

**MATH 8A Course Outline as of Fall 2006****CATALOG INFORMATION**

Dept and Nbr: MATH 8A      Title: BRIEF CALCULUS 1  
 Full Title: Brief Calculus 1  
 Last Reviewed: 4/19/2010

Units	Course Hours per Week		Nbr of Weeks		Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

Limits, continuity, differentiation, analytic geometry, maxima and minima, rates of change and differentials, integration, calculus for exponential and logarithmic functions, calculus of the trigonometric functions, applications and calculator techniques. The 8A/8B sequence constitutes a complete Brief Calculus course and is intended for students majoring in the life or social sciences. Students will not receive credit for both Math 8A and Math 1A.

**Prerequisites/Corequisites:**

Completion of MATH 27 or higher (VF) OR Course Completion or Current Enrollment in MATH 27 ( or MATH 57)

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: Limits, continuity, differentiation, analytic geometry, maxima and minima, rates of change and differentials, integration, calculus for exponential and logarithmic functions, calculus of the trigonometric functions, applications and calculator techniques. For life or social science

majors. Students will not receive credit for both Math 8A and Math 1A (Grade Only)

Prerequisites/Corequisites: Completion of MATH 27 or higher (VF) OR Course Completion or Current Enrollment in MATH 27 ( or MATH 57)

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;UC. (CAN MATH30)(MATH 8A+MATH 8B=MATH SEQ D)

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

### **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	B	Communication and Analytical Thinking	Spring 1992	Fall 2013
	MC	Math Competency		
<b>CSU GE:</b>	<b>Transfer Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	B4	Math/Quantitative Reasoning	Fall 1992	Fall 2013
<b>IGETC:</b>	<b>Transfer Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	2A	Mathematical Concepts & Quantitative Reasoning	Fall 1993	Fall 2013
<b>CSU Transfer:</b>	Transferable		<b>Effective:</b> Spring 1992	<b>Inactive:</b> Fall 2013
<b>UC Transfer:</b>	Transferable		<b>Effective:</b> Spring 1992	<b>Inactive:</b> Fall 2013

### **CID:**

### **Certificate/Major Applicable:**

Major Applicable Course

### **COURSE CONTENT**

#### **Outcomes and Objectives:**

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

1. Calculate limits and use limit notation.
2. Determine derivatives of polynomial, rational, algebraic, exponential, and logarithmic functions.
3. Use techniques of differentiation, including product, quotient, and chain rules to determine derivatives.
4. Use derivatives to solve and analyze graphing, optimization, and science applications.
5. Determine antiderivatives of polynomial, rational, algebraic, exponential and logarithmic functions.
6. Evaluate definite integrals using the fundamental theorem of calculus.
7. Apply definite integration to compute area, volume, arc length, and to solve problems in life sciences, economics and related fields.
8. Find derivatives and integrals of trigonometric functions.

#### **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. Precalculus

- A. Real number line and order
- B. Absolute value
- C. Exponents and radicals
- D. Polynomials
- E. Rational expressions
- F. Functions and graphs
- G. Limits and continuity
- H. Slope
- I. Distance

#### II. The Derivative

- A. Slope of a curve
- B. Rates of change
- C. Chain rule
- D. Higher order derivatives
- E. Implicit differentiation
- F. Differentiation of algebraic, logarithmic and exponential functions
- G. Applications of the first and second derivative
  - 1. Curve sketching
  - 2. Optimization problems
  - 3. Related rates
  - 4. Differentials

#### III. The Integral

- A. Antiderivatives and indefinite integrals
- B. Definite integral as limit of sum
- C. Integration of algebraic, logarithmic and exponential functions
- D. Midpoint rule for approximating definite integrals
- E. Integration by substitution
- F. Applications of the definite integral
  - 1. Area
  - 2. Volume
  - 3. Marginal analysis

#### IV. Trigonometric Functions

- A. Trigonometric functions and their graphs
- B. Derivative and Integral formulas for the trigonometric functions

#### **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. Among the choices could be:

Brief Calculus With Applications (6th ed.). Larson, Ron; Hostetler, Robert; Edwards, Bruce. Houghton-Mifflin: 2003.