I. GENERAL DESCRIPTION
A. Approval Date       November 2010
B. Department          Mathematics
C. Course Number       MATH 70
D. Course Title         Math for Liberal Arts Students
E. Course Outline Preparer(s)    John Verosky, Ulf Wostner
F. Department Chair     Amy McLanahan
G. Dean                David Yee

II. COURSE SPECIFICS
A. Hours               Lecture: 3 weekly (52.5 total)
B. Units               3
C. Prerequisites       MATH 860 or placement into MATH 70
                      Corequisites        None
                      Advisories          None
D. Course Justification
                      This course satisfies the CSU Quantitative
                      Reasoning transfer requirement. Its goal is
                      to increase numeracy in students with
                      non-technical goals and to show students the
                      world of math beyond algebra.
                      No
F. Method of Grading   Letter
G. Repeatability       0

III. CATALOG DESCRIPTION
Concepts of mathematics for students with nontechnical goals. Topics include problem solving, set theory, logic, number theory, modeling with functions, geometry, finance, combinatorics, probability, and the role of mathematics in modern society.

IV. MAJOR LEARNING OUTCOMES
Upon completion of this course a student will be able to:
A. Solve mathematical and real world problems using a variety of strategies.
B. Describe sets, perform operations on sets, and establish cardinality of sets.
C. Represent numerals in different numeration systems and use prime factorization and modular arithmetic to solve number problems.
D. Use linear and exponential mathematical models to solve real world problems.
E. Measure length, area, and volume of physical objects justifying procedures by reference to the axiomatic framework of geometry.
F. Apply formulas for interest, annuities, and amortization to solve financial problems.
G. Compute probabilities of events by applying techniques of counting.
V. CONTENTS
A. Problem Solving Strategies
   1. Identifying patterns
   2. Guessing and checking
   3. Drawing pictures
   4. Solving a simpler version
   5. Solving a more general version
B. Sets
   1. Ways of describing sets
   2. Subsets and Venn diagrams
   3. Set operations
   4. Countability
C. Logic
   1. Logical connectives, statements, and quantifiers
   2. Equivalent statements
   3. Paragraph style proofs for example, the square root of 2 is irrational, there are infinitely many primes, the set of rational numbers is countable
   4. Inductive reasoning (optional)
D. Number Theory
   1. Different base systems and place value
   2. Prime numbers
   3. Modular arithmetic
E. Models from Basic Functions
   1. Linear models
   2. Exponential models
   3. Logarithmic models
F. Geometry
   1. The axiomatic method of Euclidean geometry
   2. Triangles
   3. Perimeter and area
   4. Volume and surface area
   5. Fractals (optional)
   6. Non-Euclidean geometry (optional)
G. The Mathematics of Finance
   1. Simple interest
   2. Compound interest
   3. Annuities and savings
   4. Amortization and loans
H. Combinatorics and Probability
   1. Counting, permutations, and combinations
   2. Relative frequency interpretation of probability
   3. Laws of probability
   4. Expected value of random variables (optional)

VI. INSTRUCTIONAL METHODOLOGY
A. Assignments
1. In-class discussion or small group work appropriate to the day's lesson
2. Regular reading assignments for the material being covered in class
3. Regular homework that provides each student with review and practice on the topics and procedures taught such as solving problems using a variety of strategies, enumerating sets, proving results about integers, computing areas and volumes of geometric objects, using financial formulas, and determining probabilities

B. Evaluation
1. Regular homework providing an assessment of each student's efforts to learn about problem-solving strategies, sets, proofs, number theory, functions, geometry, finance, and probability
2. Periodic tests and quizzes that assess each student's proficiency in solving problems such as those involving sets, number theory, geometry, finance, and probability of events
3. Final examination that assesses each student's proficiency in key course topics such as problem-solving, set theory, reading and writing proofs, number theory, modeling with functions, geometry, finance, and probability

C. Textbooks and other instructional materials
1. Textbook
   b. See the Mathematics Department's textbook list for the current textbook.
2. Other Instructional Materials
   a. A scientific calculator
   b. Instructor developed course materials, for example supplementary exercises or notes expanding on a topic, and web pages

VII. TITLE 5 CLASSIFICATION
CREDIT/DEGREE APPLICABLE (meets all standards of Title 5. Section 55002(a)).