

J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: MTH 262

Credits: 3

Course Title: Applied Calculus II

Course Description: Covers techniques of integration and an introduction to differential equations and multivariable calculus, with an emphasis throughout on applications in business, social sciences, and life sciences. Replaces MTH 272. Prerequisite: Completion of MTH 261 or equivalent with a grade of C or better. Lecture 3 hours per week.

General Course Purpose: Students in business, social sciences, and life sciences who have completed Applied Calculus I seeking continued study of applied calculus would benefit from this course. Most students in these disciplines will be well served with one semester of applied calculus and one semester of statistics. This course is intended for those who will transfer to an institution requiring two semesters of applied calculus in one of these disciplines. This course is not appropriate for students in most STEM disciplines.

Course Prerequisites and Co-requisites:

Prerequisite: Completion of MTH 261 or equivalent with a grade of C or better

Student Learning Outcomes:

Upon completing the course, the student will be able to

1. (Integration and Its Applications)
 - Use basic integration formulas to find indefinite integrals of algebraic, exponential, and logarithmic functions;
 - Develop the concept of definite integral using Reimann sums;
 - Evaluate definite integrals using Fundamental Theorem of Calculus;
 - Use the method of integration by substitution to determine indefinite integrals;
 - Evaluate definite integrals using substitution with original and new limits of integration;
 - Calculate the area under a curve over a closed interval $[a, b]$;
 - Calculate the area bounded by the graph of two or more functions by using points of intersections;
 - Use integration to solve applications in business and economics, such as future value and consumer and producer's surplus;
2. (Techniques of Integration; Differential Equations)
 - Use the method of integration by parts to find antiderivatives and evaluate definite integrals;
 - Integrate using tables of integrals;
 - Approximate integrals using numerical integration (Trapezoidal and Simpson's rules);
 - Evaluate improper integrals;
 - Solve basic first order differential equations;
 - Use simple integration and separation of variables to solve differential equations;
3. (Multivariable Calculus)
 - Evaluate functions of several variables and sketch three-dimensional surfaces;
 - Calculate partial derivatives of functions of several variables;

- Calculate maxima and minima of functions of several variables;
- Calculate constrained maxima and minima using the Method of LaGrange Multipliers;
and
- Evaluate multiple integrals.

Major Topics to Be Included:

1. Integration and Its Applications
2. Techniques of Integration; Differential Equations
3. Multivariable Calculus

Date Created/Updated (Month, Day, and Year): August 8, 2017