MATH 16 Course Outline as of Fall 2006

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	17.5	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 in one variable with applications, partial derivatives, and calculator techniques. Emphasis on applications in business and economics.

Prerequisites/Corequisites:
Completion of MATH 155 or higher (VE) OR Completion of MATH 155 or higher (VF)

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Exponential and logarithmic functions, limits, differential and integral calculus in one variable with applications, partial derivatives, and calculator techniques. Emphasis on applications in business and economics. (Grade or P/NP)
Prerequisites/Corequisites: Completion of MATH 155 or higher (VE) OR Completion of MATH 155 or higher (VF)
Recommended:

Limits on Enrollment:
Transfer Credit: CSU;UC. (CAN MATH34)
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	
	MC	Math Competency		
CSU GE:	**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, describe and utilize in graphing the characteristics of polynomial, rational, algebraic, exponential and logarithmic 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. Calculate limits and use limit notation with multivariable functions.

12. Use partial differentiation and the method of LaGrange multipliers in optimization problems.

Topics and Scope:

Instructional methodology may include, but is not limited to: lecture, demonstrations, oral recitation, discussion, supervised practice, independent study, outside project or other assignments.

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 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. Derivatives (Including Exponential and Logarithmic Functions)
   C. Techniques of Differentiation (Including Product, Quotient, and
      Chain Rules)
   D. Applications of the Derivatives (Including Optimization)
   E. Antiderivatives
IV. Integral Calculus
   A. The Fundamental Theorem of Calculus
   B. Integration by Substitution
   C. Tables of Integrals
   D. Applications of Integration
V.   Multivariable Calculus
   A. Multivariable Functions and Limits
   B. Partial Differentiation
   C. Relative Max/Min in Two Variables
   D. Lagrange Multipliers

Assignment:

1. Daily reading outside of class (approximately 0-50 pages per week).
2. Problem set assignments from required text(s)or supplementary materials
   chosen by the instructor.
3. Exams and quizzes.
4. Projects.

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 problems	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.

Multiple choice, Projects (eg, computer explor. or game analysis)	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:
Text(s) required of each student will be selected by the department,
a committee of the department, or the responsible instructor from the
books currently available. Representative texts include:
Calculus With Applications (8th ed.). Lial, Margaret; Greenwell, Raymond;
Ritchey, Nathan. Addison Wesley: 2005.
Calculus And Its Applications (8th ed.). Goldstein, Larry; Lay, David;
Schneider, David. Prentice Hall (10th ed.).