LAGUARDIA COMMUNITY COLLEGE
CITY UNIVERSITY OF NEW YORK
MATHEMATICS, ENGINEERING, and COMPUTER SCIENCE DEPARTMENT

Fall 2020

MAT099 - FUNDAMENTALS of ALGEBRA

4 Lecture Hours, 2 Computer Lab Hour, 1 Tutoring Hour, 0 Credits

---

Catalog Description

This course fulfills the CUNY Proficiency in Basic Skills Mathematics. It includes the following topics: operations on whole numbers, fractions and decimals, solving linear equations, operations on polynomials, graphing linear equations, finding slope and equations of lines, solving systems of linear equations, factoring, simplifying radical expressions, and solving quadratic equations.

Instructional Objectives

During this course, the instructor expects to:

1. Reinforce the arithmetic skills necessary to solve algebraic problems involving whole numbers, integers, and fractions
2. Reinforce signed number skills and order of operations.
3. Familiarize students with the basics of plane geometry, in particular providing them with formulas for calculating the areas and perimeters of familiar geometric figures, and solving right triangles using Pythagorean Theorem.
4. Reinforce and expand students' abilities to solve linear equations and linear inequalities.
5. Provide the students with the skills necessary to construct graphs from linear equations in two variables and to deduce linear equations from given graphs.
6. Enable students to solve systems of linear equations graphically and algebraically.
7. Reinforce the laws of exponents in the more general setting of integer exponents.
8. Provide students with the skills required to carry out arithmetic operations on polynomials and factoring.
9. Familiarize students with the algebra of radical expressions.
10. Enable students to solve quadratic equations by factoring and by using the quadratic formula.

Performance Objectives

At the conclusion of this course, students will be able to:

1. Solve algebraic problems involving whole numbers, integers and fractions using a full range of arithmetic skills.
2. Perform calculations with signed numbers and exponents.
3. Compute areas and perimeters of basic two-dimensional geometric figures and solve the right triangle using the Pythagorean Theorem.
4. Solve linear equations and linear inequalities.
5. Understand the interplay of algebra and geometry in drawing graphs of straight lines and deriving linear equations from straight lines.
6. Solve systems of linear equations graphically and algebraically.
7. Apply laws of exponents appropriately including integer exponents.
8. Perform arithmetic operations on polynomials, including factoring.
9. Compute and simplify radical expressions.
10. Solve various types of quadratic equations.

Required Online Access: https://ohm.lumenlearning.com. Free textbook is available on ohm.lumenlearning.com. Online access is required for tutorials, homework and quizzes. Students must purchase the access code for the online LUMEN platform. The cost is currently $20 via online on LUMEN or about $25 at the college's bookstore. Lumen Learning OHM website: https://ohm.lumenlearning.com

Resources: A scientific calculator is required in this course. A graphic calculator, a programmable calculator or a calculator in a cellular phone is not allowed to use in this course.

Evaluation

The purpose of a grading system is to give you, the student, and anyone else reading your transcript an accurate record of your performance in this course. The role of the Mathematics, Engineering & Computer Science Department is to provide a fair, valid, and reliable structure for assessing your achievement.

Grading Categories:

Homework ……...…. 20%

Two Instructor's Tests ……. 15%

Two departmental exams…. 30%

CUNY Final exam …… 35%

A student with a class average of 70% or higher will pass the course.

If a student has a failing class average (less than 70) then the student receives either an **R** or an **F** grade, as appropriate.

In certain instances, at the discretion of the instructor, a student may be asked to demonstrate his/her ability of conceptually understanding the work he/she submitted. In such instances, the instructor may ask any student for a written or oral (live video session) clarification or explanation of solutions to any assignment, including homework, quizzes, tests, final exam, etc.

Solutions submitted by students for any assignment in this course, including homework, quizzes, tests, final exam, etc., must be based on the covered material. Solutions that are based on material that was not or will not be covered in this course or will be covered but has not been covered yet, will not be accepted and will receive no credit.

Academic Integrity

This class will be conducted in compliance with LaGuardia Community College's academic integrity policy.

Attendance

The maximum number of unexcused absences will be **12 hours**. Unexcused absences beyond this maximum will result in a grade of **WU** or **F**. Absence of tutoring lab class counts to absence of the class.

Explanation of Grading Categories

1. **Homework**
   Students will do homework online using Lumen Learning platform.

2. **Instructor's Test**
   There will be two instructor's tests during the semester in the 3rd week and 8th week.

3. **Departmental exams**
   The first departmental exam will cover material from week 1 to week 4 in the course outline and the second departmental exam will cover material from week 1 to week 9 in the course outline.

4. **CUNY Final Exam**
   This exam will be given during the final examination week. It will consist of 25 multiple-choice questions, which must be completed in 100 minutes. A scientific calculator is allowed to use during the CEAFE final exam.

IN ORDER TO PASS THIS COURSE, YOU MUST HAVE

a) **an average total score (computed as stated above) of at least 70,**
b) **no more than 12 hours of unexcused absences,**
c) **completed all assignments, instructor's exams, departmental exams, and CUNY Final Exam.**

S/R/U grading system: The A/B/C/D/F grading scale is ***not*** used in MAT099. LaGuardia's policy for grading in MAT099 is as follows:

- If you meet the above evaluation criteria, you'll receive a passing grade of "S" (Satisfactory).
- If you don't meet the evaluation criteria, and you don't have any previous "R" grades in MAT099, you'll receive an "R" grade, and you will have to repeat the course.
- If you don't meet the criteria, and you've already received one "R" grade in MAT099, you'll receive another "R," and you will have to repeat the course.
- If you don't meet the evaluation criteria, and you've already received two or more "R" grades in MAT099, you'll receive a "U" grade, and you will have to repeat the course.

