MATH 311 ς CALCULUS III ς SYLLABUS

Department of Mathematics
Millersville University

Description

A continuation of MATH 211. Topics include vector calculus, functions of several real variables, partial differentiation, implicit functions, multiple integrals, line and surface integrals and applications. (4 credits)

This course may be taken for general education credit (G2)

Prerequisites

C- or better in MATH 211

Course Objectives

Students will learn the theory and techniques of calculus and it's applications. By the conclusion of this course the successful student will be able to:

Write vectors in component form and as linear combinations of standard unit vectors.
Add and subtract vectors algebraically and graphically and use in applications.
Calculate dot and cross products of vectors.
Find the angle between vectors, the component and projections of one vector onto another.
Find parametric and symmetric equations of a line in space.
Find the distance between two objects in space.
Identify surfaces in space.
Determine limits, continuity, derivatives, and integrals of vector-valued functions.
Use vectors to solve applied problems involving velocity, force, and work.
Determine the curvature of vector-valued functions.
Find the unit tangent vector, normal vector and binormal vector of a vector-valued function.
Determine the parametric representation of surfaces in space.
Apply calculus techniques to functions of more than one independent variable including limits, partial derivatives, directional derivatives, and the chain rule.
Find the gradient of multivariable functions.
Calculate extrema of multivariable functions.
Calculate double and/or triple integrals and use to find area, volume, and center of mass, and surface area.