Glendale College

Course Outline of Record Report

Course ID 010428

Revision - November 2025

MATH112+ : Calculus for Business with Support

General Information

Author:	• Suzanne Palermo
Attachments:	DE Addendum_MATH_112+_COR_3:26:25_CoDE_5:27:25.pdf
Course Code (CB01) :	MATH112+
Course Title (CB02) :	Calculus for Business with Support
Department:	MATH
Proposal Start:	Fall 2026
TOP Code (CB03) :	(1701.00) Mathematics, General
CIP Code:	(27.0101) Mathematics, General.
SAM Code (CB09) :	E - Non-Occupational
Distance Education Approved:	Yes
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000607060
Curriculum Committee Approval Date:	11/12/2025
Board of Trustees Approval Date:	12/09/2025
Last Cyclical Review Date:	03/26/2025
Course Description and Course Note:	MATH 112+ is a one-semester course in calculus for business, management, and social science majors. This course has a built-in support lab component. Students cover topics that include techniques of differentiating, maximum-minimum problems, curve sketching, derivatives and applications of exponential and logarithmic functions, and techniques of integration.
Justification:	Content Change
Academic Career:	• Credit
Mode of Delivery:	• In-Person • Remote • Hybrid • Proctored Online
Author:	No value
Course Family:	No value

Academic Senate Discipline

Primary Discipline:	• Mathematics
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

GE Status (CSU) B4, (UC) 2

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

Cal-GETC	Area	Status	Approval Date	Comparable Course
Area 2: Mathematical Concepts and Quantitative Reasoning	Mathematical Concepts and Quantitative Reasoning	Approved	09/02/2025	No Comparable Course defined.

GCC General Education Requirements	Area	Status	Approval Date	Comparable Course
Area 2: Mathematical Concepts and Quantitative Reasoning	Mathematical Concepts and Quantitative Reasoning	Approved	09/02/2025	No Comparable Course defined.

Units and Hours

Summary

Minimum Credit Units (CB07)	6
Maximum Credit Units (CB06)	6
Total Course In-Class (Contact) Hours	144
Total Course Out-of-Class Hours	180
Total Student Learning Hours	324

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

☐ Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	5	10
Laboratory Hours	3	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	90
Laboratory	54
Studio	0
Total	144
Course Out-of-Class Hours	
Lecture	180
Laboratory	0
Studio	0
Total	180

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Prerequisites, Corequisites, Recommended Corequisites, and Recommended Preparation

Prerequisite

Placement is based on academic background or satisfactory completion of Intermediate Algebra or the equivalent.

Entry Standards

Entry Standards	Description
No value	No value

Course Limitations

Cross Listed or Equivalent Course	Description
MATH 112 Calculus for Business	No Value

Requisite Validation

Upload Statistical Validation and/or other documents (if necessary)

No Value

Specifications

Methods of Instruction

Methods of Instruction	
Methods of Instruction	Lecture
Methods of Instruction	Discussion
Methods of Instruction	Multimedia
Methods of Instruction	Demonstrations

Out of Class Assignments

- Homework (e.g. problem sets related to course content)
- Group assignments and projects (e.g. analyze a business' profit and loss, analyze supply and demand for a product)
- Computer or graphing calculator assignments

Methods of Evaluation	Description of Activity/Interaction
Exam/Quiz/Test	Quizzes
Exam/Quiz/Test	4 or more examinations are required
Exam/Quiz/Test	A comprehensive final examination is required

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Stefan Waner, Steven Costenoble	Applied Calculus	Cengage	2023	978-0357723487

Other Instructional Materials (i.e. OER, handouts)

Description	Mathematics Division generated materials
Author	No value
Citation	No value
Online Resource(s)	

Learning Outcomes

Course Objectives

Demonstrate understanding of exponents, linear equations and inequalities, and functions.

Differentiate various types of functions by using the product, quotient and chain rules.

Find the derivatives of polynomial, rational, exponential and logarithmic functions.

Use derivatives to find rates of change and tangent lines.

Sketch the graph of functions using horizontal and vertical asymptotes, intercepts, and first and second derivatives to determine intervals where the function is decreasing and increasing, maximum and minimum values, intervals of concavity and points of inflection.

Apply the rules of differentiation to solve optimization problems.

Use calculus to analyze revenue, cost and profit.

Apply the calculus of exponential and logarithmic functions to application problems.

Apply the various techniques of integration to definite, indefinite, and improper integrals by using the general integral formulas, integration by substitution, and other integration techniques.

