

<b>Module Title:</b>	<b>Linear Algebra</b>
<b>Module ID:</b>	<b>MATH 244</b>
<b>Prerequisite:</b>	<b>MATH 102</b>
<b>Level:</b>	<b>5</b>
<b>Credit Hours:</b>	<b>3 (3+0+1)</b>

**Module Description:**

Matrices and their operations, Types of matrices, Elementary transformations, Linear systems of equations.(homogeneous and non-homogeneous), Solving Linear systems by Kramer,s Rule and Gaus Jordan, Determinants, elementary properties, Inverse of a matrix, Vector spaces, linear independence, finite dimensional spaces, linear subspaces, Inner product spaces, Linear transformations, kernel and image of a linear transformation, Eigen values and Eigen vectors of a matrix and of a linear operator.

**Module Aims:**

- Know the basic operations on matrices.
- Be able to solve systems of homogeneous and non-homogenous linear equations.
- Be able to solve find the inverse of matrix.
- Understanding the concepts of vectors, and vector space.

**Learning Outcomes:**

- Understand the basic concepts of linear algebra, such as matrices and its operations, determinate.

- Identification of linear systems and ways of solving them.
- Understanding the concept of vector space and its related topics such as linear independence, finite dimensional spaces.
- Identify the basis and Dimension and the rank of the matrix, inner product and linear transformation.
- To be able to do matrix operations and compute the deter
- The ability to find the invers of the matrix.
- To identify the linear combination , linear dependent and linear independence
- The development of the student's ability to use these concepts.
- The development of the student's ability to apply the above principles in practical applications.

List of Topics	No. of Weeks	Contact Hours
Matrices and their operations.	2	6
Types of matrices	1	3
Elementary transformations	1	3
Linear systems of equations.(homogeneous and non homogeneous).	1	3
Solving Linear systems by Kramer,s Rule and Gaus Jordan.	1	3
Determinants, elementary properties.	1	3
Test1	1	3
Inverse of a matrix.	1	3
Vector spaces, linear independence.	1	3
finite dimensional spaces.	1	3
linear subspaces.	1	3
Test2		
Inner product spaces.	1	3
Linear transformations, kernel and image of a linear transformation	1	3

Eigen values and Eigen vectors of a matrix and of a linear operator.	1	3
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**Textbook:**

Edition: .Elementary Linear Algebra with applications, Howard Anton, Wiley & Sons  
,9th Edition