## *Mathematical Literacy for College Students (MLCS)*

6 semester hours
Prerequisite: Appropriate placement or prealgebra with a grade of "C" or better

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One goal of developmental mathematics education is to provide students with the necessary skills and understanding required to be successful in college level mathematics. Mathematical Literacy for College Students (MLCS) is a new course being developed at the national level by AMATYC's New Life for Developmental Mathematics. Its origins are related to Quantway, funded by the Carnegie Foundation, but it is more rigorous than Quantway to ensure it meets established standards in Illinois. It is a modality of implementation of the Illinois course, Preparatory Mathematics for General Education (PMGE), integrating beginning algebra and non-STEM intermediate algebra in one semester.

MLCS is an alternative path to certain college level math courses or further algebra. It integrates numeracy, proportional reasoning, algebraic reasoning, and functions with statistics and geometry as recurring course themes. Throughout the course, college success components are integrated with the mathematical topics. The course focuses on developing mathematical maturity through problem solving, critical thinking, writing, and communication of mathematics. Content is developed in an integrated fashion, increasing in depth as the course progresses. Upon completion of the course, students will be prepared for a statistics course or a general education mathematics course. Students may also take traditional intermediate algebra upon completion if they choose to pursue STEM courses.

MLCS provides an alternative to beginning algebra, creating multiple pathways for the developmental students. However, it is more difficult than beginning algebra to ensure students are prepared for a college level math course upon successful completion. It allows students to potentially complete their developmental math and college level math requirement for an Associate in Arts degree in one year total (one semester each), working toward the goal of improving college completion rates. It promotes 21st century skills to prepare students for both the workplace and future coursework. Further, it does not diminish requirements for non-STEM college level math courses but instead creates appropriate paths to these courses with the same level of intensity and complexity as the current path through intermediate algebra. The course has college level expectations and coursework but with a pace and instructional design intended for the adult, developmental learner. This strategy emulates the approach taken by the Common Core Standards and aligns with them as well.

## For more information on MLCS


Contact: Kathleen Almy, Heather Foes (Rock Valley College)

Emails: kathleenalmy@gmail.com heather.foes@gmail.com


Blog: http://almydoesmath.blogspot.com
*Blog contains video, pilot updates, presentations, and more.*

# MLCS Course Description and Objectives

Mathematical Literacy for College Students is a one semester course for non-math and non-science majors integrating numeracy, proportional reasoning, algebraic reasoning, and functions. Students will develop conceptual and procedural tools that support the use of key mathematical concepts in a variety of contexts. Throughout the course, college success content will be integrated with mathematical topics.

Prerequisite: Appropriate placement or prealgebra with a grade of "C" or better

## COURSE OUTCOMES

1. Apply the concepts of numeracy in multiple contexts.
2. Recognize proportional relationships and use proportional reasoning to solve problems.
3. Use the language of algebra to write relationships involving variables, interpret those relationships, and solve problems.
4. Interpret and move flexibly between multiple formats including graphs, tables, equations, and words.
5. Develop the ability to think critically and solve problems in a variety of contexts using the tools of mathematics including technology.

## COURSE OBJECTIVES

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

**Numeracy**

1. Demonstrate operation sense and the effects of common operations on numbers in words and symbols.
2. Demonstrate competency in the use of magnitude in the contexts of place values, fractions, and numbers written in scientific notation.
3. Use estimation skills.
4. Apply quantitative reasoning to solve problems involving quantities or rates.
5. Demonstrate measurement sense.
6. Demonstrate an understanding of the mathematical properties and uses of different types of mathematical summaries of data.
7. Read, interpret, and make decisions based upon data from line graphs, bar graphs, and charts.

**Proportional reasoning**

8. Recognize proportional relationships from verbal and numeric representations.
9. Compare proportional relationships represented in different ways.
10. Apply quantitative reasoning strategies to solve real-world problems with proportional relationships.

**Algebraic reasoning**

11. Understand various uses of variables to represent quantities or attributes.
12. Describe the effect that changes in variable values have in an algebraic relationship.
13. Construct and solve equations or inequalities to represent relationships involving one or more unknown or variable quantities to solve problems.

