Math 251 Calculus 3

Credit Hours: 4

Scheduled hours per week

Lecture: 4
Lab: 0
Other: 0

Catalog Course Description: Vector products, linear transformations, matrices and determinants, vector differential calculus, line and surface integrals, double and triple integrals, Green's theorem, Fourier series and integrals.

Pre-requisites: C or better in Math 156

Co-requisites: None

Course Learning Outcomes:

1. Students will demonstrate knowledge and proficiency with vector algebra.
2. Students will demonstrate knowledge and proficiency with vector differential calculus.
3. Students will demonstrate knowledge and proficiency with line and surface integrals.
4. Students will demonstrate knowledge and proficiency with Fourier series and integrals.

Topics to be studied:

Scalars and Vectors Components of a Vector Addition of Vectors,
Multiplication of Vectors by Scalars Vector Spaces
Linear Dependence and Independence Inner Product (Dot product)
Inner Product Spaces
Vector Product (Cross product)
Vector Products in Terms of Components Scalar Triple Product
Other Repeated Products Scalar Fields
Vector Calculus Curves
Arc Length
Tangent, Curvature, Torsion Velocity and Acceleration
Chair Rule and Mean Valve Theorem for Functions of Several Variables Directional Derivative
Gradient of a Scalar Field
Transformation of Coordinate Systems and Vector Components Divergence of a Vector Field
Curl of a Vector Field Line Integral

Relationship of Course to Program or Discipline Learning Outcomes:

(What program outcomes are being met by this course?

Relationship of Course to Mathematics (MATH) Student Learning Outcomes:	
Demonstrate understanding of the language of mathematics, by their use of symbols, definitions, word phrases, and representations.	x
Display proficiency in mathematical computations.	x
Implement mathematical techniques to solve applied problems.	x
Employ appropriate technology to demonstrate knowledge of mathematical concepts.	x
Exhibit mastery of core course competencies.	x
10/20/2017	

Relationship of Course to General Education Learning Outcomes:	
Composition and Rhetoric Students illustrate a fundamental understanding of the best practices of communicating in English and meet the writing standards of their college or program-based communication requirements.	
Science & Technology Students successfully apply systematic methods of analysis to the natural and physical world, understand scientific knowledge as empirical, and refer to data as a basis for conclusions.	
Mathematics & Quantitative Skills Students effectively use quantitative techniques and the practical application of numerical, symbolic, or spatial concepts.	x
Society, Diversity, & Connections Students demonstrate understanding of and a logical ability to successfully analyze human behavior, societal and political organization, or communication.	
Human Inquiry & the Past Students interpret historical events or philosophical perspectives by identifying patterns, applying analytical reasoning, employing methods of critical inquiry, or expanding problem-solving skills.	
The Arts & Creativity Students successfully articulate and apply methods and principles of critical and creative inquiry to the production or analysis of works of art.	
5/3/2016	

Special requirements of the course: None

Additional information: None

Prepared by: Chris Cunningham

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