# C-ID Descriptor
# Single Variable Calculus I Early Transcendentals

## Descriptor Details

- **Descriptor Title**: Single Variable Calculus I Early Transcendentals
- **Parent Descriptor**: Single Variable Calculus I Late Transcendentals MATH 211
- **C-ID Number**: 210
- **Units**: 4.0
- **Date of Last Revision**: 10/12/2017 04:43:56 PM PDT

## General 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 & Math Majors.

## Prerequisites

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

## Corequisites

No information provided

## Advisories

No information provided

## Content

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

## Lab Activities

No information provided

## Objectives

*Upon successful completion of the course, students will be able to:*

1. Compute the limit of a function at a real number;
2. Determine if a function is continuous at a real number;
3. Find the derivative of a function as a limit;
4. Find the equation of a tangent line to a function;
5. Compute derivatives using differentiation formulas;

6. Use differentiation to solve applications such as related rate problems and optimization problems;
7. Use implicit differentiation;
8. Graph functions using methods of calculus;
9. Evaluate a definite integral as a limit;
10. Evaluate integrals using the Fundamental Theorem of Calculus; and
11. Apply integration to find area.

## Evaluation Methods

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.

## Textbooks

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