# Single Variable Calculus I Late Transcendentals

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| **C-ID Number** | MATH 211 |
| **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 trigonometric functions 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 Applications of integration to areas and volumes Definite integral; Riemann sum Properties of the integral Fundamental Theorem of Calculus Integration by substitution

## Laboratory Activities

## Course Objectives

At the conclusion of this course, the student should 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 Use the definite integral to find areas and volumes

## Prerequisites

Precalculus, 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