MATH-87: SUPPORT FOR APPLIED CALCULUS

Effective Term
Fall 2026

CC Approval
11/07/2025

AS Approval
11/13/2025

BOT Approval
11/20/2025

SECTION A - Course Data Elements

CB04 Credit Status
Credit - Degree Applicable

Discipline

Minimum Qualifications	And/Or
Mathematics (Master's Degree)	

Subject Code
MATH - Mathematics
Course Number
87

Department
Mathematics

Division
Mathematics (MATH)

Full Course Title
Support for Applied Calculus

Short Title
Support for Applied Calculus

CB03 TOP Code
1702.00 - Mathematics Skills

CB08 Basic Skills Status
BS - Basic Skills

CB21 Prior Transfer Level
A - One level below transfer

CB09 SAM Code
E - Non-Occupational

Rationale
Adjustment to instructional method to eliminate dangling hours.

SECTION B - Course Description

Catalog Course Description
This course is intended for students who are almost ready to succeed in Applied Calculus and for whom the just-in-time remediation will provide a foundation for success. Topics including functions, solving equations, graphing and simplifying expressions will be covered as needed.

SECTION C - Conditions on Enrollment

Open Entry/Open Exit
No

Repeatability
Not Repeatable

Grading Options
Pass/No Pass Only

Allow Audit
Yes

Requisites

Corequisite(s)
Concurrent enrollment in MATH-115 or equivalent.

Requisite Justification

Requisite Description
Course Not in a Sequence

Subject
MATH
Course #
115

Level of Scrutiny
Requisite Established by Statute/Regulation

Explanation
Established by the Ed Code 78213(k)(1) in association with AB1705 legislature.

SECTION D - Course Standards

Is this course variable unit?
No

Units
1

Lab Hours
54

Activity Hours
0

Outside of Class Hours
0

Total Contact Hours
54

Total Student Hours
54

Distance Education Approval

Is this course offered through Distance Education?
Yes

Online Delivery Methods

DE Modalities	Permanent or Emergency Only?
Entirely Online	Permanent
Hybrid	Permanent
Online with Proctored Exams	Permanent

SECTION E - Course Content

Student Learning Outcomes

	Upon satisfactory completion of the course, students will be able to:
1.	Graph functions.
2.	Solve equations.
3.	Simplify expressions.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1.	Solve polynomial, rational, absolute value, radical, exponential and logarithmic equations.
2.	Solve systems of linear equations.
3.	Graph linear and nonlinear functions.
4.	Perform algebraic operations with functions, including function composition.
5.	Find inverse functions.
6.	Use mathematical modeling to solve problems relating to exponential growth, and decay, mixing, and optimization.
7.	Use function notation and evaluate domain and range for all functions types studied.
8.	Simplify difference quotients involving polynomial, rational, and radical functions.
9.	Study for a math class effectively.

Course Content

Using a just-in-time approach, the following content will be covered as required for success in the corequisite Applied Calculus course.

1. Linear equations and inequalities
   a. Linear functions (finding and graphing)
   b. Graphing linear inequalities
2. Graphing linear equations
   a. Equations in two variables
   b. Slope and graphing
   c. Using slope-intercept and point-slope formulas
   d. Horizontal and vertical lines
   e. Parallel and perpendicular lines
3. Systems of equations
   a. Solving systems of two equations with two unknowns (graphing, substitution, elimination)
   b. Applications of systems
   c. Solving systems of three equations with three unknowns
4. Exponents and polynomials

a. Review of order of operations
b. Review exponent rules
c. Negative exponents
d. Scientific notation (including arithmetic operations)
e. Addition and subtraction of polynomials with several variables
f. Multiplying polynomials (including special products and several variables)
g. Dividing polynomials (including long division)
h. Factoring polynomials (grouping, binomials, trinomials)
i. Solving polynomial equations by factoring

