**MATH 206 Linear Algebra I**

1. **Catalog Description**

   **MATH 206 Linear Algebra I**  
   4 units

   Prerequisite: MATH 143.


2. **Required Background or Experience**

   Math 143 or consent of instructor.

3. **Learning Objectives**

   The student should be able to:

   a. Understand the concept of matrices and their role in linear algebra and applied mathematics.
   b. Have a complete understanding of linear systems $Ax = b$, and the role of rank, subspace, linear independence, etc. in the analysis of these systems.
   c. Understand eigenvalues and eigenvectors of matrices and their computation.
   d. Know the concept of determinant and its properties.
   e. Understand the concepts of vector space and linear maps when the vector space is $\mathbb{R}^n$.
   f. Understand important definitions in linear algebra and the ability to do very elementary proofs.

4. **Text and References**

   To be chosen by instructor. Suggested texts include:

   - Lay, David C., *Linear Algebra and its Applications*
   - Bretscher, Otto, *Linear Algebra with Applications*

5. **Minimum Student Materials**

   Paper, pencils, and notebook.
6. **Minimum University Facilities**

   Classroom with ample chalkboard space for class use. Use of a computer lab is optional.

7. **Content and Method**

   a. Systems of linear equations
   b. Matrix and vector operations
   c. Properties of $\mathbb{R}^n$ (linear combinations, bases, spanning set, dimensions, dimension equation)
   d. Coordinate systems and change of basis
   e. Determinants
   f. Eigenvalues and eigenvectors
   g. Orthogonality
   h. Diagonalization of symmetric matrices
   i. Further topics selected by instructor

8. **Methods of Assessment**

   The primary methods of assessment are: essay examinations, quizzes and homework. Typically, there will be one or more hour-long examinations during the quarter, and a required comprehensive final examination. Students are required to show their work, and are graded not only on the correctness of their answers, but also on their understanding of the concepts and techniques.