

Course: Math 251

Prerequisite Course: Math 219

Goal: Course Description:

**This course is an introduction to calculus and analytic geometry including limits, continuity of functions, definition of differentiation, derivation of formulas, applications, anti-differentiation and the fundamental theorem of calculus.**

Course Objectives:

- Estimate and evaluate limits of functions
- Apply the Squeeze Theorem and L'Hospital's Rule to solve for limits
- Examine the continuity properties of functions
- Define and interpret the derivative of a function
- Sketch the graphical representation of the derivative
- Derive, memorize and use derivative rules and formulas
- Evaluate derivatives implicitly
- Solve related rates problems
- Use derivative tools to examine local behaviors of functions
- Apply derivative tests and calculus tools to optimize functions
- Solve applied optimization word problems
- Use Newton's Method to find roots
- Recognize and restate the Mean Value Theorems and the Fundamental Theorem of Calculus
- Relate the derivative and integral processes
- Solve simple integrals

Course Outcomes:

**By the end of this course, students will be able to**

- Use functions to interpret the derivative from a numerical, graphical, and symbolic point of view.
- State the Fundamental Theorem of Calculus.
- Compute derivatives numerically, graphically, and symbolically of explicit.
- Apply derivatives to related rates and optimization problems.
- Gain confidence in manipulating functions.

Assessment of the Outcomes: