

Form (H) Short course description

Course title: Introduction to Linear	Course number and code: MATH 240	
Algebra		
Previous course requirement: MATH 132	Language of the course: English	
Course level: 5th	Effective hours: 4(3+2+0)	

Course description

Matrices and their operations, types of matrices. Elementary transformations. Determinants and their elementary properties. Inverse of a matrix. Linear systems of equations. Vector spaces, linear independence, finite dimensional spaces, subspaces. Inner product spaces. Linear transformations, kernel and image of a linear transformation. Eigenvalues and eigenvectors of a matrix and of a linear operator.

Course objectives

1- Introduce Matrices

2- Introduce Determinants.

3- Introduce Systems of linear equations.

4- Introduce Vector spaces.

5- Introduce Inner product spaces.

6- Introduce Linear transformations.

7- Introduce Eigenvalues and Eigenvectors

Learning outcomes (understanding, knowledge, and intellectual and scientific skills)

After studying this course, the student is expected to be able to:

Define matrix operations and state their main properties.				
Calculate the determinants and matrices inverses and other operations.				
Solve a system of linear equations in the matrix form.				
Define vector spaces and subspacess, find their bases and dimension.				
Decide whether a set is a vector space.				
Decide whether a set of vectors is a basis.				
Compute the length of a vector and the angle				
between two vectors in 2D and 3D.				

Find the matrix of a linear transformation	
relative to ordered bases.	
Compute the eigenvalues and eigenvectors of a	
matrix and decide whether it is diagonalizable.	

Textbook adopted and supporting references

Title of the book	Author's name	Publisher's name	Date of publication
1-Elementary Linear Algebra with Supplemental Applications	Anton and Rorres	John Wiley,	2015
2- Topics in Algeba.	N. Herstein	Ginn and Company	1964
3- Algebra	T. W. Hungerford	Springer	1974.