ASHEVILLE-BUNCOMBE TECHNICAL COMMUNITY COLLEGE
MATHEMATICS DEPARTMENT
COMMON SYLLABI DIRECTORY

PREFIX: MAT **NUMBER:** 280 **TITLE:** Linear Algebra

CONTACT HOURS: 3 **CREDIT HOURS:** 3

CCL DESCRIPTION: This course provides a study of linear algebra topics with emphasis on the development of both abstract concepts and application. Topics include vectors, systems of equations, matrices, determinants, vector spaces, linear transformations in two and three dimensions, eigenvectors, eigenvalues, diagonalization, and orthogonality. Upon completion, students should be able to demonstrate both an understanding of the theoretical concepts and appropriate use of linear algebra models to solve application problems. *This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural science and mathematics.*

PREREQUISITE(S): MAT 271 **COREQUISITE(S):** None

TEXTBOOK: David C. Lay, Linear Algebra and Its Applications, 3rd Edition, Addison Wesley Publishing Company, 2003.

DELIVERY METHOD: Traditional

GRADING POLICY: Homework (20%) Chapter Tests (60%) Final Examination (20%)

CONTENT OUTLINE:

1.1 Systems of Linear Equations
1.2 Row Reduction and Echelon Forms
1.3 Vector Equations
1.4 The Matrix Equation AX=B
1.5 Solution Sets of Linear Systems
1.6 Applications
1.7 Linear Independence
1.8 Linear Transformations

2.1 Matrix Operations
2.2 Inverse of a Matrix
2.3 Invertible Matrices
2.4 Partitioned Matrices
2.5 Matrix Factorizations
2.6 Applications
4.1 Vector Spaces and Subspaces
4.2 Null and Column Spaces, and Linear Transformations
4.3 Linearly Independent Sets and Bases
4.4 Coordinate Systems
4.5 Dimensions of a Vector Space
4.6 Rank
4.7 Change of Basis
4.8 Applications
5.1 Eigenvectors and Eigenvalues
5.2 The Characteristic Equation
5.3 Diagonalization
5.4 Eigenvectors and Linear Transformations
5.5 Complex Eigenvalues
6.1 Inner Product, Length, and Orthogonality
6.2 Orthogonal Sets
6.3 Orthogonal Projections
6.4 Gram-Schmidt Process and QR Factorizations
6.5 Least-Squares Problem
6.6 Applications
7.1 Diagonalization of Symmetric Matrices
7.2 Quadratic Forms

COMMENTS: This course operates on the seminar model. Students will play an active role in the teaching and learning process.