Marks): Monday 18/2/1437H from 1-2:30, Chapter 4,

Final Exam (120 Min; 40 Marks),

Homework On-Line (10 Marks),

Quiz (10 Marks).