Objective: To study differential equations and their applications.

Intended for: Majors in Mathematical or Physical Sciences and students in the Dual-Degree Engineering Program.

Prerequisite: Calculus II (MATH 202 with a grade of C or better).


Introduction to Differential Equations
Basic Definitions and Terminology, Directed Fields, Phase Portraits.

First-Order Differential Equations
Preliminary Theory (initial value problems), Separable Equations, Exact Equations, Linear Equations, Applications (linear and nonlinear).

Mathematical Models and Numerical Methods
Population Models, Improved Euler's Method, Runge-Kutta Methods

Higher-Order Equations

Applications
Mechanical Vibrations, Harmonic Motion, Damped and Forced Vibrations.

Series Solutions

Systems of Differential Equations

Selected Topics

Tests

EVALUATION
Homework/Project 25%
Exams 50%
Final Exam 25%

NOTE: Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.