MATH C140: BUSINESS CALCULUS

Item	Value
Curriculum Committee Approval Date	03/22/2024
Top Code	170100 - Mathematics, General
Units	4 Total Units
Hours	72 Total Hours (Lecture Hours 72)
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

For Business, Management, and Social Science majors. Functions, graphs, limits, continuity, derivatives, and integrals of exponential and logarithmic functions, the Chain Rule, multivariable functions, differential equations, and applications. PREREQUISITE: A course taught at the level of intermediate algebra or appropriate math placement. Transfer Credit: CSU; UC: Credit Limitation: MATH C140 and MATH C180 combined: maximum credit, 1 course. C-ID: MATH 140.**C-ID:** MATH 140.

Course Level Student Learning Outcome(s)

1. Use limits, derivatives, and integrals to apply methods of calculus in business and other real-world applications.

Course Objectives

- 1. Find the limit of a function and intervals on which a function is continuous.
- 2. Find derivatives and integrals for a variety of functions including linear, quadratic, radical, polynomial, rational, exponential, and logarithmic functions and partial derivatives of multivariable functions.
- 3. Use limits, derivatives, and integrals to apply methods used by businesses to calculate revenue, increase profitability, decrease costs, manage inventory, study the environment, make predictions, and use in other real-world applications.

Lecture Content

FUNCTION REVIEW Linear and Absolute Value Functions Non linear Functions Rational and Piecewise Defined Functions Regression and Modeling LIMITS and DERIVATIVES Intuitive Limit Definition of Derivative Continuity Rates of Change and Slope Introduction to the Derivative; Use Derivatives to Tangent Lines Derivatives of Algebraic Functions Product, Quotient, and Chain Rules Higher-Order Derivatives Exponential and Logarithmic Functions Derivatives of Exponential and Logarithmic Functions APPLICATIONS of the DERIVATIVES First Derivative Test and Graphs of Functions Second Derivative Test; Sketch the Graph of Functions Using Horizontal and Vertical Asymptotes, Intercepts, Intervals Where the Function Is Increasing and Decreasing, Maximum and Minimum Values, Intervals of Concavity and Points of Inflection Absolute Extrema Optimization Business Applications Including Analysis of Marginal Cost Implicit Differentiation and Related Rates INTEGRAL and ITS APPLICATIONS Anti-derivatives and Integrals More Rules for Integration Substitution Techniques for Integration Definite Integrals and Area Between Curves Increments, Tangent Lines, Approximating Definite Integral As a Sum Applications of Integration in Business and Economics Find Definite and Indefinite Integrals By Using Integration Techniques Other Than the General Integral Formulas and Integration By Substitution Differential Equations MULTIVARIABLE CALCULUS Introduction to Functions of More than One Variable Partial Derivatives Optimization and LaGrange Multipliers Double Integrals

Method(s) of Instruction

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

Reading Assignments

Readings from textbook and other applicable resources such as current newspapers, magazines and other media.

Writing Assignments

Writing is included as part of the open-ended, free response exam questions on Midterm and Final. Additional writing and research projects may also be assigned.

Out-of-class Assignments

Homework, problem-solving, preparation for class discussions and exams.

Demonstration of Critical Thinking

Through class discussions and through showing detailed work on open-ended questions in the Midterm and Final Exams.

Required Writing, Problem Solving, Skills Demonstration

Included as homework assignments, part of classroom lectures and discussions, part of quizzes, Midterm Examination, Final Examination, and Projects.Students will be able to explain solutions and justify reasoning verbally or in writing and may be included in classroom discussions, quizzes, Midterm Examination, Final Examination, and Projects.

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 Calaway, S.,Hoffman, D., Lippman, D.. Applied Calculus, ed. OpenText, 2024 Rationale: -

Other Resources

1. MyOpenMath, OER 2. Bittinger, Marvin. Calculus and Its Applications, 12th ed. Pearson, 2024 3. MyMathLab access code