MAT 122 - Calculus with Analytic Geometry II
Course Credit: 3 semester hours

Course Description: A study of single-variable integral calculus with applications to area, arc length, surfaces of revolution and work. Techniques discussed include integration by parts, partial fractions, trig substitutions and improper integrals.

Rationale: This course is intended for mathematics, science, and engineering students. It is the second course of what could be a four-semester Calculus sequence.

Prerequisites: MAT121

Learning Objectives: Upon successful completion of this course, the student will be able to understand the concept of a Riemann sum, apply the fundamental theorem of calculus, evaluate an indefinite integral using a variety of integration techniques, apply the techniques of integration to applications such as finding volume, arc length, surface area, rate of change, and physical applications.

Instructional Procedures/Techniques:
The method of instruction may include lecture, group problem solving, individual problem solving, demonstrations, computer lab assignments, quizzes and examinations.

Outline of Topics:
- Antiderivatives
- Riemann Sums and Definite Integrals
- Fundamental Theorem of Calculus
- Integration Techniques
- Differential Equations
- Disk Method: Volume
- Shell Method: Volume
- Arc Length and Surfaces of Revolution
- Applications of Integration
- Integration by Parts
- Trig Substitution
- Partial Fractions
- Improper Integrals
- Numerical Integration

Materials Required: Calculus: Early Transcendental Functions by Ron Larson and Bruce Edwards, 8th ed.

Attendance and Make-up tests: Any student whose absences, whether excused or unexcused, accumulate to 12 in semester classes meeting 3 times per week or 8 in semester classes meeting 2 times per week or 4 in semester classes meeting once a week automatically receives a grade of F in the course. The responsibility for missed work rests entirely with the student.

Academic Integrity: Students are expected to do their own work. Refer to the following website: www.mc.edu/publications/policies/219.html.