Also, the College's policy concerning grades of W, WN, and WU apply to MAT099.

COURSE OUTLINE FOR MAT099

Note: The following syllabus is a guide for classroom instruction. It is subject to change based on the College's academic calendar.

Week	Lesson	TOPIC	Important Topics	Homework
1	**1-4**	**Whole numbers and Integers** Basic operations with whole numbers (Optional) Basic operations with integers, Order of operations with integers Evaluation	Multiplication of whole numbers, Addition and subtraction of integers, Multiplication and division of integers Evaluation	**Chapter 1:** **HW5 – HW8**
	5- 6 **7**	Computer lab, Introduction to LumenOHM Tutoring Hour (Run by Tutor)	(Tutoring Hour Activity Should be Designed by Professor)	
2	**8-11**	**Fractions** Introduction to fractions and mixed numbers Simplifying fractions Basic operations with fractions Computer lab: LumenOHM Homework	Addition, subtraction, multiplication, and division of fractions	**Chapter 2:** **HW9 - HW10**

	12-13 **14**	Tutoring Hour (Run by Tutor)	(Tutoring Hour Activity Should be Designed by Professor)	
3	**15-18**	**Fractions and Linear Equations** Solving equations with multiple step Solving equations containing fractions Literal equations	Solving linear equations Solving fraction equations Literal equations	**Chapter 3:** **HW11 – HW15**
	19 **20** **21**	Computer lab: **Instructor's Test 1** Computer lab: LumenOHM Homework Tutoring Hour (Run by Tutor)	(Tutoring Hour Activity Should be Designed by Professor)	
4	**22-25**	**Translations and Linear Inequalities** Solving inequalities with multiple steps Translating phrases and sentences Review for Departmental Exam 1	Solving Linear Inequalities Translating phrases and sentences	**Chapter 3:** **HW16 – HW20**
	26	Tutoring Hour (Run by Tutor)	(Tutoring Hour Activity Should be Designed by Professor)	
	27-28	Computer lab: **Departmental Exam 1**		
5	**29-32**	**Graphing Linear Equations in Two Variables** Rectangular coordinates and graphing equations in two variables Slope of a line Slope-intercept form of a line Point-slope form of a line	Graphing equations in two variables, Slope of a line, Slope-intercept form of a line, Point-slope form of a line	**Chapter 4:** **HW21 – HW24**
	33-34 **35**	Computer lab: LumenOHM Homework Tutoring Hour (Run by Tutor)	(Tutoring Hour Activity Should be Designed by Professor)	
6	**36-39**	**Systems of Linear Equations in Two Variables** Parallel and Perpendicular lines Solving systems by graphing Solving systems by substitution Solving systems by addition	Parallel lines Solving systems by graphing Solving systems by substitution Solving systems by addition	**Chapter 4:** **HW25 – HW27** **Chapter 5:** **HW28 – HW29**
	40-41 **42**	Computer lab: LumenOHM Homework Tutoring Hour (Run by Tutor)	(Tutoring Hour Activity Should be Designed by Professor)	
7	**43-46**	**Properties of Exponents** Properties of exponents More properties of exponents Negative exponents Addition and subtraction of polynomials	Multiplication of like bases Power Rule Negative exponents Addition and subtraction of polynomials	**Chapter 6:** **HW30 – HW32**
	47-48 **49**	Computer lab: LumenOHM Homework Tutoring Hour (Run by Tutor)	(Tutoring Hour Activity Should be Designed by Professor)	
8	**50-53**	**Polynomials** Addition and subtraction of polynomials (continued) Multiplication of polynomials and special products Division of a polynomial by a monomial	Multiplication of polynomials and special products Division of polynomials by monomials, GCF, factoring by	**Chapter 7:** **HW33 – HW38**

	54 **55** **56**	Computer lab: **Instructor's Test 2** Computer lab: LumenOHM Homework Tutoring Hour (Run by Tutor)	grouping (Tutoring Hour Activity Should be Designed by Professor)	
9	**57-60** **61**	**Factoring Polynomials** GCF, factoring by grouping Factoring monic trinomials Factoring trinomials: AC-method, Review for Departmental Exam 2 Tutoring Hour (Run by Tutor)	 Factoring monic trinomials AC-method (Tutoring Hour Activity Should be Designed by Professor)	**Chapter 8:** **HW39 – HW41**
	62-63	Computer lab: **Departmental Exam 2**		
10	**64-67** **68-69** **70**	**Factoring and Radicals** Difference of squares and perfect square trinomials Solving equations by factoring Square roots Simplifying roots Addition and subtraction of radicals Computer lab: LumenOHM Homework Tutoring Hour (Run by Tutor)	 Difference of squares, perfect squares Solving equations by factoring Simplifying square roots, Addition and subtraction of radicals (Tutoring Hour Activity Should be Designed by Professor)	**Chapter 8:** **HW42 – HW44** **Chapter 9:** **HW45 – HW46**
11	**71-74** **75-76** **77**	**Radicals and Evaluation** Multiplication of radicals Division of radicals and rationalization The square root property Quadratic Formula Pythagorean Theorem Computer lab: LumenOHM Homework Tutoring Hour (Run by Tutor)	 Multiplication of radicals Division or radicals, rationalization Square root property Pythagorean Theorem (Tutoring Hour Activity Should be Designed by Professor)	**Chapter 9:** **HW47 – HW51**
12	**78-82** **83**	**Cumulative review for the CUNY Final Exam** **Final Online Pre-test**		
	84	**Final: CEAFE Exam**		