

MATH 231

Calculus of Several Variables (2) Analytic geometry in space; partial differentiation and applications.

Prerequisite: MATH 141. Students who have passed MATH 230 or MATH 230H may not schedule this course.

Topics

Vectors and the Geometry of Space

Three-Dimensional Coordinate Systems

Vectors

The Dot Product

The Cross Product

Equations of Lines and Planes

Cylinders and Quadric Surfaces

Vector Functions

Vector Functions and Space Curves

Derivatives and Integrals of Vector Functions

Arc Length and Curvature

Motion in Space: Velocity and Acceleration

Partial Derivatives

Functions of Several Variables

Limits and Continuity

Partial Derivatives

Tangent Planes and Differentials

The Chain Rule

Directional Derivatives and the Gradient Vector

Maximum and Minimum Values

Lagrange Multipliers