Analyze the marginal cost, profit and revenue when given the appropriate function.

Use integration in business and economics applications.

SLOs

Find, apply, and interpret graphic, symbolic, numerical/data, and verbal/applied representations of the derivative. Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Use quantitative and/or analytical mathematical skills to solve problems and to interpret, evaluate, and process information and data to draw logical conclusions and support claims.
ST DV Liberal Arts: Science and Mathematics Emphasis A.A. Degree	Apply mathematical and scientific ideas to analyze real-world situations.
MATH Mathematics - A.A. Degree Major	Evaluate limits, derivatives and integrals.
	solve applications in math and science using derivatives, integrals, differential equations and linear algebra.
ILOs General Education	apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues

Find, apply, and interpret graphic, symbolic, numerical/data, and verbal/applied representations of integration. Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Use quantitative and/or analytical mathematical skills to solve problems and to interpret, evaluate, and process information and data to draw logical conclusions and support claims.
ST DV Liberal Arts: Science and Mathematics Emphasis A.A. Degree	Apply mathematical and scientific ideas to analyze real-world situations.
MATH Mathematics - A.A. Degree Major	Evaluate limits, derivatives and integrals.
	solve applications in math and science using derivatives, integrals, differential equations and linear algebra.

ILOs General Education	apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues

Apply calculus to business related application problems. Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Use quantitative and/or analytical mathematical skills to solve problems and to interpret, evaluate, and process information and data to draw logical conclusions and support claims.
ST DV Liberal Arts: Science and Mathematics Emphasis A.A. Degree	Apply mathematical and scientific ideas to analyze real-world situations.
ECON Economics AA-T Degree	Develop a broad and critical understanding of the complex interconnections between the human and environmental forces in their world.
MATH Mathematics - A.A. Degree Major	Evaluate limits, derivatives and integrals.
	solve applications in math and science using derivatives, integrals, differential equations and linear algebra.
ILOs General Education	apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Preliminaries (8 hours)

- Algebra review
- The Cartesian Coordinate System
- Lines

Functions, Limits, and the Derivative (15 hours)

- Functions and their graphs, including exponential and logarithmic functions
- The algebra of functions
- Functions and mathematical models
- Limits and intuitive limit definition of derivative

- One-sided limits and continuity
- Increments, tangent lines and rate of change

Differentiation (15 hours)
- Rules of differentiation, including sum, difference, product and quotient rules
- The chain rule
- Marginal functions in economics
- Higher-order derivatives
- Implicit differentiation and related rates
- Differentials

Applications of the Derivative (16 hours)
- Applications of the first derivative – increasing/decreasing and extrema
- Applications of the second derivative – concavity and points of inflection
- Curve sketching
- Optimization - extreme value theorem
- Optimization – applications

Exponential and Logarithmic Functions (14 hours)
- Exponential functions
- Logarithmic functions
- Compound interest
- Differentiation of exponential functions
- Differentiation of logarithmic functions
- Exponential functions as mathematical models

Integration (15 hours)
- Antiderivatives, indefinite integrals and the rules of integration
- Integration by substitution
- Approximating definite integral as a sum
- Area and the definite integral
- The Fundamental Theorem of Calculus
- Evaluating definite integrals
- Area between two curves
- Applications of the definite integral to business and economics

Additional Topics in Integration (7 hours)
- Integration by parts
- Numerical integration (optional)
- Improper integrals (optional)

Total Hours: 90

Laboratory/Studio Content

Geometry Review (2 hours)
- Perimeter
- Area

Calculator use (2 hours)
Exponents (5 hours)
- Properties
- Rational exponents

Multiplication of polynomials (5 hours)
Factoring polynomials (5 hours)
Rational expressions (5 hours)
- Zero in numerator and/or denominator
- Working with averages
- Difference quotients

Equations (5 hours)
- Rational equations
- Exponential equations

Inequalities (5 hours)
- Linear

- Non-linear

Radicals (5 hours)
Functions (5 hours)
- Function notation
- Domain and range
- Graphing
- Linear functions
- Polynomial and rational functions
- Exponential and log functions

Systems of linear equations (5 hours)
Problem solving strategies (5 hours)

Total Hours: 54

Additional Information

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Is it possible this course will have a material fee?

No

I have contacted my library liaison (https://campusguides.glendale.edu/faculty/liaisons):

No

What term(s) will this course be offered?

Fall/Winter/Spring/Summer

Will any additional resources be needed for this course? (Click all that apply)

- No

If additional resources are needed, add a brief description and cost in the box provided.

No Value