**Functions**

14. Translate problems from a variety of contexts into a mathematical representation and vice versa.
15. Describe the behavior of common types of functions using words, algebraic symbols, graphs, and tables.
16. Identify the reasonableness of a linear model for given data and consider alternative models.
17. Identify important characteristics of functions in various representations.
18. Use appropriate terms and units to describe rate of change.
19. Understand that abstract mathematical models used to characterize real-world scenarios or physical relationships are not always exact and may be subject to error from many sources.

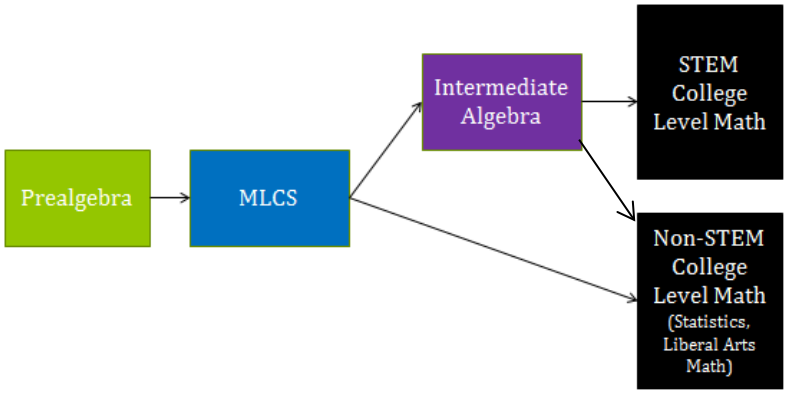
**Mathematical success**

20. Develop the ability to use mathematical skills in diverse scenarios and contexts.
21. Use technology appropriately including calculators and computers.
22. Demonstrate critical thinking by analyzing ideas, patterns, and principles.
23. Demonstrate flexibility with mathematics through various contexts, modes of technology, and presentations of information (tables, graphs, words, equations).
24. Demonstrate and explain skills needed in studying for and taking tests.

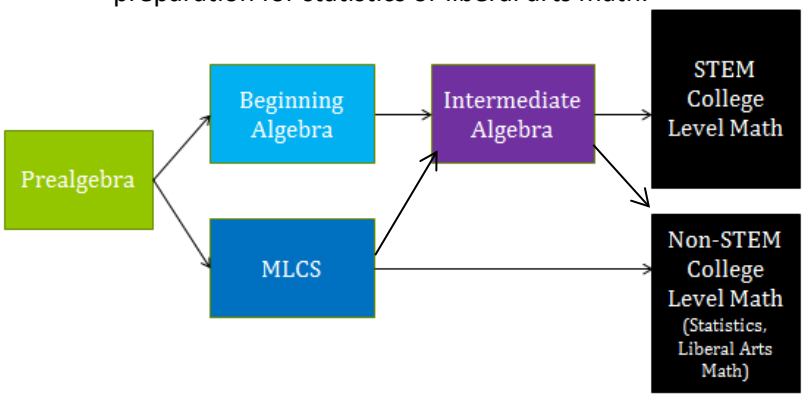
## Implementation Options

MLCS is a 6 credit hour course.

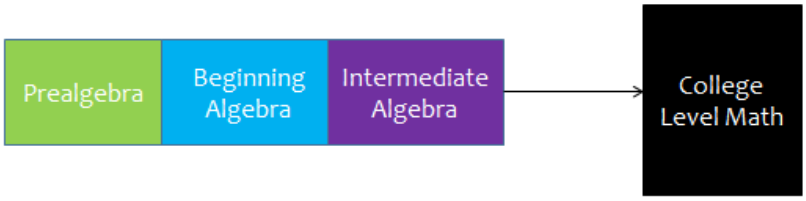
1. Replacement Model: Use MLCS to replace beginning algebra.




2. Augmented Model: Use MLCS to create a non-STEM alternative to beginning algebra that provides sufficient preparation for statistics or liberal arts math.




3. Supplemental Model: Use MLCS lessons for problem solving sessions in an Emporium model (lab-based traditional redesign.), engaging all students and moving beyond skills alone.




4. High School Model: Use MLCS lessons for 4th year high school course to develop college readiness and help students place into college level math.