



Mathematics 367

University Calculus III

**Calendar Description: H(3-1T-1)**

Functions of several variables; limits, continuity, differentiability, partial differentiation, applications including optimization and Lagrange multipliers. Vector functions, line integrals and surface integrals, Green's theorem, Stokes' theorem. Divergence theorem. Students will complete a project using a computer algebra system..

**Prerequisite(s):** One of Mathematics 267 or 283 or 349 or Applied Mathematics 219; and Mathematics 211 or 213.

**Antirequisite(s):** Credit for more than one of Mathematics 353, 331, 367, 377, 381 or Applied Mathematics 309 will not be allowed.

*Syllabus*

<u>Topics</u>	<u>Number of Hours</u>
Vectors and vector functions	4
Functions of several variables: Differentiation and applications	13
Multiple integration: Change of variables	6
Vector Calculus: line and surface integrals, Green's theorem, Stokes's theorem, divergence theorem	13
<b>TOTAL HOURS</b>	<b>36</b>

See accompanying page for a detailed breakdown of instructional hours.

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VECTORS AND VECTOR FUNCTIONS

Vector functions in $\mathbb{R}^2$ and $\mathbb{R}^3$ , Derivatives and Integrals	(1)
Curve, parametrization	(1)
Application: Motions in space	(1)
Quartic surfaces	(1)

FUNCTIONS OF SEVERAL VARIABLES

Functions of several variables, graph, level curves and surfaces	(1)
Limits and continuity	(2)
Partial derivatives	(1)
Tangent plane and Linear approximation	(1.5)
Chain Rule	(1.5)
Implicit functions	(1)
Directional derivatives and the gradient vector	(1)
Maximum and minimum values	(2)
Lagrange multipliers	(2)

MULTIPLE INTEGRALS

Review of Double Integrals in Rectangular and Polar coordinates	(1)
Triple integral in Rectangular, Cylindrical and Spherical coordinates	(3)
Change of variables, Jacobian	(2)

VECTOR CALCULUS

Vector fields	(1)
Line integrals	(1.5)
Conservative fields, Independence of path	(1.5)
Green's Theorem	(1)
Curl and Divergence	(1)
Parametric surfaces and area	(2)
Surface Integrals	(2)
Stokes' Theorem	(2)
Divergence Theorem	(1)

Total = (36)