MATH A010: ELEMENTARY ALGEBRA

Item	Value
Curriculum Committee Approval Date	12/04/2024
Top Code	170100 - Mathematics, General
Units	4 Total Units
Hours	72 Total Hours (Lecture Hours 72)
Total Outside of Class Hours	0
Course Credit Status	Credit: Non-Degree Applicable (C)
Material Fee	No
Basic Skills	Basic Skills (B)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

Operations of algebra including first degree equations and inequalities, exponents, special products and factoring, rational expressions, graphing, radicals, systems of linear equations and quadratic equations will be presented. A minimum of five arranged hours of supplemental learning per semester in the Success Center is suggested. NOT DEGREE APPLICABLE. PREREQUISITE: MATH A008 or appropriate placement. Not Transferable.

Course Level Student Learning Outcome(s)

1. Perform operations on real numbers and algebraic expressions.
2. Write, solve, graph and interpret linear equations and inequalities by applying the relevant mathematical principles, operations and strategies.
3. Solve nonlinear equations such as rational, radical and quadratic equations by applying the mathematical principles, operations and strategies.
4. Reduce a real-world application problem into mathematical equations and solve those equations using algebraic methods.

Course Objectives

- 1. Perform operations on signed numbers.
- 2. Solve linear equations and inequalities.
- 3. Solve systems of equations in two variables by graphing, substitution and elimination.
- 4. Read, analyze, write equations and solve applications of elementary algebra.
- 5. Factor polynomials of the form ax +bx+c.
- 6. Graph linear equations and inequalities.
- 7. Simplify rational expressions and solve rational equations.
- 8. Simplify radicals and solve radical equations involving square roots.
- 9. Solve quadratic equations.
- 10. Use the quadratic formula.
- 11. Understand completing the square.

Lecture Content

Review fundamental arithmetic and geometric concepts Review real numbers and variables Signed numbers, exponents; distributive, commutative and associative properties Distinguish between terms and factors Solve linear equations and inequalities in one variable Solve linear equations with integer or fraction coefficients Solve literal equations and formulas Solve inequalities with integer or fraction coefficients and graph their solutions Solve selected word problems involving equations in one variable Translate English sentences into algebraic equations Use equations to solve applied problems. Introduce rules of exponents and basic operations of polynomials Discuss and use the algebraic rules for products, quotients and powers with integer exponents Introduce polynomials and the rules for addition and subtraction Multiplication of polynomials Division of a polynomial by a monomial or a binomial Introduce methods of factoring including GCF, grouping, trinomials and special cases Prime factorization of integers Special cases include perfect square trinomials and the difference of squares Rational expressions Combine, simplify, add, subtract, multiply and divide rational expressions Simplify complex fractions Solve equations and applications with equations containing rational expressions Graphing linear equations and inequalities in two variables Introduce the rectangular coordinate system Find the slope of a line Discuss the point-slope, slope-intercept and two-point equations for a line Graph linear inequalities Introduce the concept of functions and function notation Solve systems of linea r equations and inequalities Solve systems of linear equations by graphing, substitution and elimination methods Solve selected applied problems involving systems of equations Solve systems of inequalities and show the solutions graphically Introduce basic operations involving radicals and solve equations involving simple radicals Solve quadratic equations Introduce graphs of parabolas Identify the coordinates for the x and y intercepts Identify the coordinates at the vertex

Method(s) of Instruction

- Lecture (02)

Instructional Techniques

The primary mode of instruction is the lecture/demonstration method. Some sections are laboratory based using a variety of instructional methods including textbooks, video presentations and computer based materials. Some sections may be taught using cooperative learning strategies. The Success Center supports instructions through the use of the following methodologies; Workshops designed by faculty Study groups designed by faculty Directed/Diagnostic learning activities designed by faculty PASS (Peer Assisted Study Session) Program. Individual or drop-in tutoring. These methodologies may be used to support any of the stated course objectives and can be determined by the instructor or recommended by the instructional associate.

Reading Assignments

Students will spend on average 1 hour per week reading from assigned textbook.

Writing Assignments

Students will spend on average 1 hour per week on writing assignments.

Out-of-class Assignments

Students will spend on average 6 hours per week on homework assignments and test preparation.

Demonstration of Critical Thinking

Grades are determined by performance on quizzes and exams.
Some instructors may also include grades on homework, cooperative assignments or cooperative learning sessions. A comprehensive final exam is part of this course.The Success Center participation may not exceed 10% of the total grade for the course. Instructors will be provided with verification of students participation and progress in Success Center assignments.Critical thinking will be evaluated through a problem-solving approach. Writing is encouraged throughout the course but is not necessarily a part of the grading or exams.

Required Writing, Problem Solving, Skills Demonstration

Writing is encouraged throughout the course but is not necessarily a part of the grading or exams.

Eligible Disciplines

Mathematics: Master's degree in mathematics or applied mathematics OR bachelor's degree in either of the above AND master's degree in statistics, physics, or mathematics education OR the equivalent. Master's degree required.

Textbooks Resources

1. Required Miller, et al. Beginning Algebra, 6th ed. McGraw Hill, 2022

Other Resources

1. Individual instructors may encourage student solution manuals or study guides but they are not required for this course. Many instructors recommend that their students purchase scientific calculators. 2. Other appropriate textbook as chosen by faculty.