5. Rational expressions and equations
   a. Rational expressions and functions (including domain)
   b. Multiplication and division
   c. Adding and subtracting with common and uncommon denominators
   d. Complex fractions
   e. Proportions and dimensional analysis
   f. Solving rational equations
6. Radical expressions and equations
   a. Roots and radical notation with rational exponents
   b. Simplifying radicals and radical expressions
   c. Adding and subtracting
   d. Multiplying and dividing
   e. Solving radical equations
   f. Radical functions
   g. Complex numbers
7. Quadratics
   a. Solving by factoring, square root property, completing the square and quadratic formula
   b. Quadratic functions and graphs
   c. Finding maximums and/or minimums
8. Functions
   a. Function notation
   b. Analyzing the graphs of functions
   c. Composition of functions
   d. Evaluating piecewise defined functions from equation and graph
   e. Domain and range
9. Logarithms and exponentials
   a. Inverse functions (including domain and range)
   b. Exponential functions and their graphs (including domain and range)
   c. Logarithmic functions and their graphs (including domain and range)
   d. Properties of logarithms
   e. Solving logarithmic and exponential equations
   f. Applications including growth, decay and interest
10. Study skills / affective domain (this should be integrated into the class, not taught as a separate section)
    a. Growth mindset
    b. How to study for a math class
    c. Test taking strategies
    d. Campus resources

Methods of Instruction

Methods of Instruction

Types	Examples of learning activities
Discussion	Discussion of class topics.
Directed Study	Study of class topics.
Group Work	Group work.
Individualized Instruction	Individualized instruction to fill gaps.
Other	Practice Problems.

Online Adaptation

Types	Examples of learning activities
Discussion	Discussion of class topics.
Directed Study	Study of class topics.
Group Work	Group work.
Individualized Instruction	Individual instruction to fill gaps.
Other	Practice Problems.

Instructor-Initiated Online Contact Types

Announcements/Bulletin Boards
Discussion Boards
E-mail Communication
Video or Teleconferencing

Student-Initiated Online Contact Types

Discussions
Group Work

Course design is accessible

Yes

Methods of Evaluation

Methods of Evaluation

Types	Examples of classroom assessments
Class Participation	Participation in class activities.
Oral Presentations	Presentations of sample problems.
Problem Solving	Practice solving problems.
Skills Demonstration	Demonstrate skills needed to succeed in Applied Calculus.
Other	It is recommended that half hour a week in the Math Success Center be assigned as a homework assignment worth 3 - 5% of the semester grade.
Homework	Homework problems.
Other	The Mathematics Department maintains a commitment to diverse teaching methods in courses emphasizing vital quantitative skills and qualitative reasoning ability. To that end, it is expected that sufficient formative assessments will be given to students that in frequency, length and rigor adequately assess both quantitative skills and qualitative reasoning.

Assignments

Reading Assignments

Example 1) Read the section on maximum/minimum function values before our next class period and be prepared to do an in class activity.
Example 2) Read the section on the derivative before our next class period and be prepared to do an in class activity.

Writing Assignments

Example 1) Complete assigned exercises from the applicable section in the text.
Example 2) Given a quadratic equation, work with a group to find all the zeros, the maximum or minimum value, and at least two other points, then graph.

Outside-of-Class Assignments

Other assignments as needed.

SECTION F - Textbooks and Instructional Materials

Material Type

Textbook

Author
Bittinger, Ellenbogen, Surgent

Title
Calculus and Its Applications Brief Version

Edition/Version
12th

Publisher
Pearson

Year
2020

Rationale
This is a standard Applied Calculus book.

ISBN #
9780136880257

SECTION G - Diversity, Equity and Inclusivity

How does your course and/or course outline of record reflect strategies for accommodating and engaging diverse student populations, advancing equitable outcomes, and fostering inclusion for all students?

This course uses Open Educational Resources (OER) which reflects a strategic commitment to equity, inclusion, and student success. By removing the financial barrier of costly textbooks, OER ensures that all students—regardless of socioeconomic background—have immediate and sustained access to course materials, supporting more equitable academic outcomes. OER also enhances accessibility by offering content in multiple, adaptable formats that can accommodate diverse learning needs, including those of students with disabilities. Furthermore, the flexibility of OER allows faculty to customize instructional materials to include culturally relevant examples and interdisciplinary applications, making the curriculum more inclusive and reflective of the diverse student population. This adaptability supports varied teaching approaches and promotes student engagement by connecting calculus concepts to real-world contexts that resonate with students' academic and career goals.

Course Codes (Admin Only)

Allow Pass/No Pass
Yes

Only Pass/No Pass
No