

## **MAT291 Linear Algebra**

**This course stresses mathematical structure and axiomatic reasoning, linear systems of equations, matrix notation, linear dependence and linear independency, vector spaces, linear functions, and equivalent matrices. Prerequisite: Placement or grade of C or better in Calculus II (Mat282) or taken concurrently or permission of instructor.**

### *Course Textbook and Supplementary Materials*

**Elementary Linear Algebra, Ron Larson and Bruce Edwards, Fourth Edition (2000), Houghton Mifflin Publishing Company**

**Student Solution Guide, Elementary Linear Algebra, by Larson and Edwards, Fourth Edition, Houghton Mifflin Publishing Company**

### *Course Topics*

**Systems of Linear Equations, Gaussian Elimination and Gauss-Jordan Elimination, Applications of Systems of Linear Equations, Operations with Matrices, Properties of Matrix Operations, the Inverse of a Matrix, Elementary Matrices, Applications of Matrix Operations, the Determinant of a Matrix, Elementary Operations on Determinants,**

**Properties of Determinants, Applications of Determinants, Vectors in  $\mathbb{R}^n$ , Vector Spaces, Subspaces of Vector Spaces, Spanning Sets and Linear Independence, Basis and Dimension, Rank of a Matrix, Coordinates and Changes of Basis, Applications of Vector Spaces, Length and Dot Product in  $\mathbb{R}^n$ , Inner Product Spaces, Orthonormal Bases: Gramm Schmidt Process, Mathematical Models and Least Squares Analysis.**

*Grading System/Test Schedule*

**Five (5) Chapter Examinations, Each  
@ 20% of Final Grade**

**One (1) "Writing Across the Curriculum" Term Paper  
@ Maximum of 20% Extra Credit**

**Examination One, Chapter One.....9/26/ 2002  
Examination Two, Chapter Two.....10/31/2002  
Examination Three, Chapter Three.....11/21/2002  
Examination Four, Chapter Four..... 12/12/2002  
Examination Five, Chapter Five..... 12/18/ 2002**

*Assignment Schedule*

**All odd numbered problems in the exercises for each section of each chapter will be completed by the date of the chapter examination.**

*Reading Schedule*

**Each chapter, in its entirety, should be read and studied, prior to the chapter examination test date.**

*Attendance Schedule*

**In that the course meets weekly, only two (2) unexcused absences will be allowed.**

*Course Methodology*

**Standard Lecture Approach**