Montgomery County Community College MAT 090 Fundamentals of Algebra 0-2-0

COURSE DESCRIPTION:

An introductory course which will prepare students for college level algebra. MAT 090 may be taken as a pre-requisite to or as a corequisite with MAT100. This course does not offer college-level credit. Topics include real numbers, operations between real numbers and their properties, signed numbers and the rules of signs, exponents and powers, fractions, fractional exponents and roots, an introduction to real variables and symbolic algebraic manipulations, analysis of rational expressions and functions, an introduction to the graphical representation of data, linear functions, linear equations, and solving and graphing quadratic equations. MAT 090 is a precollege level course and cannot be used to fulfill a degree requirement, nor is it calculated in a student's Grade Point Average (GPA). A graphing calculator is required. Instruction will be presented using a TI-84+.

REQUISITES:

Previous Course Requirements

MAT 080 Fundamentals of Mathematics with a minimum grade of "C." Students may also place directly into MAT 090 using a college-approved multiple measures method (see comments below).

Previous or Concurrent Course Requirements None

COURSE COMMENT(S):

Placement into MAT 090 follows successful completion of MAT 080 with a grade of "C" or better, or a college-approved multiple measures placement method, which may include a placement exam.

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Utilize the order of operations with real numbers, rational	Readings Lectures Student Discussions and/or	Assignments Quizzes Tests
expressions, and applications.	Presentations Homework and Project Assignments	Projects
 Compute powers and apply the laws of exponents. 	Readings Lectures Student Discussions and/or Presentations Homework	Assignments Quizzes Tests Projects

	and Project Assignments	
 Compute ratios and proportions and use these concepts to solve real-world problems. 	Readings Lectures Student Discussions and/or Presentations Homework and Project Assignments	Assignments Quizzes Tests Projects
 Graph data and linear and quadratic equations by hand on the Cartesian coordinate system. 	Readings Lectures Student Discussions and/or Presentations Homework and Project Assignments	Assignments Quizzes Tests Projects
5. Solve linear equations and literal equations.	Readings Lectures Student Discussions and/or Presentations Homework and Project Assignments	Assignments Quizzes Tests Projects
 Factor polynomials of degree 2 and higher and with a leading coefficient that is not equal to 1. 	Readings Lectures Student Discussions and/or Presentations Homework and Project Assignments	Assignments Quizzes Tests Projects
7. Solve equations using factoring and the quadratic formula.	Readings Lectures Student Discussions and/or Presentations Homework and Project Assignments	Assignments Quizzes Tests Projects
8. Add, subtract and multiply polynomial expressions.	Readings Lectures Student Discussions and/or Presentations Homework and Project Assignments	Assignments Quizzes Tests Projects
9. Reduce rational expressions.	Readings Lectures Student Discussions and/or Presentations Homework and Project Assignments	Assignments Quizzes Tests Projects
10. Simplify operations with rational expressions.	Readings Lectures Student Discussions and/or Presentations Homework	Assignments Quizzes Tests Projects

and Project Assignments	

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Director of Educational Effectiveness. The benchmark for each learning outcome is that 70% of students will meet or exceed outcome criteria.

SEQUENCE OF TOPICS:

- 1. Understand and utilize the order of operations with real numbers, rational expressions, and applications.
- 2. Compute powers, understand and apply the laws of exponents.
- 3. Understand the notions of ratio and proportion. Use these concepts to solve real-world problems.
- 4. Use the Cartesian coordinate system to graph data and linear and quadratic equations by hand.
- 5. Solve linear equations and literal equations.
- 6. Factor polynomials of degree 2 and higher and with a leading coefficient that is not equal to 1.
- 7. Solve equations using factoring and the quadratic formula.
- 8. Add, subtract and multiply polynomial expressions.
- 9. Reduce rational expressions.
- 10. Perform operations with rational expressions.

LEARNING MATERIALS:

Textbook: Developmental Mathematics, 4th edition, Elayn Martin-Gaye, Pearson or Intermediate Algebra, 2e, OpenStax

Calculator: TI-84+

Computer: A computer and internet connectivity are required to access online materials.

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by: Stephanie Isaac VPAA or designee Compliance Verification:

Date: 2/22/2023 Date: 2/22/2023

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This course is consistent with Montgomery County Community College's mission. It was developed, approved, and will be delivered in full compliance with the policies and procedures established by the College.