

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

Course Prefix and Number: MTH 270

Credits: 3

Course Title: Applied Calculus

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

Introduces limits, continuity, differentiation, and integration of algebraic and transcendental functions, techniques of integration, and partial differentiation. Lecture 3 hours per week.

General Course Purpose

This course prepares students for the application of calculus in a variety of fields.

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

MTH 270 requires satisfactory completion of MTH 163 or MTH 166 or equivalent. (Credit will not be awarded for both MTH 270 and MTH 271.)

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

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

- a. Use properties of functions given to evaluate and sketch their graphs.
- b. Find the indicated limits (if any exist) of a given function.
- c. Determine the points of discontinuity (if any) of a given function.
- d. Determine the value of c so that a function is continuous.
- e. Find the slope of a curve with the limit process.
- f. Find the derivative of a given function.
- g. Find the critical numbers (if any) and the open intervals on which a function is increasing or decreasing. Sketch the graph of the function.
- h. Locate the extrema of a function (if any exist) over an indicated interval.
- i. Find the intervals on which a given function is concave upward and those on which it is concave downward.
- j. Find inflection points (if any) of a given function.
- k. Solve word problems involving functions.
- l. Determine horizontal and vertical asymptotes of functions.
- m. Analyze and sketch the graph of a function (optional).
- n. Find differentials of given functions.
- o. Find antiderivatives of given functions.
- p. Determine the area of a region having given boundaries.
- q. Evaluate a definite integral.
- r. Determine the average value of function on an interval.
- s. Use the properties of exponents to evaluate given expressions.
- t. Sketch the graph of a given exponential function.
- u. Differentiate and integrate exponential and logarithmic functions.
- v. Solve equations involving exponential and logarithmic functions.
- w. Solve word problems involving exponential and logarithmic functions.
- x. Use integration by parts and substitution techniques to evaluate integrals.
- y. Perform integration using tables of integrals, where appropriate.

- z. Given a function of several variables, find partial derivatives with respect to any of the variables.

Major Topics to be Included

- a. Functions, Graphs, and Limits
- b. Differentiation
- c. Applications of the Derivative
- d. Exponential and Logarithmic Functions
- e. Integration and its Application
- f. Techniques of Integration
- g. Functions of Several Variables

Effective Date of Course Content Summary (Month, Date Year): Fall 2007