MTH 099 - Intermediate Algebra
Course Syllabus

Course Description: This non-credit course is designed to prepare students to be successful in SFA's freshman entry-level credit math classes (MTH 110, 127, 138, or 143.) There is some overlap of topics with MTH 098, but the treatment here is more in-depth. Topics include properties of real numbers, techniques of algebraic simplification, solving equations and inequalities, sets, functions and graphs, polynomials, rational expressions, radicals, and various applications. Discussion and instruction in proper mathematical organization, communication, and math-specific study skills is incorporated throughout the course. Graphing calculators are not permitted. Students must show all work.

<u>**Course Outline:**</u>   <u>Approximate Time Spent:</u>

• Set of real numbers, inequalities, absolute value   15%
• Operations with real numbers
• Exponential notation and order of operations
• Translating and evaluating algebraic expressions
• Equivalent fractions, laws of real numbers
• Combining like terms, removing parentheses
• Properties of exponents

• Solving linear equations   20%
• Formulas and applications
• Applications of linear equations and problem solving
• Sets, intersection, union, interval notation, and set-builder notation
• Solving inequalities
• Solving compound inequalities

• Graphs of linear and nonlinear equations   20%
• Functions and graphs
• Finding domain and range
• Graphs and slopes of linear functions
• Methods of graphing, horizontal and vertical lines, parallel and perpendicular lines
• Finding equations of lines, applications

• Introduction to polynomials and polynomial functions   25%
• Multiplication of polynomials
• Introduction to factoring
• Factoring trinomials: $x^2 + bx + c$
• Factoring trinomials: $ax^2 + bx + c,\ a \neq 1$
• Factoring perfect square trinomials and differences of squares
• General strategies for factoring
• Solving polynomial equations, applications

• Multiplying, dividing, and simplifying rational expressions and functions   10%
• LCMs, LCDs, addition and subtraction of rational expressions
• Solving rational equations

<u>Approximate time spent</u>

• Radical expressions and functions   10%
• Graphs of radical expressions
• Adding and multiplying radical expressions

<u>Student Learning Outcomes (SLO):</u> At the end of MTH 099, a student who has studied and learned the material should be able to:

1. Recognize, name, and apply properties of real numbers.
2. Utilize algebraic properties to simplify and rewrite expressions.
3. Investigate the properties of exponents.
4. Solve linear and quadratic equations.
5. Solve applications involving linear and quadratic equations.
6. Solve linear inequalities and compound linear inequalities.
7. Perform operations on sets, and use proper set notation.
8. Investigate the characteristics of linear functions and their graphs.
9. Write linear models using real-life data.
10. Recognize shapes of non-linear functions by their equations and graph them.
11. Identify functions and use function notation.
12. Find the domain and range of functions from formulas and graphs.
13. Perform operations with polynomial expressions including factoring.
14. Perform operations on rational expressions.
15. Solve rational equations.
16. Simplify and perform operations on radical expressions.
17. Utilize algebraic concepts to strengthen problem-solving skills.
18. Write correct mathematical definitions using complete sentences.
19. Organize and communicate in proper mathematical form all of the steps involved in the topics above.
20. Create and use note cards, study pages, mind maps, self-quizzes, and other study techniques.