

LABETTE COMMUNITY COLLEGE BRIEF SYLLABUS

SPECIAL NOTE:

This brief syllabus is not intended to be a legal contract. A full syllabus will be distributed to students at the first class session.

TEXT AND SUPPLEMENTARY MATERIALS USED IN THE COURSE (if any):

Please check with the LCC bookstore <http://www.labette.edu/bookstore> for the required texts for this class.

COURSE NUMBER: MATH 121

COURSE TITLE: MATRIX ALGEBRA

SEMESTER CREDIT HOUR: 3

DEPARTMENT: Mathematics

DIVISION: General Education

PREREQUISITE: Placement Test Recommendation or
MATH 115 College Algebra (C or better)

COURSE DESCRIPTION:

This is an introductory course covering basic linear algebra, matrices, and their applications to the sciences, math, business, and economics. The course will cover matrices and matrix algebra, solution of linear systems of equations, the determinant of a matrix and its properties, eigenvalues and eigenvectors of matrices, and vector and inner product spaces.

COURSE OUTCOMES AND COMPETENCIES:

Students who successfully complete this course will be able to:

1. Apply and use the properties of matrix algebra.

- Set up matrices to describe and solve real applications.
- Add, subtract, and multiply matrices.
- Interpret and use the geometry of linear combinations and matrix transformations.

2. Set up and solve systems of linear equations.

- Solve systems by transforming matrices to echelon form using Gaussian and Gauss-Jordan elimination.
- Solve linear systems by using matrix inversion techniques.
- Solve linear systems using Cramer's Rule.

3. Calculate and use the determinant of a matrix to solve systems and applications.

- Compute the determinant using row operations.
- Use properties of the determinant to solve linear systems.
- Calculate, interpret, and apply the cross product matrix of vectors.

4. Compute the eigenvalues and eigenvectors for a matrix.

- Compute the eigenvalues for a matrix and determine the eigenvector associated with each eigenvalue.
- Diagonalize a matrix.
- Study similar and orthogonal matrices.

5. Study the properties and structure of vector and inner product spaces.

- Define the properties of a vector space.
- Define the properties of an inner product space.
- Study and apply the dot (inner) product and cross (vector) Product of a matrix.