

**J. Sargeant Reynolds Community College
Course Content Summary**

Course Prefix and Number: MTH 173

Credits: 5

Course Title: Calculus with Analytic Geometry I

Course Description (including lecture hours, lab hours, total contacts)

Presents analytic geometry and the calculus of algebraic and transcendental functions including the study of limits, derivatives, differentials and introduction to integration along with their applications. Designed for mathematical, physical, and engineering science programs. Credit will not be awarded for more than one of MTH 173, MTH 175, or MTH 273. Lecture 5 hours per week.

General Course Purpose

Presents basic calculus concepts for upper level mathematical analysis.

Course Prerequisites/Corequisites (*Entry-level competencies **required** for enrollment*)

Prerequisites: a placement recommendation for MTH 173 and four units of high school mathematics including Algebra I, Algebra II, Geometry, and Trigonometry or equivalent.

Course Objectives (Each item should complete the following sentence.)

Upon completing the course, the student will be able to:

- a. Evaluate limits of various kinds, including one-sided limits, two-sided limits, limits as x approaches infinity, and limits which are infinite.
- b. Determine whether a function is continuous at a point or on an interval.
- c. Demonstrate an understanding of the derivative and find derivatives of various functions using product, quotient, power, and chain rules.
- d. Use the derivative in applications including related rates, optimization, and curve sketching.
- e. Demonstrate understanding of the integral and evaluate indefinite integrals.
- f. Differentiate and integrate logarithmic and exponential functions.
- g. Use the definite integral in applications including area, volume, arc length, and centers of mass.
- h. Use derivative and integral formulas involving inverse trigonometric functions and hyperbolic functions.

Major Topics to be Included

- a. Limits and their Properties
- b. Differentiation
- c. Applications of Differentiation
- d. Integration
- e. Logarithmic, Exponential and Other Transcendental Functions
- f. Applications of Integration

Effective Date of Course Content Summary (Month, Date Year): February, 2009