PARKLAND COLLEGE

Course Information Form (CIF)

Course Code: MAT 105

Course Title: Mathematics for Elementary Teachers I

Department: Mathematics
PCS Code: 1.1 - Baccalaureate/Transfer
CIP Code: 13.1202
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 3-0-3
Credit Hour Distribution:

Lecture: 3	Lab: 0	Clinical: 0	**Total: 3**

General Course Information

Catalog Description

Numeration systems; sets; problem solving and process standards; algorithms and contexts for whole, integer, and rational number operations; proportions and percentages; quantitative relationships. Focuses on reasoning, connections, and multiple representations. Does not satisfy general education elective for any transfer program.

General Course Objectives

Students will learn the mathematical background necessary to teach mathematics in grades K-8 and to succeed in MAT 106 (IAI M1 903), which satisfies the mathematics requirement for state certification as an elementary teacher.

Minimum Placement Levels

English	Reading	Math
None	None	None

Prerequisites

Credit in MAT 098 with a grade of C or higher, or placement

Methods of Evaluation

3 exams, 4-8 quizzes, homework, student class presentations, and a cumulative final exam.

Instructional Materials and Additional Supplies

Mathematics for Elementary School Teachers, 7th edition, by Bassarear and Moss. 1337629960

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Numeration Systems and Whole Numbers	1. Describe and use various historical numeration systems (Ancient Egyptian, Roman numerals, etc.). 2. Classify numbers within the real number system (natural, whole, integer, rational, irrational). 3. Write whole numbers in expanded form using place value. 4. Model base-10 and non-base-10 number systems using manipulatives and diagrams. 5. Represent base-10 numbers in other bases, and convert numbers into base-10.	3	0	0
Rational Numbers	1. Describe contexts and models (area, linear, set) for fractions and discuss presentation to elementary students. 2. Use manipulatives to represent fractions, mixed numbers, and decimals. 3. Understand a fraction a/b as the quantity formed by "a" parts of size "1/b" and use partitioning with area, linear, and set models involving fractions. 4. Compare fractions by reasoning about their size using benchmarks. 5. Write decimals in expanded form using place value. 6. Convert between fractions and decimals.	4	0	0
Set Theory and Venn Diagrams	1. Represent sets in roster notation and set-builder notation as appropriate. 2. Use set theory notation and interpret intersections, unions, differences, and complements of sets. 3. Create and interpret Venn diagrams in context.	2	0	0
Problem Solving and Process Standards	1. Discuss and apply the eight mathematical practice standards (MPs) and recognize the difference between subject matter knowledge and pedagogical content knowledge. 2. Define and identify growth mindset statements. 3. Describe the CPA (concrete-pictorial-abstract) progression for elementary school math concepts. 4. Demonstrate knowledge of problem-solving processes and the ability to use multiple strategies to solve word problems (including organized tables, diagrams, and algebra).	3	0	0
Addition and Subtraction of Whole Numbers	1. Describe contexts and models for addition and for subtraction (including set models, bar models, and number lines). 2. Identify parts of an addition statement and apply properties of addition. 3. Describe and apply algorithms for addition and for subtraction of whole numbers, and discuss methods of presentation to elementary students (including use of manipulatives and diagrams). 4. Use mental math and estimation techniques and explain when they are appropriate. 5. Recognize common errors elementary students make in addition and subtraction processes.	3	0	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Addition and Subtraction of Fractions, Decimals, and Signed Numbers	1. Understand and apply procedures for addition and subtraction of fractions, mixed numbers, decimals, and signed numbers, and describe methods for presentation to elementary students. 2. Use mental math and estimation techniques and explain when they are appropriate. 3. Understand subtraction as the inverse of addition, and solve comparison problems involving signed numbers.	4	0	0
Multiplication and Division of Whole Numbers	1. Describe contexts and models for multiplication and for division of whole numbers and discuss methods of presentation to elementary students. 2. Identify parts of a multiplication statement and apply properties of multiplication. 3. Describe and apply algorithms for multiplication of whole numbers (mental math strategies, area models, partial products, lattice method, and standard algorithm). 4. Compare units for addition with units for multiplication with real-world quantities. 5. Describe and apply algorithms for division of whole numbers (scaffolding and the standard algorithm) as well as strategies for mental computation and estimation. 6. Identify and understand the relationship among parts of a division problem (dividend, divisor, quotient, remainder) and correctly interpret the quotient and remainder in application problems. 7. Recognize common errors elementary students make in multiplication and division processes.	4	0	0
Multiplication and Division of Fractions, Decimals, and Signed Numbers	1. Apply concepts from number theory including primes, composites, divisibility tests, greatest common factors, and least common multiples. 2. Describe contexts and models for multiplication and division of fractions and mixed numbers and discuss methods of presentation to elementary students. 3. Understand and apply procedures for multiplication and division of fractions, mixed numbers, decimals, and integers, including strategies for mental math and estimation. 4. Use operation sense to choose the correct operation(s) to solve real-world problems with multiple steps and correctly interpret results. 5. Apply order of operations to evaluate expressions.	5	0	0
Ratios, Proportions, and Percents	1. Describe the difference between a ratio and a fraction, write equivalent ratios, and discuss methods of presentation to elementary students. 2. Analyze and solve problems involving ratios and proportions with strategies including diagrams, equivalent fractions, and algebra. 3. Convert fluently between fractions, decimals, and percentages. 4. Analyze and solve percent problems with strategies including diagrams, proportions, and percent equations. 5. Discuss methods of presentation to elementary students.	3	0	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Quantitative Relationships and Algebraic Thinking	1. Represent relations and functions in multiple ways (descriptive, numeric, visual, algebraic). 2. Describe the difference between continuous and discrete functions. 3. Generalize numerical patterns, including arithmetic and geometric sequences. 4. Understand slope as rate of change and descriptively analyze change on a graph. 5. Use balance scales and Singapore bars to model and solve one-variable linear equations and discuss progression from pictorial to abstract solutions for elementary students. 6. Solve word problems involving systems of simultaneous equations in multiple ways (including organized tables and algebra).	6	0	0
Reviews and Tests	1. Earn at least a 70 percent on each exam and the cumulative final exam.	8	0	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	0	0