

1. Course Number and Name: 012 MATH – Matrix Algebra

2. Credits and Contact Hours: 3 Credit

- a. Lecture – 3 day per week at 50 minutes for 16 weeks
- b. Laboratory – Nil

3. Course Coordinator or Instructor:

Department of Mathematics. College of Science

4. Text Book:

- Howard Anton, Elementary Linear Algebra, 8th Edition, John Wiley & Sons, Inc 2005.

5. Specific Course Information:

- a. **Catalog Description:** The course covers systems of linear equations, matrices, and determinants as tools in the study of vector spaces in detail. Linear independence, generators, and dimension are given. Also row space, rank, Eigen values, and Diagonalizable of matrix are given. Finally, the course covers linear transformation, kernel, image and change of basis
- b. **Prerequisites:** 001 MATH Mathematics 1
- c. **Status:** Required

6. Specific Goals for the Course: See the Mapping in First Page of College Requirement Courses

7. List of Topics:

- Introduction to the system of linear equations. Augmented matrices. Elementary row operations
- Gaussian Elimination Reduced row-Echelon form. Gauss-Jordan elimination. Back-Substitution Homogeneous linear system of equations.
- Matrices and Matrix operations. Matrix form of a liner system. Transpose and Trace of a matrix
- Properties of matrix operations. Properties of inverses and transpose
- A method for finding the inverse of a matrix. Further results on systems of equations and inevitability
- Diagonal, triangular and symmetric matrices.
- The determinant function - Evaluating determinants by row reduction
- Properties of the determinant function
- . Cofactor expansion-Cramer's rule-Inverse of a matrix using its ad joint.
- Vector space, Linear dependent and linear independent , Eigen values and Eigen vectors
- Basis and Dimensional of vector space