STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
MATH 115 – Mathematics for Elementary Teachers I

Created by: Alice Reed

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Canino School of Engineering Technology

Department: Mathematics

Semester/Year: Spring/2019

A. **TITLE**: Mathematics for Elementary Teachers I

B. **COURSE NUMBER:** Math 115

C. **CREDIT HOURS: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)**

 # Credit Hours: 3
 # Lecture Hours: 3 **per week**
 # Lab Hours: **per week**
   Other: **per week**

Course Length: 15 **Weeks**

D. **WRITING INTENSIVE COURSE**: Yes ☐ No ☒

E. **GER CATEGORY:** **None:** ☐ **Yes:** GER 1 Mathematics
If course satisfies more than one: GER

F. **SEMESTER(S) OFFERED: Fall** ☐ **Spring** ☒ **Fall & Spring** ☐

G. **COURSE DESCRIPTION:**

The study of the development, meaning, and representations of numeration systems, operations on whole numbers, number theory and the real number system. The focus of the course will be on mathematical representations for K-8 topics via problem solving. This course is only open to all students but will be of primary interest to those enrolled in the elementary education transfer program and Early Childhood. The majority of the course will be activity-based (exploration of topics through problem solving activities).

H. **PRE-REQUISITES:** **None** ☐ **Yes** ☒ **If yes, list below:**

Intermediate Algebra (MATH 106) with a grade of C or better, or 2 high school regents math courses with a grade of 75 or above on the second New York State Regents mathematics examinations, or permission of instructor.

CO-REQUISITES: None ☒ **Yes** ☐ **If yes, list below:**

I. **STUDENT LEARNING OUTCOMES**: (*see key below*)

By the end of this course, the student will be able to:

Course Student Learning Outcome [SLO]	Program Student Learning Outcome [PSLO]	GER [If Applicable]	ISLO & SUBSETS	
Represent and perform arithmetic operations in various bases including converting numbers from one base to another		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Perform the four fundamental operations of arithmetic and determine why particular algorithms work		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Classify a number by the number of its factors and test for divisibility		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Model operations with fractions		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Recognize equivalent fractions by creating fraction manipulatives		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
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			ISLO	Subsets
			ISLO	Subsets
			ISLO	Subsets
				Subsets

KEY	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit./Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]*
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

*Include program objectives if applicable. Please consult with Program Coordinator

J. **APPLIED LEARNING COMPONENT:**   Yes ☐   No ☒

        If YES, select one or more of the following categories:

        ☐ Classroom/Lab   ☐ Civic Engagement
        ☐ Internship   ☐ Creative Works/Senior Project
        ☐ Clinical Placement   ☐ Research
        ☐ Practicum   ☐ Entrepreneurship
        ☐ Service Learning   (program, class, project)
        ☐ Community Service

K. **TEXTS:**

Bassarear, T. (2016). Mathematics for Elementary School Teachers (6th ed.) Boston: Houghton-
        Mifflin Company.
Bassarear, T. (2016). Mathematics for Elementary School Teachers Explorations (6th ed.)
        Boston: Houghton-Mifflin Company.

L. **REFERENCES:**

M. **EQUIPMENT: None** ☒   **Needed:**

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

in-class activities/lab work
oral reports
weekly journals about mathematical concepts encountered outside of the classroom
concept maps on the main topics
mini-projects (based on evaluations of K-8 textbooks problems, videos of elementary
        classroom discussions and elementary student work samples)
portfolio
hourly exams

P. **DETAILED COURSE OUTLINE:**

I. Numeration Systems
1. **Represent numbers in various numeration systems**
2. **Represent a number in various bases (compose and decompose)**
3. **Convert a numeral from base ten to another base**
4. **Convert a numeral from one base to base ten**
5. **Perform arithmetic operations with numerals in bases other than ten.**

II. Operations with Natural Numbers, Whole Number, and Integers
1. **Determine what properties hold for a set of numbers**

2.   Classify word problems by operation type
3. !   Perform arithmetic operations with integers
4. !   Determine why particular algorithms work (addition, subtraction, multiplication, and division)

III. Number Theory
1. !   Find all factors of a number
2. !   Write the prime factorization of a number
3. !   Classify a number by the number of its factors
4. !   Test whether one number is divisible by another number
5. !   Find the greatest common factor of two or more numbers
6. !   Find the least common multiple of two or more numbers
7. !   Perform arithmetic operations in modulo m
8. !   Represent figurate numbers symbolically

IV. The Real Number System
1. !   Recognize equivalent fractions
2. !   Model fractions with region, linear, and set models
3. !   Model operations with fractions
4. !   Simplify fractions
5. !   Classify word problems by operation category
6. !   Find a number between two other numbers
7. !   Represent quantities as ratios
8. !   Solve proportions
9. !   Convert fractions to decimals and decimals to fractions
10. !   Represent quantities as percents
11. !   Perform operations with decimals and percents
12. !   Find a number on the real number line

Q.   <u>LABORATORY OUTLINE</u>: None ☒ Yes ☐