MATH C280: CALCULUS 3

Item	Value
Top Code	170100 - Mathematics, General
Units	5 Total Units
Hours	90 Total Hours (Lecture Hours 90)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
Local General Education (GE)	• Area 2 Mathematical Concepts and Quantitative Reasoning (CA3)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 2A Math Concepts (2A)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 2A Math Concepts (2A)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B4 Math/Quant.Reasoning (B4)

Course Description

Multivariable calculus including vectors, vector-valued functions, functions of several variables, partial derivatives, multiple integrals, calculus of vector fields, Green's Theorem, Stokes' Theorem, and the Divergence Theorem. PREREQUISITE: MATH C185. Transfer Credit: CSU; UC. C-ID: MATH 230.**C-ID:** MATH 230.

Course Level Student Learning Outcome(s)

1. Apply multiple integrals, principles of differential calculus, and integration to solve problems involving vector fields and calculate partial derivatives.

Course Objectives

- 1. Perform vector operations;
- 2. Determine equations of lines and planes;
- 3. Find the limit of a function at a point;
- 4. Evaluate derivatives;
- 5. Write the equation of a tangent plane at a point;
- 6. Determine differentiability;
- 7. Find local extrema and test for saddle points;
- 8. Solve constraint problems using Lagrange multipliers;
- 9. Compute arc length;
- 10. Find the divergence and curl of a vector field;
- 11. Evaluate two and three dimensional integrals; and
- 12. Apply Green?s, Stokes?, and divergence theorems.

Lecture Content

Vectors and vector operations in two and three dimensions Level curves and surfaces, divergence and curl The gradient vector field; and the change of variables theorem Vector and parametric equations of lines and planes, rectangular equation of a plane Dot, cross, and triple products and projections Differentiability and differentiation including partial derivatives, chain rule, higher-order derivatives, directional derivatives, and the gradient Arc length and curvature; tangent, normal, binormal vectors Vector-valued functions and their derivatives and integrals; finding velocity and acceleration Real-valued functions of several variables, level curves and surfaces Limits, continuity, and properties of limits and continuity Local and global maxima and minima extrema, saddle points, and Lagrange multipliers Vector fields including the gradient vector field and conservative fields Double and triple integrals Applications of multiple integration such as area, volume, center of mass, or moments of inertia Change of variables theorem Integrals in polar, cylindrical, and spherical coordinates Line and surface integrals including parametrically defined surfaces Integrals of real-valued functions over surfaces Divergence and curl Green s, Stokes , and divergence theorems

Method(s) of Instruction

- Lecture (02)
- DE Online Lecture (02X)
- Video one-way (ITV, video) (63)

Instructional Techniques

Deliver lectures of course content. Assign homework and quizzes. Relate material in the course to real life and the outside world. Require participation including student-to-student and student-to-instructor interaction through the use of small-group activities and whole-class discussion. Apply technologies to increase learner motivation such as Scientific and/or Graphing Calculator and computer software such as Wolfram

Reading Assignments

Alpha. Objective Examinations Midterm Exam (comprehensive) Final Exam (comprehensive)

Writing Assignments

MyMathLab online assignments

Out-of-class Assignments

Topics covered and examples from textbook

Demonstration of Critical Thinking

Final Exam Midterm Exam Objective Examinations Problem Solving Exercises Projects (ind/group) Report Short Quizzes Skills Demonstration Written Assignments

Required Writing, Problem Solving, Skills Demonstration

Demonstrate understanding of concepts and provide the appropriate solutions through homework problems, quizzes, and exams in writing.

Eligible Disciplines

Mathematics: Master's degree in mathematics or applied mathematics OR bachelor's degree in either of the above AND master's degree in statistics, physics, or mathematics education OR the equivalent. Master's degree required.

Textbooks Resources

1. Required Briggs, William; Chchran, Lyle; Gillett, Bernard. Calculus; Early Transcendentals, 2nd ed. Pearson, 2015

Other Resources

1. Coastline Library