

Department: Mathematics
Course Name: Applied Calculus

Course Description:

Calculus is a one-year course for students who have completed precalculus preparation. Topics covered include a unified analysis of functions, limits, differentiation, and integration, with particular attention to the need of calculus techniques in problem solving. An emphasis on critical thinking, complex communication, collaboration, creativity, and risk-taking while promoting a global perspective will prepare students for rigorous college work. This course is an introduction to a college calculus course.

Content:

Functions
Limits and continuity
Differentiation
Applications of the derivative
Differential Equations
Integration
Applications of the definite integral
Principles of integral evaluation

Skills:

Define and develop the concept of a “function”
Combine functions
Find inverses of algebraic and exponential functions
Algebraic and graphic techniques for finding limits
Finding limits at infinity
Define and determine continuity of relations
Find tangent lines to curves
Analyze rectilinear motion
Find general rates of change
Define and calculate the derivative in terms of limits
Calculate derivatives using techniques of differentiation
Differentiate implicit functions
Use derivatives to solve related rates problems
Determine the exact shape of a graph and the precise locations of its key features
Use derivatives to analyze the graphs of polynomials
Use calculus to graph function curves
Finding absolute extrema
Solve optimization problems
Differentiate exponential and logarithmic functions
Calculate areas of plane regions with curvilinear boundaries using antidifferentiation
Develop and use techniques of integration
Calculate definite integrals
Use integration to analyze rectilinear motion
Find area between two curves
Calculate volume with cross sections

Text and Materials:

Calculus, An Applied Approach by Ron Larson

Methods of Instruction:

Interactive discussions and questioning

Application activities

Guided individual practice

Cooperative learning

Graphing calculator demonstrations and exploration

Online videos

Desmos activities

Methods of Evaluation:

Homework

Quizzes on partial units of study

Cumulative semester exam

