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
Chain Rule and Mean Value
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?)

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<tr>
<th>Relationship of Course to Mathematics (MATH) Student Learning Outcomes:</th>
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<tr>
<td><strong>Demonstrate understanding</strong> of the language of mathematics, by their use of symbols, definitions, word phrases, and representations.</td>
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<td><strong>Display proficiency</strong> in mathematical computations.</td>
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<td><strong>Implement mathematical techniques</strong> to solve applied problems.</td>
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<td><strong>Employ appropriate technology</strong> to demonstrate knowledge of mathematical concepts.</td>
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<td><strong>Exhibit mastery</strong> of core course competencies.</td>
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Special requirements of the course: None

Additional information: None

Prepared by: Chris Cunningham

Date: 10/20/2017