Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: MATH 113 **Year: 2021-2022**
Course Title: Mathematics for Elementary School Teachers I **Credit Hours: 3**

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for accommodations. All course materials are available in alternate formats upon request.*

Course Description

This is the first in a two-semester course sequence for students who intend to become elementary school teachers, or for students in the Early Childhood program. It is designed to provide an understanding of the various mathematical concepts presented in elementary schools. There is an emphasis on problem solving, communicating using mathematical language and theory, rational numbers and decimals. No calculator use is allowed during class or on tests. Prerequisites: C or better grade in Math 098 or MATH 120 if required by placement testing; RDNG 116 if required by placement testing; prior completion or concurrent enrollment in ENGL 100. 3 Cr. (3 Lec.) Fall and spring semesters.

Course Context/Audience

This course engages students in hands on mathematical activities and problem solving that will enhance their conceptual knowledge of mathematical theory, its current applications, and its presentation in the elementary classroom. The course has been designed for students in the Liberal Arts and Sciences: Early Childhood Education (Teacher Education Transfer) and the Liberal Arts and Sciences: Childhood Education (Teacher Education Transfer) A.S. degree programs.

Basic Skills/Entry Level Expectations

Writing:	WC	College level writing skills are required. See course co-requisites or pre-requisites.
Math:	MC	C or better in MATH 120 (if needed) or appropriate placement score. Course requires the use of intermediate algebra skills and mathematical reasoning.
Reading:	R4	Before taking this course, students must satisfactorily complete RDNG 116 or have assessment indicating that no reading course was required.

Course Goals

Students in this course will develop an understanding of the mathematical concepts and the mathematical skills that are necessary to effectively teach early childhood and childhood mathematics. Exploration and modeling, conjecture and reasoning, and other problem solving techniques will be stressed as well as the communication of the solution process.

Course Objectives/Topics

Objective/Topic	% Course
Students will learn various problem-solving strategies.	15%
Students will organize objects with sets and use set operations to define subsets. Students will describe patterns in terms of functions.	15%
Students will learn various algorithms for whole number computation and be able to work problems in different based numeration systems.	15%
Students will be able to demonstrate their understanding of number theory by correctly partitioning sets.	20%
Students will be able to define rational numbers and apply them to ratios and proportions.	15%
Students will understand the relationship among decimals, percents, and real numbers. Students will be able to demonstrate the existence of irrational numbers.	10%
Students will be able to demonstrate the properties of closure, commutation, association, distribution, and inverse for all sets of numbers in the preceding objectives.	10%

General Education Goals - Critical Thinking & Social/Global Awareness

CRITICAL THINKING OUTCOMES	**HOW DOES THE COURSE ADDRESS THE OUTCOMES** (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
Students will be able to ➢ develop meaningful questions to address problems or issues. ➢ gather, interpret, and evaluate relevant sources of information. ➢ reach informed conclusions and solutions. ➢ consider analytically the viewpoints of self and others.	• Polya's problem solving technique is taught (understand the problem; devise a plan). Non-algebraic approaches to problem solving are stressed. • Story problems on every assignment. • How to use questioning in a search engine for lesson and homework ideas is presented. Elicit appropriate questions for in-class search. • Recent articles pertaining to elementary math are shared. • Analysis of the application of addition with manipulatives to the other binary operations • Student must explain how solutions are reached. • Students are encouraged to share personal experiences. • Student gives alternate approaches to same problem. • Student compares/contrasts experience with vision portrayed in article(s).

SOCIAL/GLOBAL AWARENESS OUTCOMES	HOW DOES THE COURSE ADDRESS THE OUTCOMES (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
➢ Students will begin to understand how their lives are shaped by the complex world in which they live. ➢ Students will understand that their actions have social, economic and environmental consequences.	• Assumptions based on one's culture and experiences are challenged. • Consequences of induction and deduction are discussed. • Cheating is openly discussed. Create story problems that are encouraging to children of other cultures and experience. Read Ten, Nine, Eight by Molly Bang out loud for its math and pictures of father/child and people of color. • Describe how math is portrayed in media. • How could induction result in bias against a particular group? • Have class describe the ideal teacher for one's own children. The responsibility of the early childhood educator is stressed. Read (or post on Angel) relevant current article(s) to class. Read and discuss The Monster Who Did My Math by Danny Schnitzlein to the class. Alternatives to expensive educational manipulatives are presented. Teacher impact on student opportunities are discussed. Students share alternate items to use. Students share alternate ways to correct errors without shutting elementary students off from success in math. • Read and discuss Math Curse by Jon Scieszka to the class. • Reduce, reuse, and recycle are themes for elementary lessons • Model classroom recycling. • Have students evaluate items used in demonstrations for their environmental impact.

Instructional Methods

1. The textbook(s) should be used as an organizational tool for the course.
2. Lecture should be kept to a minimum.
3. Small group exploration allowing students to discuss concepts and model problems should be employed.
4. Hands-on activities to reinforce concepts and demonstrate teaching methodology are necessary. This course must emphasize "how did you find your solution?" as opposed to "what is the solution?" Refer to the NCTM Principles and Standards for School Mathematics. Refer to the new Common Core Standards for Mathematics.

Methods of Assessment/Evaluation

Method	% Course Grade
Tests/Quizzes	30-50%
Final	15-25%
Projects/Presentations	0-25%
Midterm	0-25%
Homework/Classwork/Groupwork	0-30%

Text(s)

Mathematics for Elementary Teachers with Activities, Sybilla Beckmann, Author, 4th ed., © Pearson ISBN 978-0-321-82572-8 (Required)

Bibliography

Mathematics for Elementary School Teachers, 7th edition, Billstein, Libeskind, & Lott, Addison Wesley Longman ISBN 0-201-38408-6.

Mathematics for Elementary School Teachers: An Activity Approach, 6th edition, Albert B. Bennett & L. Ted Nelson, McGraw Hill, Inc. ISBN 0-07-253307-2.

Mathematical Reasoning for Elementary Teachers, 2nd edition, Calvin Long & Duane DeTemple, Addison Wesley Longman ISBN 0-321-04333-2.

Mathematics for Elementary Teachers: A Contemporary Approach, 4th edition, Gary L. Musser & William F. Burger, Prentice Hall, Inc. ISBN 0-13-246182-X.

Mathematics for Elementary Teachers, 3rd edition, Tom Bassarear, Houghton Mifflin Co. ISBN 0-618-34886-7.

National Council of Teachers of Mathematics (NCTM). Principles and Standards for School Mathematics.

National Council of Teachers of Mathematics (NCTM). Curriculum and Evaluation Standards for School Mathematics.

National Council of Teachers of Mathematics (NCTM). Professional Standards for Teaching Mathematics.

National Association for the Education of Young Children (NAEYC). The Young Child and Mathematics, ISBN 0-935989-97-8

Other Learning Resources

Audiovisual No resources specified
Electronic No resources specified
Other No resources specified