MAT1033 Course Description

Intermediate Algebra..(3) (P)

Description: This course includes the study of quadratic equations, rational exponents and their properties, radicals, rational expressions and equations, factoring (review), graphing linear and quadratic functions and interpreting their graphs, solving systems of linear equations and inequalities, and applications.

Prerequisite: MAT0055, MAT0056, or MAT0057 with a grade of "A"; OR MAT 0022 or MAT 0028 with a grade of "C" or better; OR the equivalent; OR a documented decision by an SB1720 exempt student stating they have opted into college level classwork, intentionally bypassing any recommended developmental prerequisites.

Rationale: In an increasingly complex world, mathematical thinking, understanding, and skill are more important than ever. This course provides students with skills and proficiency in under-standing concepts needed for College Algebra, and the opportunity to learn to communicate and reason mathematically.

Impact Assessment: *Intermediate Algebra* provides students with skills for proficiency in quantitative and analytical description of these topics. The course applies as elective credit toward the General Education requirements for an Associate of Arts degree but does ***not*** satisfy a mathematics requirement. It is a prerequisite for MAC1105, MGF1106, MGF1107, MGF1121 & STA2023, and as well as other science, nursing, and business courses.

Broad Course Objectives: This course supports the following goals of the Math Department:

- Engage students in sound mathematical thinking and reasoning. This should include students finding patterns, generalizing, and asking/answering relevant questions.
- Provide a setting that prepares students to read and learn mathematics on their own.
- Explore multiple representations of topics including graphical, symbolic, numerical, oral, and written. Encourage students to make connections among the various representations to gain a richer, more flexible understanding of each concept.
- Analyze the structure of real-world problems and plan solution strategies. Solve the problems using appropriate tools.
- Develop a mathematical vocabulary by expressing mathematical ideas orally and in writing.
- Enhance and reinforce the student's understanding of concepts through the use of technology when appropriate.

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As a result of successfully completing MAT1033, students should be able to demonstrate the following:

- Analyze/interpret quantitative data verbally, graphically, symbolically and numerically.

- Communicate quantitative data verbally, graphically, symbolically and numerically.

- Appropriately integrate technology into mathematical processes.

- Use mathematical concepts in problem-solving through integration of new material and modeling.

Topical Outline with Specific Course Objectives:

I. *Review*

    A. Demonstrate an ability to factor algebraic expressions into primes using techniques of removing common factors, and factoring the difference of squares and trinomials.

    B. Use the properties of inequalities and equivalent inequalities to solve linear inequalities in one variable and express the solutions graphically or in interval notation.

II. *Rational Expressions and Equations*

    A. Evaluate rational expressions, and use prime factorization to reduce simple rational expressions (decreased emphasis).

    B. Use the properties of equalities and equivalent equalities to solve rational equations; apply to word problems involving ratios and proportions.

III. *Radicals and Rational Exponents*

    A. Demonstrate the relationship between exponents and radicals.

    B. Use the properties of radicals to simplify simple radicals.

    C. Use the properties of equality to solve equations involving one radical expression.

IV. *Quadratic Equations*

    A. Recognize a quadratic equation; choose and apply the most efficient method to solve it.

    B. Apply skills to word problems involving quadratic equations.

V. *Linear Equations and Inequalities in Two Variables*

    A. Use tables and graphs as tools to interpret expressions, equations, and inequalities.

    B. Locate the x and y intercepts graphically and algebraically and interpret them in the context of the problem

    C. Explain and determine the slope of a line as the ratio of change in the dependent variable with respect to change in the independent variable.

VI.   *Systems of Linear Equations and Inequalities and their Graphs*

     A. Connect the solution set of a system of two linear equations in two variables with the graphs of the two equations.

     B. Connect the solution set of a system of two linear inequalities in two variables with the graphs of the two inequalities.

VII.   *Introduction to Functions*

     A. Recognize functions in table, graph, equation or verbal form.

     B. Understand that for a function one input value results in one output value.

     C. Determine the acceptability of a value to be used for the independent variable in an equation that defines a function.

     D. Determine the domain and range of a relation from a graph.

     E. Use and understand functional notation.

VIII.   *Linear Functions and Their Applications*

     A. Express linear and quadratic functions in table, graph, equation, or verbal form.

     B. Make connections between the parameters of a function and the behavior of the function.

     C. Recognize that a variety of problem situations can be modeled by the same type of function.

     D. Use patterns and functions to represent and solve problems.

     E. Extract and interpret information presented in a graph.

Evaluation: Each instructor will determine the specific criteria for determining the final course grade. These criteria will be delineated in the first day handout provided to each student. Each instructor will give a ***common*** comprehensive final exam during the assigned final exam period that will account for 25% of the course grade.

Commonality: All instructors will use the same textbook and cover all topics in the topical outline and give a common final exam. A graphing calculator will be required for this course. Either the TI-83 or the TI-84 line of calculators is recommended; any other graphing calculator will need to be approved by the instructor.