Form (H)
Short course description

Course title: **Introduction to Linear Algebra**	Course number and code: MATH 240
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.