LABETTE COMMUNITY COLLEGE BRIEF SYLLABUS

SPECIAL NOTE:
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 122

COURSE TITLE: INTRODUCTION TO ANALYTICAL PROCESSES

SEMESTER CREDIT HOUR: 3

DEPARTMENT: Mathematics

DIVISION: General Education

PREREQUISITE: Placement Test Recommendation of MATH 125
                            Trigonometry or higher or successful completion of
                            MATH 115 College Algebra with a C or better

COURSE DESCRIPTION:
This course will begin with a review of algebra skills. It will introduce topics in elementary linear algebra including vectors and vector operations with respect to business applications. It will also introduce topics in differential and integral calculus. The optimization of functions using the derivative of both single and multivariate functions is presented. Throughout the course emphasis will be given to practical applications in business management and accounting.

COURSE OUTCOMES AND COMPETENCIES:
Students who successfully complete this course will be able to:

1. Learn and apply concepts in Elementary Linear Algebra.

- Express linear relationships between price and quantity using linear supply and demand curves.
- Interpret and communicate the meaning of slope and intercepts in linear supply and demand curves.
- Interpret and communicate about vectors and use vector operations in business and accounting applications.
- Interpret and communicate about matrices and use matrix operations in business and accounting applications.

- Graph and interpret linear relationships within a business context.

2. Learn to Solve Linear and Nonlinear Systems of Equations.

- Use systems of equations to describe and solve business and accounting applications.
- Solve nonlinear systems of equations using the Substitution Method.
- Solve systems of equations using matrix inversion.
- Solve systems of equations using Cramer's Rule.
- Express solutions to dependent systems of equations as a linear combination of vectors.

3. Learn and apply the concepts and properties of the limit of a function.

- Use graphs, input/output tables, and properties of continuity to take limits of functions.
- Apply algebraic properties of limits to functions.
- Calculate the average rate of change of functions to establish quantities like average production, average cost, average revenues, etc.
- Take the limit of the average rate of change to define the derivative of a function.

4. Learn and apply the concepts and properties of the derivative of a function.

- Apply the concept of the derivative as the rate of change of a function in applications of marginal profit, revenue, cost, etc. as well as rate of change applications in the sciences.
- Apply differentiation techniques (power rule, sum-difference, product, quotient, and chain rules) to various functions.
- Evaluate and test the first and second derivative to maximize, minimize, and optimize functions with applications in business and economics.
- Apply the concepts of the derivative to approximate graphs of nonlinear functions.
- Estimate changes in value using differentials.

5. Apply properties of limits and derivatives to the exponential and logarithmic functions.

- Learn basic derivative properties of the exponential and log functions of any base.
- Apply the exponential and log functions to discuss growth and decay applications in business, economics, and the sciences.

6. Learn techniques to determine the anti-derivative and the integral of functions used in the class.

- Find the anti-derivative of functions used in the class.
- Evaluate the area under a curve as the integral and apply units of measure to interpret the meaning of this area.
- Use techniques such as U, dU substitution, Parts, and Tables of Integrals to find the integral of various more complicated functions.
- Apply the integral to problems in business and economics.