Course Syllabus

Department: Mathematics

Date: January 26, 2012

I. Course Prefix and Number: MAT 276

Course Name: Linear Algebra

Credit Hours and Contact Hours: 3 Credit Hours, 3 Contact Hours

Catalog Description including pre- and co-requisites:

A survey course of the study of elementary linear algebra through the study of finite dimensional vector spaces, linear transformations and matrices. Topics covered include vector and matrix operations, determinants, systems of linear equations, linear independence, eigenvalues and eigenvectors.

Prerequisite: MAT 271.

II. Course Outcomes and Objectives

Student Learning Outcomes:
Upon completion of the course the student will be able to:
1. Use the language and notation of elementary linear algebra.
2. Add/Subtract/Multiply/Invert matrices.
3. Add/Subtract/Scalar Multiply vectors.
4. Find and Interpret determinants of matrices.
5. Use the concepts of vector space and linear transformations to solve systems of linear equations.
6. Use equivalent conditions to determine when a set of vectors is linearly independent.
7. Find eigenvalues and eigenvectors.
8. Evaluate their results for reasonableness.

Relationship to Academic Programs and Curriculum:
This course is a service course that fulfills mathematics/science course requirements for many A.A. and A.S. degrees. A student should verify the appropriateness of this course for his program with his advisor.

College Learning Outcomes Addressed by the Course:

☐ writing	☐ computer literacy
☐ oral communications	☐ ethics/values
☒ reading	☐ citizenship
☒ mathematics	☐ global concerns
☒ critical thinking	☐ information resources

III. Instructional Materials and Methods

Types of Course Materials:
1. Textbook: Selected by department.
2. Calculator: Texas Instrument TI-83 plus

Methods of Instruction (e.g. Lecture, Lab, Seminar …):

1. Lectures
2. Discussions
3. Demonstrations
4. Group activities

IV. Assessment Measures (Summarize how the college and student learning outcomes will be assessed):

Student Learning Outcomes will be assessed through a variety of activities. The Mathematics department believes that each instructor should determine the grading system and evaluation methods that will be used in their sections of the course. Any grading system used in the course must be consistent with the College Catalog. These methods must be communicated to students the first week of the semester in writing. Possible evaluation methods include quizzes, tests, portfolios, collected assignments, group activities, et. al. Such evaluations and related assignments will develop a student's ability to read problems carefully, perform mathematics and use critical thinking techniques. Course policies with respect to attendance, late work, plagiarism, etc. must be communicated to the student.

V. General Outline of Topics Covered:
1) Systems of Linear Equations
   a) M equations in n unknowns
   b) Gauss-Jordan Elimination
   c) Homogeneous Systems of Equations

2) Vectors and Matrices
   a) Vectors
   b) Matrices
   c) Matrices and Linear Systems of Equations
   d) Linear Independence

3) Determinants
   a) Properties
   b) Inverses

4) Vector Spaces
   a) Properties
   b) Subspaces
   c) Linear Combinations
   d) Basis and Dimension

5) Linear Transformation
   a) Properties
   b) Rank and Nullity
   c) Matrix Representation

6) Eigenvalues and Eigenvectors
   a) Eigenvalues and Eigenvectors

b) Diagonalization
c) Jordan Canonical Form