



# COURSE OUTLINE OF RECORD

Number: MATH A104

TITLE: Mathematics for Elementary Teachers

**ORIGINATOR:** Tab Livingston

**EFF TERM:** Fall 2015

**FORMERLY KNOWN AS:**

**DATE OF**

**OUTLINE/REVIEW:** 03-02-2016

**CROSS LISTED COURSE:**

**TOP NO:** 1701.00

**CID:**

**SEMESTER UNITS:** 3.0

**HRS LEC:** 54.0

**HRS LAB:** 0.0

**HRS OTHER:** 0.0

**CONTACT HRS TOTAL:** 54.0

**STUDY/NON-CONTACT HRS RECOMMENDED:** 108.0

## CATALOG DESCRIPTION:

Designed for prospective elementary school teachers, the course emphasizes mathematical structure and problem solving techniques associated with the real number system, elementary number theory, ratio and proportion, set theory, elementary logic and percent. Instructional delivery design techniques and technological applications will be explored.

## JUSTIFICATION FOR COURSE:

State teachers licensing and/or certification

## PREREQUISITES:

- MATH A030: Intermediate Algebra with a minimum grade of C or better  
or
- Appropriate OCC mathematics placement score. See Mathematics Assessment Requirement.

## COREQUISITES:

## ADVISORIES:

- MATH A020: Plane Geometry

## ASSIGNED DISCIPLINES:

**MATERIAL FEE:** Yes [ ] No [X] Amount: \$0.00

**CREDIT STATUS:** Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]

**GRADING POLICY:** Pass/No Pass [X] Standard Letter [X] Not Graded [ ]

**OPEN ENTRY/OPEN EXIT:** Yes [ ] No [X]

**TRANSFER STATUS:** CSU Transferable[ ] UC/CSU Transferable[X] Not Transferable[ ]

**BASIC SKILLS STATUS:** Yes [ ] No [X] **LEVELS BELOW TRANSFER:** Not Applicable

**CALIFORNIA CLASSIFICATION CODES:** Y - Not Applicable

**NON CREDIT COURSE CATEGORY:** Y - Not applicable, Credit Course

**OCCUPATIONAL (SAM) CODE:** E

**REPEATABLE ACCORDING TO STATE GUIDELINES:** No [X] Yes [ ] **NUMBER REPEATS:**

**REQUIRED FOR DEGREE OR CERTIFICATE:** No [ ] Yes [X]

Elementary Teacher Education(Associate in Arts for Transfer)

## GE AND TRANSFER REQUIREMENTS MET:

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

2A: Mathematic

CSU GE Area B: Scientific Inquiry and Quantitative Reasoning

B4 - Mathematics/Quantitative Thinking

OCC AA Gen Ed

AREA A2: LANGUAGE AND RATIONALITY - Communication and Analytical Thinking

OCC AS Gen Ed

AREA A2 – ENGLISH COMMUNICATION - Communication and Analytical Thinking

**COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:**

1. Illustrate mathematical ideas through use of manipulatives, models, verbal explanation and written representation.
2. Apply mathematical thinking and modeling to solve problems.
3. Work cooperatively, explore, discover, make conjectures and formulate conclusions based upon mathematical concepts.

**COURSE OBJECTIVES:**

1. Formulate and solve applied problems using whole numbers, integers, fractions, decimals, percents and real numbers by applying a recognized problem-solving process.
2. Solve simple linear equations and inequalities.
3. Demonstrate and explain computational algorithms and problem solving techniques to elementary school students.
4. Evaluate and utilize manipulatives which emphasize mathematical concepts.
5. Apply elementary set theory to categorization problems.
6. Verbalize conclusions arising from the recognition and exploration of mathematical patterns.
7. Develop properties and computational algorithms for numeration systems with nonstandard bases.
8. Apply elementary number theory to find prime numbers, factorizations, divisors and multiples.

**COURSE CONTENT:**

**LECTURE CONTENT:**

Each of these topics is presented in terms of how and why to explain concepts to elementary school students. While the emphasis is on content, there will also be demonstrations of ways to present topics. Students may be required to observe an elementary school math class, interview an elementary school teacher, read and summarize articles in mathematics teaching journals, design mathematics manipulative, and/or prepare and present a classroom lesson designed for elementary students.

- A. Introduction to Problem Solving
  1. Polya's four-step problem-solving process
  2. pattern exploration
  3. the calculator as a problem-solving tool
- B. Sets, Functions, Logic
  1. set operations
  2. Venn diagrams
  3. relations and functions
  4. truth tables
  5. conditional statements
- C. Numeration System and Whole Numbers
  1. whole number operations
  2. algorithms
  3. estimation techniques
  4. number bases
- D. Integers
  1. operations with integers
  2. solving equations

- 3. solving inequalities
- E. Number theory
  - 1. divisibility tests
  - 2. prime and composite numbers
  - 3. greatest common divisor
  - 4. least common multiple
- F. Rational Numbers
  - 1. rational number operations
  - 2. ratio and proportion
- G. Decimals
  - 1. decimal operations
  - 2. percents
  - 3. real number system composition

**LABORATORY CONTENT:**

See Course Content

**METHODS OF INSTRUCTION:**

- A. Lecture:
- B. Lab:
- C. Independent Study:

**INSTRUCTIONAL TECHNIQUES:**

Although the primary instructional mode is the lecture/demonstration method emphasizing approaches to problem solving and the attendant classroom presentation strategies for elementary school students, significant class time is reserved for student discussion and group exercises. When student oral presentation is appropriate, both instructor and peer feedback are elicited.

**COURSE ASSIGNMENTS:**

**Reading Assignments**

Assigned from textbook 1 hour

**Out-of-class Assignments**

Optional lesson plans, peer feedback, game/manipulative design, and planned presentations all require written justification and rationale. 4 hour

**Writing Assignments**

Writing is required on essay test questions, journal article summaries, and interview/observation reports. 1 hour

**METHODS OF STUDENT EVALUATION:**

- Midterm Exam
- Final Exam
- Short Quizzes
- Written Assignments
- Essay Examinations
- Report
- Projects (ind/group)
- Oral Presentations

**Demonstration of Critical Thinking:**

Grades are determined by student performance on unit tests which evaluate problem-solving techniques as well as written responses to essay questions; a comprehensive final exam whose structure is similar to that of the unit test; written reports which may include journal article summaries, interviews and/or classroom observations. In addition, evaluations may include classroom presentation performance as

well as peer evaluation.

**Required Writing, Problem Solving, Skills Demonstration:**

Writing is required on essay test questions, journal article summaries, and interview/observation reports

**TEXTS, READINGS, AND RESOURCES:**

**TextBooks:**

1. Long, Calvin T. and DeTemple, Duane W. . *Mathematical Reasoning for Elementary Teachers*, 6TH ed. New York: Addison Wesley, 2011

**Other:**

1. Other appropriate textbook as chosen by faculty.

**LIBRARY:**

**Adequate library resources include:** Print Materials

Non-Print Materials

Online Materials

Services

**Comments:**

**Attachments:**

[Attached Files](#)