FACULTY OF SCIENCES - DEPARTMENT OF MATHEMATICS
COURSE SYLLABUS

COURSE TITLE	*ENGLISH CODE/NO*	*ARABIC CODE/NO.*	*CREDITS*			
			Th.	*Pr.*	*Tr.*	*Total*
Linear Algebra	MATH 241	241 ر	3			3
Pre-requisites:	MATH 202 and MATH 203					
Course Role in Curriculum	*Required or Elective:*		Required			
Catalogue Description: Systems of Linear Equations. Gauss-Jordan Elimination Method. Matrix Algebra. The Inverse of a Matrix. Determinants. Cramer's Rule. Vector Spaces and Subspaces. Euclidean Spaces. Linear Transformations. The Kernel and The Range of a Linear Transformation. Spanning Sets. Independent Sets. Bases. Dimension. Eigen values and Eigenvectors.						

***Textbooks*:**
1. David C. Lay, Linear Algebra and its Applications, Pearson Edition., 2006.

***Supplemental Materials*:**

***Course Learning Outcomes*:**
By the completion of the course the student should be able to:
1. Make the student acquainted with fundamental techniques in linear algebra such as: solving linear systems, matrix calculus, and determinants.
2. allow the student to get autonomy for finding the right method to be applied
3. help the student in how to use adequately a text book to get the appropriate information.

***Topics to be Covered*:**
1. Systems of Linear Equations
   a. Solving a Linear System
   b. Row operations on the Augmented Matrix
   c. Existence and Uniqueness questions
   d. Row Echelon Form and Reduced Row Echelon Form
   e. The Row Reduction Algorithm
   f. Calculus in the setting of the Euclidean spaces
   g. Vectors
   h. Linear Combinations
   i. Vector Equations. Linear Independence
   j. The Matrix Equation Ax = b
   k. Homogeneous and non Homogeneous systems
2. Matrix Algebra
   a. Matrix Operations
   b. The Transpose of a Matrix
   c. The Inverse of a Matrix
   d. Algorithm for finding the Inverse

e. Linear Transformations and Matrices in the setting of the Euclidean spaces

3. Determinants
   a. Properties
   b. The Cramer's Rule
4. Vector spaces
   a. Subspaces
   b. Spanning Sets
   c. Linear Independence
   d. Bases
   e. Dimension
   f. Linear Transformations
   g. The Kernel and The Range of A Linear Transformation
   h. Eigen values and Eigenvectors