

CITY COLLEGES OF CHICAGO

Mathematical Literacy for College Students

Course Title:	Mathematical Literacy for College Students
Length of course:	16 Weeks
Contact Hours:	6 Contact Hours
Credit Hours:	6 Credit Hours
Lecture Hours:	6 Lecture Hours
Lab Hours:	0 Lab Hours
Weekly Plan:	6 Hours

Catalog Description:

Mathematical Literacy for College Students is designed to enable students to develop conceptual understanding and problem solving competence as preparation for quantitative and statistical reasoning level math. This course integrates numeracy; proportional, algebraic & statistical reasoning; functions and modeling and focuses on developing mathematical maturity through problem solving, critical thinking, data analysis, and the writing and communications of mathematics. Students will develop conceptual and procedural tools that support the use of key mathematical concepts in a variety of contexts. Emphasis is placed on modeling and problem solving, with techniques and manipulations covered in context. Throughout the course, Math success content will be integrated with mathematical topics. Credit earned does not count toward any degree, nor does it transfer.

This course is intended to serve:

Students with developmental math needs who plan on a future in Humanities or Social Sciences, as well as students who plan to graduate at CCC with an Associate in Arts or an Associate in General Studies. Upon successful completion of this course, students will be allowed to enroll in Math 118 or Math 125. [This course is not intended for STEM (Science, technology, engineering, and math), business or education majors].

Pre-requisites:

Foundational Studies Math 3002 with a grade of “S”, or Placement test¹ or Consent of Department Chairperson **and** Eligibility for Reading 125 or higher

Course Objectives:

1. Apply the concepts of numeracy in multiple contexts.
2. Recognize proportional relationships and use proportional reasoning to solve problems.
3. Use algebra to write relationships that involve variables, interpret those relationships, and solve problems.
4. Interpret and move flexibly between multiple formats including words, graphs, tables, and equations.
5. Develop the ability to think critically and solve problems in a variety of contexts using the tools of mathematics and technology.
6. Demonstrate understanding of the characteristics of functions and apply this knowledge in modeling and problem solving.
7. Use mathematically correct vocabulary and symbolism to communicate orally- and in writing- problem statements, problem-solving methods, and interpretations of the solutions to problems.
8. Recognize statistical relationships and use statistical reasoning to solve problems.

¹ Separate document outlines placement cut-scores

Student Learning Outcomes: Upon successful completion of this course, the student will be able to:

1. Demonstrate operation sense and communicate verbally and symbolically the effects of common operations on numbers.
2. Demonstrate an understanding of and competency in using magnitude in the context of place values, fractions, and numbers written in scientific notation.
3. Use estimation skills, knowing how and when to estimate results and to what precision, to solve problems, detect errors, and check accuracy.
4. Demonstrate measurement sense. (Calculate geometry formulas; Convert units; Find unknown values with appropriate units; etc.)
5. Demonstrate an understanding of the mathematical properties and uses of different types of mathematical summaries of data (e.g., measures of central tendency) and mathematical models.
6. Read, interpret, and make decisions based on data from graphical displays (e.g., line graphs, bar graphs, scatterplots, and histograms).
7. Interpret the structure of expressions: Identify parts of an expression, such as terms factors and coefficients
8. Write expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
9. Perform arithmetic operations on polynomials
10. Use Factoring to Solve Equations.
11. Create equations that describe relationships. Create equations and inequalities in one variable and use them to solve problems.
12. Solve equations and inequalities in one variable, including equations with coefficients represented by letters.
13. Solve systems of equations algebraically & graphically
14. Interpret equations that arise in applications in terms of the context
15. Analyze equations using different representations
16. Determine linear equations that models a relationship between two quantities
17. Compare linear, quadratic, and exponential models and solve problems
18. Recognize proportional relationships from verbal and numeric representations.
19. Compare proportional relationships represented in different ways.
20. Apply quantitative reasoning strategies to solve real-world problems with proportional relationships. (including similar triangles)
21. Apply formulas of Area, Perimeter and Volume to basic 2- & 3- dimensional figures
22. Know and Apply the Pythagorean Theorem to various contextual situations
23. Demonstrate written and verbal skills in relation as appropriate to course content.
24. Demonstrate critical thinking by analyzing ideas, patterns, and principles.

25. Develop the ability to use mathematical skills in diverse scenarios and contexts, and demonstrate flexibility with mathematics through various contexts and presentations of information (tables, graphs, words, equations).

Topical Outline:

- I. Numeracy
 - a. Arithmetic operations of whole numbers, integers, fractions, decimals, and percentages
 - b. Magnitude and scientific notation
 - c. Estimation - knowing how and when to estimate results, to solve problems and to detect errors
 - d. Problems involving quantities or rates
 - e. Measurement
 - f. Data interpretation and measures of central tendency
 - g. Line graphs, bar graphs, and charts
 - h. Order of operations
- II. Proportional Reasoning
 - a. Proportional relationships from verbal and numeric representations
 - b. Comparing proportional relationships
 - c. Applying quantitative reasoning strategies to solve real-world problems involving proportionality
 - d. Using similarity to solve applications
 - e. Using dimensional analysis to convert units of measure
 - f. Writing and solving proportions
- III. Algebraic Reasoning
 - a. Uses of variables
 - b. Effects of variables on other variables in the algebraic relationship
 - c. Constructing and using equations or inequalities
 - d. Writing and interpreting compound inequalities in one variable
 - e. Writing and simplifying algebraic expressions by using the distributive property, combining like terms, and/or factoring
 - f. Applying the Pythagorean Theorem
- IV. Equations
 - a. Solving linear equations
 - b. Translating problems into a mathematical representation and vice versa including linear, exponential, and quadratic equations
 - c. Recognizing relationships in common forms: equations, graphs, and tables
 - d. Identifying and constructing linear models
 - e. Using appropriate terms and units to describe and interpret rate of change
 - f. Understand mathematical models
 - g. Applying formulas to solve problems related to perimeter, area, and volume
 - h. Solving a formula for one of its variables
 - i. Writing and solving systems of linear equations in two variables
 - j. Determining solutions for linear inequalities
 - k. Demonstrates successful use of Excel in real world context

Suggested Methods of Evaluation:

Students will be evaluated using a variety of methods including examinations and written assignments, group work, web based assignments or quizzes.

Quizzes	-?-
Homework	-?-
Objective tests	-?-
Studio/Lab performance	-?-
Summative final examination	-?-

Total Percentage: 100%

Suggested Methods of Instruction:

Group or collaborative learning techniques with problem-based activities
Discussion & Lecture as appropriate
Online problem solving & learning tool

Sample Text and Required Materials:

- Textbook
- Scientific Calculator
- Access to online tool & support