

Departmental Syllabus **Math 15 -- Intermediate Algebra**

Note: This course is taught on the UWP campus by faculty from Southwest Wisconsin Technical College. This course does not carry UWP credit.

Textbook: Intermediate Algebra (Seventh Edition), by Bittinger and Ellenbogen

Prerequisites: Math 10 with a grade of “C” or better or mathematics proficiency level of 10 or above.

Calculators: Scientific calculator required. (NOTE: On occasion, individual instructors may restrict the use of any type of calculator).

Course Description: Fundamental operations, factoring, fractions, equations, functions, graphing, exponents and radicals, linear equations, systems of equations, inequalities, polynomials, rational expressions, quadratics, and arithmetic and geometric sequences.

Topics and sections to be covered:

Chapter 1 – Algebra and Problem Solving

- 1.1 Some Basics of Algebra (brief review only)
- 1.2 Operations and Properties of Real Numbers (brief review only)
- 1.3 Solving Equations
- 1.4 Introduction to Problem Solving
- 1.5 Formulas, Models, and Geometry
- 1.6 Properties of Exponents
- 1.7 Scientific Notation

Chapter 2 – Graphs, Functions, and Linear Equations

- 2.1 Graphs
- 2.2 Functions
- 2.3 Linear Functions: Slope, Graphs, and Models
- 2.4 Another Look at Linear Graphs
- 2.5 Other Equations of Lines
- 2.6 The Algebra of Functions

Chapter 3 – Systems of Linear Equations and Problem Solving

- 3.1 Systems of Equations in Two Variables
- 3.2 Solving by Substitution or Elimination
- 3.3 Solving Applications: Systems of Two Equations
- 3.4 Systems of Equations in Three Variables
- 3.5 Solving Applications: Systems of Three Equations

Chapter 4 – Inequalities and Problem Solving

- 4.1 Inequalities and Applications
- 4.2 Intersections, Unions, and Compound Inequalities (optional)
- 4.3 Absolute Value Equations and Inequalities (optional)
- 4.4 Inequalities in Two Variables

Chapter 5 – Polynomials and Polynomial Functions

- 5.1 Introduction to Polynomials and Polynomial Functions
- 5.2 Multiplication of Polynomials
- 5.3 Common Factors and Factoring by Grouping
- 5.4 Factoring Trinomials
- 5.5 Factoring Perfect-Square Trinomials and Differences of Squares
- 5.6 Factoring Sums or Differences of Cubes
- 5.7 Factoring: A General Strategy
- 5.8 Applications of Polynomial Equations

Chapter 6 – Rational Expressions, Equations, and Functions

- 6.1 Rational Expressions and Functions: Multiplying and Dividing
- 6.2 Rational Expressions and Functions: Adding and Subtracting
- 6.3 Complex Rational Expressions
- 6.4 Rational Equations
- 6.5 Solving Applications Using Rational Equations
- 6.6 Division of Polynomials
- 6.8 Formulas, Applications, and Variation

Chapter 7 – Exponents and Radicals

- 7.1 Radical Expressions and Functions
- 7.2 Rational Numbers as Exponents
- 7.3 Multiplying Radical Expressions
- 7.4 Dividing Radical Expressions
- 7.5 Expressions Containing Several Radical Terms
- 7.6 Solving Radical Equations
- 7.7 Geometric Applications
- 7.8 The Complex Numbers (optional)

Chapter 8 – Quadratic Functions and Equations

- 8.1 Quadratic Equations
- 8.2 The Quadratic Formula
- 8.3 Applications Involving Quadratic Equations
- 8.4 Studying Solutions of Quadratic Equations (optional)
- 8.5 Equations Reducible to Quadratic (optional)
- 8.6 Quadratic Functions and Their Graphs
- 8.7 More About Graphing Quadratic Functions

Chapter 11 – Sequences, Series, and the Binomial Theorem

- 11.1 Sequences and Series
- 11.2 Arithmetic Sequences and Series
- 11.3 Geometric Sequences and Series
- 11.4 The Binomial Theorem (optional)