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 131

COURSE TITLE: CALCULUS II

SEMESTER CREDIT HOUR: 5

DEPARTMENT: Mathematics

DIVISION: General Education

PREREQUISITE: MATH 130 - Calculus I

COURSE DESCRIPTION:
This second course in the calculus sequence will cover the concepts of limits as applied to transcendental functions. Various substitution techniques for evaluating integrals will be presented. Problems involving areas, volumes of surfaces, and moments will be developed and solved. The course will cover sequences and series and look at properties of convergence and divergence. There will be an introductory look at differential equations and coverage of polar coordinates and parameterized curves. This course is required of any student seeking a degree in physics, mathematics, engineering, chemistry, and other related fields at a four-year institution.

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

1. Apply the integral to calculate the areas, volumes of surfaces, arc length, work, pressure, and centers of mass in applications of geometry and the physical sciences.

- Calculate the area between two curves using the integral.
- Calculate volumes of surfaces using Disks, Washers, and Cylindrical Shells and evaluate the problem for the choice of the best method to apply.
- Calculate the length of a curve and the area of a surface defined by rotation of the curve about an axis.
- Apply the integral in various forms to set up and calculate work, fluid pressures, and the center of mass of physical objects.

2. Learn and apply different techniques to integrate functions beyond the scope of the rules of integration of Calculus I.

- Reverse the product rule for derivatives by using Integration by Parts.
- Integrate rational functions using Partial Fraction Decomposition.
- Apply Trigonometric Substitutions to handle forms with radicals in the integrand.
- Evaluate and identify forms of the integrand so that a set of integral tables can be used establish the integral of a function.
- Apply the concepts of limit, convergence, and divergence to evaluate Improper Integrals.
- Differentiate and integrate exponential and logarithmic forms "base a" ($y = \log_a x$, $y = a^x$).
- Differentiate and integrate inverse trigonometric functions.
- Differentiate and integrate hyperbolic functions.
- Solve first order differential equations (single variable integration, separation of variables, applications).

3. Apply properties of calculus to polar curves and curves in parametric form.

- Classify and graph the conic sections and solve applications using these curves.
- Apply polar coordinate transformations to graph curves and calculate areas of Polar Regions.
- Parameterize curves and do differential and integral calculations upon them.

4. Evaluate and apply properties of infinite series to problems in calculus.

- Determine limits to infinite sequences.
- Determine convergence and divergence of infinite series using concepts such as the integral test, comparison tests, limit tests, alternating series, absolute convergence, and partial sums.
- Use Taylor Series and Maclaurin Series to determine series expansions for functions such as exponentials, logs, sine, cosine, etc.