SUFFOLK COUNTY COMMUNITY COLLEGE
COLLEGE-WIDE COURSE SYLLABUS
MAT206 (formerly MA93)

I. COURSE TITLE:
Linear Algebra

II. CATALOG DESCRIPTION:
Study of vector spaces, subspaces, linear independence, bases, dimension, linear transformations, matrices, diagonalization processes, determinants, Euclidean spaces and orthonormal bases. Prerequisite: C or better in MAT142.

A-G / 3 cr. hrs.

III. COURSE GOALS:

A. Introduce the formal concept of a vector space.
B. Provide a gateway to the study of advanced mathematics.
C. This course satisfies the SUNY general education requirement for mathematics.

IV. COURSE OBJECTIVES:

Upon successful completion of this course, students will be able to:

1. comprehend definitions of an abstract nature;
2. prove or disprove whether a certain set of conditions meets the criteria of a given definition;
3. comprehend theorems and reproduce their proofs;
4. solve original problems using definitions and previously proved theorems;
5. apply the abstract to practical problems;

F. give geometric interpretations where applicable.

(In #7-#11, the word "understand" means #1-#6.)

The student will be able to demonstrate an understanding of:

7. vector spaces, subspaces, and their properties and representation;
8. equivalence relationships in general and row equivalent matrices in particular;
9. matrices and their operations;
10. linear transformations and their properties;
11. the relationship between linear transformations and matrices.

V. Topics Outline with Timeline

Topics	**Approximate Time (Including Examinations)**
A. Matrices: 1. arithmetic of matrices 2. properties of elementary matrices 3. inverse of a matrix 4. solutions of linear equations 5. diagonalization of a matrix 6. equivalence relations	4 weeks
B. Vector Spaces: 1. definitions 2. subspaces 3. isomorphic vector spaces 4. linear independence 5. basis 6. dimension 7. row space of matrix 8. change of basis	5 weeks
C. Linear Transformations: 1. definitions 2. homorphism of vector spaces 3. kernel of a linear transformation 4. rank 5. nullity 6. fundamental theorems 7. 1-1 and onto transformation 8. matrix representation and arithmetic of linear transformation	4 weeks
Optional Topics: It is recommended that at least one of the following topics be covered:	
D. Euclidean Spaces: 1. length and angle 2. abstract Euclidean spaces 3. orthonormal basis and Gram-Schmidt process	2 weeks
E. Determinants: 1. determinant function: basic properties 2. inverse of a matrix 3. diagonalization of a square matrix	2 weeks

VI. Evaluation of Student Performance:
To be determined by the instructor

VII. Programs that require this course:
Liberal Arts and Sciences: Mathematics Emphasis/AA (recommended)

VIII. Courses that require this course as a prerequisite:
None

IX. Supporting Information:
Mathematics tutoring services, as well as video and computer aids, are provided for all students through the Math Learning Center (Ammerman Campus, Riverhead 235), the Academic Skills Center Annex (Grant Campus, Health, Sports and Education Center 129), and the Academic Skills Center (Eastern Campus, Orient 213).