MATH 110

(GQ) Techniques of Calculus I (4) Functions, graphs, derivatives, integrals, techniques of differentiation and integration, exponentials, improper integrals, applications. Students may take only one course for credit from MATH 110, 140, 140A, and 140B.

Prerequisite: MATH 022 or satisfactory performance on the mathematics proficiency examination

TOPICS

EQUATIONS AND INEQUALITIES
Linear Equations and Inequalities in One Variable
Quadratic Equations

GRAPHICS AND FUNCTIONS
Cartesian Coordinate System and Straight Lines
Functions
Linear and Quadratic Functions

EXPONENTIAL AND LOGARITHMIC FUNCTIONS
Exponential Functions
The Exponential Functions with Base e
Logarithmic Functions

THE DERIVATIVE
Limits and Continuity - A Geometric Introduction
Computation of Limits
The Derivative
Derivatives of Constants, Power Forms and Sums
Derivatives of Products and Quotients
Chain Rule: Power Form
Marginal Analysis in Business and Economics
GRAPHING AND OPTIMIZATION
First Derivative and Graphs
Second Derivative and Graphs
Curve Sketching Techniques
Optimization; Absolute Maxima and Minima
Increments and Differentials

DERIVATIVE TOPICS
The Constant e and Continuous Compound Interest
Derivatives of Logarithmic and Exponential Functions
Chain Rule: General Form
Implicit Differentiation
Related Rates
Some Additional Business Applications

INTEGRATION
Antiderivatives and Indefinite Integrals
Integration by Substitution
Differential Equations - Growth and Decay
Area Under a Curve
The Definite Integral
The Fundamental Theorem of Calculus

INTEGRATION TOPICS
Area Between Curves
Integration by Substitution
Integration by Parts
Integration Using Tables
Improper Integrals