MTH 264 - Calculus II

Course Description

Effective: 2019-08-01

Continues the study of 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. Features instruction for mathematical, physical and engineering science programs. This is a Passport Transfer course. Lecture 4 hours. Total 4 hours per week.
4 credits

General Course Purpose

The general purpose of this second course in a three course sequence is to prepare students for further study in calculus with analytic geometry as well as topics such as linear algebra and differential equations so that they meet the necessary competencies in integration, algebraic and transcendental functions, graphing, power series and their applications.

Course Prerequisites/Corequisites

Prerequisite: Completion of MTH 263 or equivalent with a grade of C or better.

Course Objectives

- Applications of Integration
  - Compute Volumes by cross-section
  - Compute Volumes by disk-washer
  - Compute Volumes by shells
  - Compute Work (spring, rope)
  - Compute Work (pumping liquids)
  - Compute Arc length
  - Compute Areas of surfaces of revolution
  - Compute Application (center of mass)
- Techniques of Integration
  - Integrate by parts
  - Calculate trigonometric integrals
  - Calculate integrals by trigonometric substitution
  - Define the indeterminate form and apply L'Hopital's Rule.
  - Calculate improper integrals
  - Integrate by partial fractions
  - Integrate using Tables and Software
  - Approximate integrals (Trapezoidal, Simpson) with error estimation.
- Infinite Sequences and Series

    - Write definition of and understand Sequences
    - Write definition of and understand Series (intro)
    - Determine convergence by integral test
    - Determine convergence by comparison test
    - Determine convergence of alternating series
    - Determine absolute convergence (ratio, root tests)
    - Apply strategies for testing series
    - Work with power series
    - Represent functions as power series
    - Find Taylor, Maclaurin series & polynomials
    - Calculate Taylor and Maclaurin series
- Parametric Curves and Polar Coordinates
    - Represent curves by parametric equations
    - Perform calculus with parametric curves
    - Use and graph with polar system
    - Calculate areas and lengths in polar coordinates
    - Define the conic forms in polar form

Major Topics to be Included

- Applications of Integration
- Techniques of Integration
- Infinite Sequences and Series
- Parametric Curves and Polar Coordinates