Mathematics 277   Multivariable Calculus for Engineers and Scientists

Calendar Description: H(3-1T-1.5)

Calculus of functions of several real variables; differentiation, implicit functions, double and triple integrals; applications; Vector-valued functions; derivatives and integrals; parametric curves.

Prerequisite(s): Mathematics 275 or Applied Mathematics 217; or consent of the Department.

Antirequisite(s): Credit for more than one of Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219 will not be allowed.

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Syllabus

Topics	Number of Hours
Vector functions, curvature and torsion	8
Differentiation of functions of several variables	11
Applications of partial derivatives	6
Multiple integration, change of variables	12
TOTAL HOURS	37

See accompanying page for a detailed breakdown of instructional hours.

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June 13, 2014 Effective: Winter 2015

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MATH 277 Multivariable Calculus for Engineers and Scientists

1. Vector Functions :	
Vector Functions of One variable.	2 Hours
Some Applications of Vector Differentiation (Motion)	2 Hours
Curves and Parametrization,	2 Hours
Curvature and Torsion	2 Hours
2. Partial Differentiation :	
Functions of Several Variables.	1 Hour
Quadric Surfaces	1 Hour
Partial Derivatives.	1.5 Hours
Higher Order Derivatives	1 Hour
The Chain Rule.	1.5 Hours
Linear Approximation , Differentiability , and Differentials.	2 Hours
Gradient , and Directional Derivatives.	1.5 Hours
Implicit Functions.	1.5 Hours
3. Applications of Partial Derivatives :	
Extreme Values.	1 Hour
Extreme Values of Functions Defined on Restricted Domains.	2 Hours
Lagrange Multipliers	2 Hours
The Method of Least Squares.	1 Hour
4. Multiple Integration :	
Double Integrals.	1 Hour
Iteration of Double Integrals in Cartesian Coordinates.	2 Hours
Improper Integrals and a Mean Value Theorem.	1 Hour
Double Integrals in Polar Coordinates.	1 Hour
Triple integrals.	2 Hours
Change of variables in Triple integrals.	2.5 Hours
Applications of Multiple Integrals.	2.5 Hours
	Total: 38 Hours