

CATALOG INFORMATION

Dept and Nbr: MATH 71 Title: CALCULUS ENRICHMENT
Full Title: Calculus Problem Solving Enrichment
Last Reviewed: 4/8/2013

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	1.00	Lecture Scheduled	0.50	17.5	Lecture Scheduled	8.75
Minimum	1.00	Lab Scheduled	1.50	17.5	Lab Scheduled	26.25
		Contact DHR	0		Contact DHR	0
		Contact Total	2.00		Contact Total	35.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 17.50

Total Student Learning Hours: 52.50

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:
Critical thinking for mathematics using first-semester calculus concepts: cooperative learning/study techniques, concept development and use of technology.

Prerequisites/Corequisites:
Concurrent Enrollment in MATH 1A

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Critical thinking for mathematics using first-semester calculus concepts: cooperative learning/study techniques, concept development and use of technology. (Grade or P/NP)
Prerequisites/Corequisites: Concurrent Enrollment in MATH 1A
Recommended:
Limits on Enrollment:
Transfer Credit: CSU;

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

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area			Effective:	Inactive:
CSU GE:	Transfer Area			Effective:	Inactive:
IGETC:	Transfer Area			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Fall 2003	Inactive:	Fall 2019
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:

Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:

Upon completion of course, students will be able to:

1. Apply critical thinking skills to the topics in first semester calculus: limits and continuity, the derivative, applications of the derivative, the integral, applications of the integral, methods of evaluation
2. Discuss non-routine and open-ended calculus problems in collaborative teams, verbalizing concepts and solution strategies and constructing written solutions
3. Compare and contrast different approaches to problems, debating the relative merit of each method
4. Use technology to solve problems
5. Develop collaborative working relationships with other students
6. Select an appropriate problem solving strategy for a given situation
7. Adapt general problem solving techniques to specific applications
8. Judge different forms of solutions as being equivalent
9. Organize a portfolio of problem-solving situations and related solutions

Topics and Scope:

I. Limits

- A. Graphical & numerical approaches
- B. Symbolic/algebraic approaches and limit laws

II. Derivatives

- A. Average vs. instantaneous rate of change
- B. Limit definition of derivative
- C. Derivative from graphs and tables
- D. Derivative of functions (polynomial, exponential, logarithmic, trigonometric)

- E. Derivative theorems (sum, difference, product, quotient, chain rules)
- F. Higher order and implicit derivatives
- III. Applications of derivatives
 - A. Optimization
 - B. Related rates
 - C. Curve sketching
 - D. Mean Value Theorem
- IV. Integrals
 - A. Antiderivatives
 - B. Definite integrals
 - C. Fundamental Theorem of Calculus
 - D. Techniques of integration: substitution, parts, partial fractions, tables & Computer Algebra System (CAS)
- V. Applications of integrals
 - A. Area
 - B. Volume
 - C. Physics and economics applications

Assignment:

1. Homework problem sets (5-16)
2. Oral and written presentations of mathematical problems and solutions (5-16)
3. Portfolio (0-1) of assignment sets and solutions
4. Oral and written tests (0-5)

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; oral and written presentations

Problem solving
60 - 100%

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 examinations (multiple choice, true/false, matching items, completion)

Exams
0 - 20%

Other: Includes any assessment tools that do not logically fit into the above categories.

Portfolio of assignments

Other Category
0 - 20%

Representative Textbooks and Materials:
Instructor prepared materials