Single Variable Calculus I Early Transcendentals

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| **C-ID Number** | MATH 210 |
| **Discipline** | Mathematics |
| **Date Approved** | March 31, 2011 |

## General Course Description

A first course in differential and integral calculus of a single variable: functions; limits and continuity; techniques and applications of differentiation and integration; Fundamental Theorem of Calculus. Primarily for Science, Technology, Engineering and Math Majors.

## Minimum Units

4.0

## Any rationale or comments

## Advisories/Recommendations

## Course Content

Definition and computation of limits using numerical, graphical, and algebraic approaches; Continuity and differentiability of functions; Derivative as a limit; Interpretation of the derivative as: slope of tangent line, a rate of change;  Differentiation formulas: constants, power rule, product rule, quotient rule and chain rule; Derivatives of transcendental functions such as trigonometric, exponential or logarithmic; Implicit differentiation with applications, and differentiation of inverse functions; Higher-order derivatives; Graphing functions using first and second derivatives, concavity and asymptotes; Maximum and minimum values, and optimization; Mean Value Theorem; Antiderivatives and indefinite integrals; Area under a curve; Definite integral; Riemann sum; Properties of the integral; Fundamental Theorem of Calculus; Integration by substitution; Indeterminate forms and L'Hopital's Rule;

## Laboratory Activities

## Course Objectives

Upon successful completion of the course, students will be able to: Compute the limit of a function at a real number; Determine if a function is continuous at a real number; Find the derivative of a function as a limit; Find the equation of a tangent line to a function; Compute derivatives using differentiation formulas; Use differentiation to solve applications such as related rate problems and optimization problems; Use implicit differentiation; Graph functions using methods of calculus; Evaluate a definite integral as a limit; Evaluate integrals using the Fundamental Theorem of Calculus; and Apply integration to find area.

## Prerequisites

Pre-calculus, or college algebra and trigonometry, or equivalent.

## Corequisites

## Methods of Evaluation

Tests, examinations, homework or projects where students demonstrate their mastery of the learning objectives and their ability to devise, organize and present complete solutions to problems.

## Sample Textbooks

A college level textbook designed for science, technology, engineering and math majors, and supporting the learning objectives of this course.

## Notes