

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

**Course Prefix and Number:** MTH 174

**Credits:** 5

**Course Title:** Calculus with Analytic Geometry II

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

Continues the study of analytic geometry and the calculus of algebraic and transcendental functions including rectangular, polar and parametric graphing, indefinite, and definite integrals, methods of integration and power series along with applications. Lecture 5 hours per week.

**General Course Purpose**

Continues to present basic calculus concepts for upper level mathematical analysis.

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

MTH 173 or equivalent.

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

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

- a. Use a variety of techniques to evaluate integrals including parts, trigonometric integration and substitution, partial fractions, and tables.
- b. Evaluate limits of indeterminate forms and improper integrals.
- c. Determine whether a series converges or diverges using various tests.
- d. Demonstrate understanding of power series including Taylor and Maclaurin series.
- e. Demonstrate understanding of calculus applications to parametric equations and area and arc length of polar equations.
- f. Demonstrate understanding of the use of vectors to describe the geometry of space and perform various vector operations including dot and cross product.
- g. Determine equations of lines and planes in space.
- h. Differentiate and integrate vector-valued functions and apply vector-valued functions to velocity, acceleration, tangent and normal vectors, arc length, and curvature.
- i. Apply calculus concepts including limits, continuity, differentiation, the chain rule, tangency, differentials, and extrema to functions of several variables.

**Major Topics to be Included**

- a. Integration Techniques, L'Hopital's Rule, and Improper Integrals
- b. Infinite Series
- c. Parametric Equations
- d. Polar Coordinates and Polar Graphs
- e. Vectors and the Geometry of Space
- f. Vector-Valued Functions
- g. Functions of Several Variables

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