**MATH 121** 

#### City Colleges of Chicago Course Title: Math For Elementary Teachers I (IAI Code: M1 903)

Length of course: 16 Weeks

Contact Hours: 4 Contact Hours

Credit Hours: 4 Credit Hours

Lecture Hours: 4 Lecture Hours

Lab Hours:

Weekly Plan: 4 Hours

# Catalogue Description:

This course focuses on mathematical reasoning and problem solving. Topics include operations with rational and irrational numbers, sets, functions, logic, numeration systems and number theory, solution of linear equations in one variable. Applications are included throughout the course. **Problem solving with the use of calculators and computers is emphasized throughout the course.** Writing assignments, as appropriate to the discipline, are part of the course.

## Students the Course is Expected to Serve:

This course is intended for students who are elementary or special education majors, and require general education mathematics courses for their undergraduate degree.

## **Pre-requisites:**

Consent of Chair -- or Placement Test -- or Prerequisite -- MATH 099 With a minimum grade of 'C'

#### **Course Objectives:**

- 1. Select, apply, and translate among mathematical representations to solve problems.
- 2. Communicate orally and in writing their mathematical thinking coherently and clearly to peers, teachers, and others.
- 3. Apply and adapt a variety of appropriate strategies to solve problems, including technology.
- 4. Make and investigate mathematical conjectures individually and collaboratively.
- 5. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
- 6. Gain an understanding and appreciation of the National Council of Teachers of Mathematics (NCTM) curriculum standards.

## Student Learning Outcomes:

Upon satisfactory completion of the course, students will be able to:

- A. Model fractions using manipulatives (e.g. pattern blocks, tiles, etc).
- B. Represent numbers in equivalent forms using fractions, decimals, percents, exponential and scientific notation.
- C. Solve linear equations involving whole numbers, integers, and rational numbers.
- D. Formulate and apply linear equations to a contextual-based (real-world) scenario.
- E. Identify the prime factorization of a number.
- F. Compute the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of numbers.
- G. Classify numbers within the real number system.
- H. Identify and apply the properties of real numbers (i.e., commutative, associative, distributive, etc).

- I. Estimate the results of a computation within a specified range.
- J. Apply ratios, proportions and percents to a contextual (real-world) situation.
- K. Perform operations (i.e., union, intersection, complement, etc.) on sets using appropriate notation.
- L. Model contextual (real-world) situations using concepts of sets, including Venn diagrams.
- M. Identify functions as linear or nonlinear and contrast their properties from various representations.
- N. Perform operations on functions using appropriate notation.

## **Topical Outline:**

Suggested Timeframe

<u>Week</u>	Topic
1-2	Introduction to Problem Solving
3 - 4	Introduction to Sets and Functions
5 - 6	Operations on Whole Numbers
7 - 8	Number Systems
9 - 10	Introduction to Number Theory
11 - 12	Operations on Rational Numbers
13 - 14	Operations on Real Numbers
15 - 16	Algebraic Concepts of Functions

#### Calendar:

## Methods of Evaluation:

# Total Percentage: 0%

The weight given to exams, quizzes, and other instruments used for evaluation will be determined by the instructor.

#### Methods of Assessment:

Exams, quizzes, homework and other assessments will be used as appropriate to measure student learning.

#### Methods of Instruction:

Problem-based activities, collaborative-learning techniques, and lecture will be used as appropriate.

#### **Recommended Text:**

- 1. Divito, Art *Mathematics for Elementary Teachers: Content and Concepts* 2nd Edition, McGraw-Hill, 2005 ISBN: 0073391735
- 2. Bassarear, T. *Mathematics for Elementary School Teachers* 4th Edition, Houghton Mifflin, 2008 ISBN: 0-618-76836-X
- 3. Billstein, Libeskind & Lott *Mathematics for Elementary School Teachers* 9th Edition, Addison-Wesley, 2007
- 4. Musser, Burger, & Peterson *Mathematics for Elementary Teachers* 8th Edition, John Wiley & Sons, Inc., 2008