MATH A030: INTERMEDIATE ALGEBRA

Item	Value
Curriculum Committee Approval Date	12/08/2021
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: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

Topics covered will be functions, linear and quadratic equations, curve sketching, exponents, rational expressions, rational exponents, logarithms, variations, systems of equations, determinants, Cramer's Rule, and conic sections. A minimum of five arranged hours of supplemental learning per semester in the Success Center is suggested. Enrollment Limitation: MATH A045; students who complete MATH A030 may not enroll in or receive credit for MATH A045. PREREQUISITE: MATH A010 or appropriate placement. Not Transferable.

Course Level Student Learning Outcome(s)

1. Solve linear and nonlinear equations and inequalities by performing mathematical operations on complex numbers, algebraic, exponential and logarithmic expressions.
2. Solve systems of linear equations and inequalities.
3. Evaluate and analyze the characteristics of different types of functions.
4. Solve mathematical application problems by applying critical thinking skills and express the solution in oral or written form.

Course Objectives

• 1. Simplify expressions involving exponents and polynomials.
• 2. Factor polynomials.
• 3. Solve and graph linear equations and inequalities in one variable.
• 4. Solve and graph linear equations and inequalities in two variables.
• 5. Solve systems of equations using addition, substitution, and Cramers Rule.
• 6. Simplify rational expressions and solve rational equations.
• 7. Understand and use the real and complex number systems.
• 8. Simplify expressions involving rational exponents and roots.
• 9. Demonstrate a working knowledge of relations and functions.
• 10. Solve and graph quadratic equations and inequalities.
• 11. Graph conics.
• 12. Solve narrative exercises.
• 13. Demonstrate a working knowledge of mathematical terminology.

Lecture Content

It is imperative that instructors cover all topics listed below in order to prepare the students for classes including: Math A100, Math A104, Math A120, Math A130, Math A154, or Math A160. The instructor shall determine the order and sequence of topics to be covered in terms of adhering to the Official Course Outline of Record. Algebraic terminology and review of basic concepts Solving elementary equations and inequalities Linear with selected applications Literal Absolute value Graphs, relations and functions Find the slope and distance between two points Use the relationship between the slopes of parallel and perpendicular lines Sketch linear equations Find the equation of a line Introduce relations and functions Evaluate composite functions Solve systems of linear equations and inequalities Equations involving two or three variables using substitution and elimination Evaluate determinants and use Cramers Rule for two or three variables Selected applied exercises using two or three variables Systems of inequalities in two variables by graphing Polynomials and factoring Factor: common factors. Quadratic form, the sum and difference of cubes, grouping Optional: Manipulate monomials with variables as exponents Solve quadratic equations and equations in quadratic form using factoring Solve selected applied exercises involving factorable quadratic equations Rational expressions Combine and simplify algebraic fractions including complex fractions Solve equations involving rational expressions including literal equations Solve selected applied exercises involving fractional equations Divide polynomials Radicals and rational ex ponents Define and perform operations on radical expressions and rational exponents Solve equations involving radicals Solve selected applied exercises Introduce complex numbers Solve quadratic equations and inequalities Solve equations by factoring, completing the square, quadratic formula Selected applied exercises involving quadratic equations Optional: Quadratic inequalities, fractional inequalities Quadratic functions Graph parabolic functions including finding the vertices Solve selected applied variation, and maximum and minimum exercises Exponential and logarithmic functions Convert between exponential and logarithmic forms Sketch exponential and logarithmic functions Find common and natural logarithms Solve exponential and logarithmic equations Solve selected applications exercises Conic sections Identify and graph circles, ellipses and hyperbolas centered at the origin Solve nonlinear systems of equations Graph nonlinear inequalities (Optional) Sequences and Series Arithmetic Sequences and Series Geometric Sequences and Series Binomial Theorem

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

1 hour

Writing Assignments

Writing is encouraged throughout the course but is not necessarily a part of the grading or exams. 1 hour

Out-of-class Assignments

6 hours

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. 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.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.

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: Masters degree in mathematics or applied mathematics OR bachelors degree in either of the above AND masters degree in statistics, physics, or mathematics education OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Bittinger Ellenbogen. . Intermediate Algebra "Concepts and Applications, 8TH ed. Boston: Pearson , 2010

Other Resources

1. The required texts are listed below. Only one text is used in each course, at the choice of the instructor. 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.