Course Specifications

General Information

Course name	Linear Algebra (1)
Course number	MATH2305
Faculty	
Department	
Course type	Major Needs
Course level	2
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - Solve systems of linear equations and homogeneous systems of linear equations by Guassian elimination and Ggauss elimination

2 - Reduce a matrix to either row-echelon or reduced row-echelon form

3 - Use matrix operations to solve systems of equations and determine the nature of the solutions

4 - Find the transpose and inverse of a matrix by performing operations

5 - Calculate determinant using row operations, column operations and expansion down any column and across any row

6 - Interpret vectors in two and three-dimensional space both algebraically and geometrically

7 - Use basic mathematical proof techniques to prove or disprove certain claims

8 - Understand the concepts of a linear transformation as a mapping from Euclidean vector space to another and find its standard matrix

9 - Understand the concept of a general vector space , basis and dimensions

Intended Learning Outcomes

Knowledge and Understanding	* to know the three basic components of linear algebra (theory, computation and applications
	* To introduce the students slowly and carefully to the art of developing and writing proofs
	* To solve consistent systems of linear equations by Gaussian elimination and by Gauss- Jordan elimination
	* To write the solution set of a given homogeneous system in parametric vector formt
Intellectual Skills	* to introduce students to abstract mathematical thinking
	* To help students to think precisely and express their thoughts clearly
	* to analyze the information to calculate the correct result
	* to think creatively and precisely and describe mathematical ideas accurately
Professional Skills	* To find the inverse of a square matrix and to know the rules of matrix arithmetic
General Skill	* to be able to learn valuable skills to discover mathematical results
	* to learn how to work in groups and cooperate with others

Course Contents

1 - Systems of linear equations ,matrices and matrix operations , Inverse , elementary matrices and a method for finding the invers
2 - Determinant – Finding determine by row Reduction ,Eigen values and Eigen vectors of the matrix
3 - Vectors in 2 and 3- space , norm of a vector, dot and cross product
4 - Euclidean n-space, transformotions
5 - Vector spaces ,Subspaces,Basis and Dimension of the vector space

Teaching and Learning Methods

1 - Lectures, Solving problems, group assignments

Students Assessment

Assessment Method	TIME	MARKS
First Mid Term	Week 6	20
Second Mid Term	Week 11	20
Homework	During semester	5
Attendance and participation	During semester	5
Final Exam	Week 16	50

Books and References

Essential books	Elementary linear algebra : applications version / Howard Anton, Chris Rorres. 11th Ed, 2014
Recommended books	Linear Algebra, Stephen Friedberg, Arnold Insel and Lawernce Spence,2015
	Linear Algebra with Applications ,Jeffrey Holt ,W. H. Freeman and Company 2013
	Linear Algebra with Applications, Jeanne Agnew, Robert C. Knapp,Brooks/Cole Pub. Co., 1983
	Elementary Linear Algebra, Ron Larson ,David C. Falvo ,Houghton Mifflin Harcourt Publishing Compan,6 Ed.2009