

Lassen Community College Course Outline

MATH-11A Concepts of Elementary School Mathematics I

3.0 Units

I. Catalog Description

A course focusing on the development of quantitative reasoning skills through in-depth, integrated exploration of topics in mathematics, including real number systems and subsystems. Emphasis is on comprehension and analysis of mathematical concepts and applications of logical reasoning. One of two courses designed especially for students preparing for credentials in elementary education. This course has been approved for online, hybrid, web-enhanced and correspondence delivery. This course has been approved to be web-enhanced. Access to a computer with internet access is required.

Prerequisite(s): Math 60, with a grade of (C) or better or the equivalent multiple measures placement.

Prerequisite Skills: Before entering this course the student will be able to:

1. Solve rational expressions and inequalities.
2. Determine the equation of a straight line.
3. Solve radical equations.
4. Transform nonlinear functions into linear functions
5. Manipulate and solve logarithmic and exponential functions.

Transfers to both UC/CSU

General Education Area: D2

CSU GE Area: B4

C-ID MATH 120

51 Hours Lecture, 102 Hours Expected Outside Class Work, 153 Total Student Learning Hours.

Scheduled: Fall (even)

II. Coding Information

Repeatability: Not Repeatable, Take 1 Time

Grading Option: Graded or Pass/No Pass

Credit Type: Credit - Degree Applicable

TOP Code: 170100

III. Course Objectives

A. Course Student Learning Outcomes

Upon completion of this course the student will be able to:

1. Develop and present, in an oral or written format, a lesson involving basic mathematical concepts or procedures intended for an elementary school class which includes appropriate K-12 manipulatives and technology.
2. Demonstrate problem solving in the following seven strands specified by the State of California's Mathematics Model Curriculum Guide, kindergarten through grade eight: number, measurement, patterns and functions, statistics and probability, logic, and algebra.
3. Demonstrate logical thinking and applications of mathematics in problem-solving and critical thinking.

B. Course Objectives

Upon completion of this course the student will be able to:

1. Perform calculations with place value systems.

2. Evaluate the equivalence of numeric algorithms and explain the advantages and disadvantages of equivalent algorithms in different circumstances.
3. Apply algorithms from number theory to determine divisibility in a variety of settings.
4. Analyze least common multiples and greatest common divisors and their role in standard algorithms.
5. Explain the concept of rational numbers, using both ratio and decimal representations; analyze the arithmetic algorithms for these two representations; and justify their equivalence.
6. Analyze the structure and properties of whole, rational, and real number systems; define the concept of rational and irrational numbers, including their decimal representation; and illustrate the use of a number line representation.
7. Develop and reinforce conceptual understanding of mathematical topics through the use of patterns, problem solving, communication, connections, modeling, reasoning, and representation.
8. Develop activities implementing curriculum standards.

IV. Course Content

- A. Numeration system: history Hindu-Arabic numeration system, and place-value systems.
- B. Integers: structure and basic properties, computational algorithms.
- C. Basic number theory: divisibility, prime and composite numbers, prime factorization, fundamental theorem of arithmetic, least common multiple and greatest common divisor.
- D. Rational numbers: structure and properties, ratio and proportion.
- E. Real Numbers: structure and basic properties, arithmetic operations, rational and irrational numbers, decimal representation, number line representation.
- F. Patterns, problem solving, communication, connections, modeling, reasoning, and representation.
- G. National and State curriculum standards for elementary math including Common Core State Standards.

V. Assignments

A. Appropriate Readings

Students will be required to read and study the assigned class material and/or outside reading in professional journals such as *Arithmetic Teacher*.

B. Writing Assignments

Students will be expected to do the following:

1. Complete class preparation and review
2. Do homework assignments, including applications of representative symbol systems and/or word problems
3. Understand and apply theories and techniques taught in class.

C. Expected Outside Assignments

Students can be expected to spend a minimum of two hours outside of class in practice and preparation for each hour of class. Appropriate outside assignments include appropriate reading, practice problems, memorizing and applying formulas and writing papers on assigned topics.

D. Assignments that Demonstrate Critical Thinking

Students will be required to interpret mathematics principles and techniques to solve broader and more difficult problems than those presented in class. Students will solve

a variety of problems, including those that demand the application of principles in a number of different contexts.

VI. Methods of Evaluation

Traditional Classroom Evaluation

The student's grade will be based on homework assignments, multiple exams, collaborative Group Work, an optional research paper and a comprehensive final.

Online Evaluation

A variety of methods will be used, such as: research papers, asynchronous and synchronous discussions (chat/forum), online quizzes and exams, postings to online website, and email communications.

Correspondence Evaluation

Same as face to face with the exception of the desired use of proctored exams and exclusion of participation in classroom activities. Students will be expected to complete assignments and activities equivalent to in-class assignments and activities. Written correspondence and a minimum of six opportunities for feedback will be utilized to maintain effective communication between instructor and student.

Hybrid Evaluation

All quizzes and exams will be administered during the in person class time. Students will be expected to complete online assignments and activities equivalent to in class assignments and activities for the online portion of the course. Electronic communication, both synchronous and asynchronous (chat/forum) will be evaluated for participation and to maintain effective communication between instructor and students.

Web-enhanced course

Additional information and resources may be made available to students online, and students may be required to do research and complete and/or submit assignments online. Quizzes may be administered online, but exams and summative assessments must be administered face-to-face.

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery Correspondence Delivery

Hybrid Delivery

Online Delivery

Traditional Classroom Delivery

Lecture, questions and answers, demonstrations and discussion

Correspondence Delivery

Assigned readings, instructor-generated typed handouts, typed lecture materials, exercises and assignments equal to face to face instructional delivery. Written correspondence and a minimum of six opportunities for feedback will be utilized to maintain effective communication between instructor and student.

Hybrid Delivery

A combination of traditional classroom and online instruction will be utilized. Each semester a minimum of 17 hours, or 1/3 of the lecture hours, will be taught face-to face by the instructor and the remaining hours will be instructed online through the technology platform adopted by the District. Traditional class instruction will consist of exercises/assignments, lectures, visual aids, and practice exercises. Online delivery will consist of exercises/assignments, lecture posts, discussions, adding extra resources and other media sources as appropriate.

Online Delivery

Student will access course materials over the Internet. These will include a syllabus, homework assignments and tests. Instruction shall include video lectures, animations, and guided tutorials. Password protected asynchronous discussion, and synchronous messaging is also provided to allow for collaboration.

VIII. Representative Texts and Supplies

Billstein, Libeskind, Lott, Boschmans & Boschmans. A Problem Solving Approach to Mathematics for Elementary School Teachers, 13th Edition, 2020, Pearson Education. This textbook may be purchased in a cloth/paper bound version, ISBN: 978-0-135-183-885, or in a loose-leaf version, ISBN: 978-0-135-184-172, or as an eText version, ISBN 978-0-136-880-141 without MyLab Math

When a Math 11A section requires the use of MyLab Math, the eText and MyLab may be purchased separately or as a bundle, ISBN 978-0-135-960-363 (18 week eText and MyLab access) or ISBN 978-0-135-190-074 (24 month eText and MyLab access).

IX. Discipline/s Assignment

Mathematics

X. Course Status

Current Status: Active

Original Approval Date: 4/15/1993

Revised By: Noelle Eckley

Curriculum/Academic Standards Committee Revision Date: 04/05/2022