College of Applied Science
Department of Mathematics, Physics, and Computing Technology
Center for Access and Transition

42-MATH-101 Elementary Algebra III Course Content

Book: *Intermediate Algebra* Ninth Edition by Lial, Hornsby, and McGinnis

- Faculty covering this course may wish to do a quick review of Chapter 5 operations on polynomials. Students having difficulty with this may need to go into Elementary Algebra II.
- Students may use a scientific calculator. A graphing calculator may not be used.
- Cell phones may not be used as calculators at any time.
- Applied problems should be stressed.

Module I

Chapter 6: Factoring
(Stress to the students that a great deal of practice is required to become proficient in factoring.)
6.1 Greatest Common Factors; Factoring by Grouping

- The first step in factoring a polynomial is to find the greatest common factor (if one exist).
- Factor by grouping – students should be able to group the terms, factor within the groups and then factor the entire polynomial.

6.2 Factoring Trinomials

- Factor trinomials when the coefficient of the squared term is 1.
- Factor trinomials when the coefficient of the squared term is not 1.
- Emphasize the importance of this section as it relates to subsequent sections.

6.3 Special Factoring

- Factor the Difference of Squares
- Factor Perfect Squares Trinomial
- Factor the Difference and Sum of Cubes

6.4 A General Approach to Factoring

- Summarize and apply the factoring methods presented in the preceding sections.

6.5 Solving Equations by Factoring

- Learn and use the zero-factor property.
- Solve applied problems

Module II

Chapter 7: Rational Expressions and Functions
7.1 Rational Expressions and Functions; Multiplying and Dividing

- Define rational functions and describe their domains.
- Write rational expressions in lowest terms.
- Factor both numerator and denominator to find their greatest common factor (GCF).
- Apply the fundamental property.

7.2 Adding and Subtracting Rational Expressions

- Find the least common denominator.
- Add and subtract rational expressions with different denominators.

7.3 Complex Fractions

- Simplify complex fractions by simplifying the numerator and denominator
- Simplify complex fractions by multiplying by a common denominator

7.4 Equations with Rational Expressions and Graphs

- Determine the domain of a rational equation.
- Solve rational equations.

7.5 Applications of Rational Expressions

- Find the value of an unknown variable in a formula.
- Solve a formula for a specified variable.
- Solve applications using proportions.
- Solve distance, rate time and work rates, applications.

Module III

Chapter 8: Roots, Radicals, and Root Functions
8.1 Radical Expressions and Graphs

- Graph a function defined with radicals. Graph by creating a table of values and give the domain and range.
- Find roots of numbers with and with out a calculator.

8.2 Rational Exponent

- Use exponential notation for the nth root.
- Convert between radicals and rational exponents.
- Use the rules for exponents with rational exponents.

8.3 Simplifying Radical Expressions

- Use the product and quotient rule for radicals.
- Simplify radicals
- Simplify products and quotients of radicals with different indexes.
- Emphasize Pythagorean formula using word problems.

8.4 Adding and Subtracting Radical Expressions

- Recognize that radicals with the same index and the same radicand are like radicals and may be added or subtracted.

8.5 Multiplying and Dividing Radical Expressions

- Multiply radical expressions.
- Rationalize denominators with one radical term and with binomials involving radicals.

8.6 Solving Equations with Radicals

- Solve radical equations using the power rule.
- Recognize that when the power rule is used to solve an equation, every solution of the new equation must be checked in the original equation.
- Solving radical equations with indexes greater than 2.

8.7 Complex Numbers

- Know that for if b is a positive real number that $\sqrt{-b} = i\sqrt{b}$
- Adding, subtracting and multiplying complex numbers. (if time permits)

Module IV

Chapter 9: Quadratic Equations, Inequalities, and Functions

9.1 The Square Root Property and Completing the Square

- Solve quadratic equations of the form $(ax+b)^2 = c$ by using the square root property.
- Solve quadratic equations by completing the square. (including those where the solution are not real numbers)

9.2 The Quadratic Formula

- Solve the quadratic equations using the quadratic formula (the formula needs to be memorized).

9.3 Equations Quadratic in Form

- Solve radical equations that lead to quadratic equations, stress application problems.
- Solve equations that are quadratic inform.

9.6 More about Parabolas; Applications

- Find the vertex of a parabola using $\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$
- Use quadratic functions to solve problems involving maximum or minimum value.

9.7 Quadratic and Rational Inequalities

- Solve polynomial and rational inequalities.
- Graph the solution and write it in interval notation.

The following progress will be general to accommodate any type of contact hours.

Week 1:

- Review from Chapter 5 formulas of product of the sum and difference of two terms and square of binomial
- Sections 6.1, 6.2, start 6.3

Week 2:

- Finish 6.3, 6.4 and 6.5

Week 3:

- Review Chapter 6. Test on Module I
- Section 7.1

Week 4:

- Sections 7.2, 7.3, 7.4.

Week 5:

- Sections 7.5
- Review Chapter 7. Test on Model 2
- Short review Chapter 5 – Rule of exponents

Week 6:

- Sections 8.1, 8.2 and start 8.3

Week 7:

- Finish 8.4, 8.5, 8.6 and 8.7

Week 8:

- Review Chapter 8. Test on Module III.
- Sections 9.1 and 9.2

Week 9:

- Sections 9.3, 9.6 and 9.7.

Week 10:

- Review Chapter 9. Test on Module IV
- Review for Final.