

CATALOG INFORMATION

Dept and Nbr: MATH 16 Title: INTRO TO MATH ANALYSIS
Full Title: Introduction to Mathematical Analysis
Last Reviewed: 1/9/2024

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	4.00	17.5	Lecture Scheduled	70.00
Minimum	4.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 140.00

Total Student Learning Hours: 210.00

Title 5 Category: AA Degree Applicable
Grading: Grade or P/NP
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly:

Catalog Description:
Exponential and logarithmic functions, limits, differential and integral calculus with applications, partial derivatives, and calculator techniques. Emphasis on applications in business and economics.

Prerequisites/Corequisites:
Completion of MATH 154 or higher (VE)

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Exponential and logarithmic functions, limits, differential and integral calculus with applications, partial derivatives, and calculator techniques. Emphasis on applications in business and economics. (Grade or P/NP)
Prerequisites/Corequisites: Completion of MATH 154 or higher (VE)
Recommended:
Limits on Enrollment:

Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area		Effective:	Inactive:
	B	Communication and Analytical Thinking	Fall 1981	
CSU GE:	MC	Math Competency		
	Transfer Area		Effective:	Inactive:
	B4	Math/Quantitative Reasoning	Fall 1981	
IGETC:	Transfer Area		Effective:	Inactive:
	2A	Mathematical Concepts & Quantitative Reasoning	Fall 1981	
CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:

CID:

CID Descriptor:MATH 140 Business Calculus
SRJC Equivalent Course(s): MATH16

Certificate/Major Applicable:

Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:

Upon successful completion of the course, students will be able to:

1. Perform advanced operations with functions (using symbolic, graphical, and numerical representations) and apply knowledge to modeling problems.
2. Define and graph inverse functions.
3. Recognize and describe the characteristics of polynomial, rational, algebraic, exponential and logarithmic functions, and utilize these in graphing the functions.
4. Solve equations graphically and algebraically.
5. Calculate limits and use limit notation.
6. Define the derivative and calculate derivatives of polynomial, rational, algebraic, exponential, and logarithmic functions.
7. Use techniques of differentiation, including product, quotient and chain rules.
8. Use derivatives as an aid to graphing, in optimization problems, and to analyze business and economic applications.
9. Calculate antiderivatives.
10. Evaluate definite integrals using the fundamental theorem of calculus.
11. Use partial differentiation and the method of LaGrange multipliers in optimization problems.

Topics and Scope:

- I. Functions
 - A. Symbolic, graphical, and numerical representations
 - B. Operations and composition

- C. Inverse functions
- D. Modeling with functions
- II. Graphs of functions
 - A. Definition and characteristics
 - B. Graphical and algebraic solutions and numerical solutions of equations
 - C. Graphs of polynomial, rational, algebraic, exponential and logarithmic functions
 - D. Graphs of inverse functions
- III. Differential calculus
 - A. Limits of functions
 - B. Increments, tangent lines, and rate of change
 - C. Derivatives (including exponential and logarithmic functions)
 - D. Techniques of differentiation (including sum, product, quotient, and chain rules, and implicit differentiation.)
 - E. Applications of the derivatives (including marginal analysis, optimization, and curve sketching)
 - F. Antiderivatives
- IV. Integral calculus
 - A. Definite and indefinite integrals and the fundamental theorem of calculus
 - B. Integration by substitution
 - C. Tables of integrals
 - D. Applications of integration (area between curves, and applications to business and economics)
 - E. Approximations to the definite integral
- V. Multivariable calculus
 - A. Multivariable functions
 - B. Partial differentiation
 - C. Relative max/min in two variables
 - D. LaGrange multipliers

Assignment:

1. Reading outside of class (0-50 pages per week)
2. Homework problem sets (10-30)
3. Exams (3-7) and quizzes (0-30)
4. Projects (e.g. computer exploration or game analysis) (0-2)

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing
0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problem sets	Problem solving 5 - 20%
Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.	
None	Skill Demonstrations 0 - 0%
Exams: All forms of formal testing, other than skill performance exams.	
Objective exams and quizzes	Exams 70 - 95%
Other: Includes any assessment tools that do not logically fit into the above categories.	
Projects	Other Category 0 - 10%

Representative Textbooks and Materials:

Calculus With Applications (10th ed.). Lial, Margaret; Greenwell, Raymond; Ritchey, Nathan. Pearson 2011.

Calculus And Its Applications (13th ed). Goldstein, Larry; Lay, David; Schneider, David. Pearson 2013.