352-H/352-CP ALGEBRA 2A

GRADE: 10 - 12

LEVEL: Honors and College Prep

CREDITS: 5

RECOMMENDED PREREQUISITE: 300B-H/301B-CP Algebra 1B and 321-H/321-CP Geometry

BASIC TEXT: Algebra II, Prentice Hall, 2004

REQUIRED MATERIALS: notebook, writing utensil, scientific calculator

COURSE DESCRIPTION:

This course is designed for college preparatory students. Instructional time will focus on four critical areas. Students will relate the arithmetic of rational expressions to arithmetic of rational numbers. They will continue their work with linear and quadratic functions and modeling techniques using a variety of functions. Students will also relate data display and summary statistics to probability (+) and explore a variety of data collection methods.

MISSION RELATED GOALS:

This class will provide the student with a variety of opportunities to demonstrate academic excellence and intellectual curiosity by communicating effectively, solving complex problems, and working with others toward a common goal.

STUDENT EXPECTATIONS FOR LEARNING ADDRESSED:

Students will be afforded opportunities to apply mathematical concepts to real-world applications. A variety of teaching methods will be used to foster an environment that promotes self-confidence and respect for others throughout the school and global community.

GENERAL PERFORMANCE OBJECTIVES:

The student will be able to:
1. Use properties of real numbers to evaluate expressions
2. Solve first degree equations and inequalities with one variable, including proportion, percent, number, and consecutive integer problems
3. Solve absolute value equations, literal equations, compound inequalities and absolute value inequalities
4. (+) Organize data into a matrix and perform addition, subtraction, scalar multiplication, and matrix multiplication
5. Add, subtract, multiply, divide and factor polynomials
6. Solve polynomial equations
7. Create and interpret a variety of graphs
8. Understand and use the concepts of relations and functions
9. Graph and write linear equations utilizing points, slope, or intercepts
10. Solve and graph systems of equations and inequalities
11. Use statistics to analyze data in a variety of ways.

MASSACHUSETTS CURRICULUM FRAMEWORK CONTENT STANDARDS: http://goo.gl/tv2ya

UNITS AND THEMES:

I.   Tools of Algebra   A-CED

II.	**Functions, Equations, & Graphs**	F-IF, F-BF-1, F-BF-3
III.	**Linear Systems**	A-REI-11, A-CED-1, A-CED-2, A-CED-3
IV.	**Quadratic Equations & Functions**	N-CN, A-REI-11, F-IF, F-LE
V.	**Rational Functions**	A-REI, A-APR-1, A-APR-11
VI.	**Polynomials & Polynomial Functions**	A-SSE-1, A-SSE-2, A-APR, A-CED, A- REI
VII.	**Piecewise Functions**	F-IF-7
VIII.	**Statistics**	S-ID, S-IC, S-MD
IX.	**Review, Midterm and Final**	

COURSE OUTLINE: (number of days are an approximation and may be adjusted by course demands)
Topics with (+) are included in 352-H.

I.   Tools of Algebra (5 days)

    A.   Solving Equations and Inequalities
    B.   Solving Literal Equations
    C.   Absolute Value Equations and Inequalities

II.   Functions, Equations, & Graphs (12 days)

    A.   Relations and Functions
    B.   Linear Equations
    C.   Using Linear Models
    D.   Absolute Value Functions & Graphs
    E.   Two-Variable Inequalities

III.   Solving Systems (8 days)

    A.   Graphing Systems of Equations
    B.   Solving Systems Algebraically
    C.   Systems of Inequalities
    D.   Problem Solving with Systems with 2 variables
    E.   Problem Solving with Systems in 3 variables

IV.   Quadratic Equations & Functions (20 days)

    A.   Modeling Data with Quadratic Functions
    B.   Properties of Parabolas
    C.   Translating Parabolas
    D.   Factoring Quadratic Expressions
    E.   Quadratic Equations
    F.   Complex Numbers
    G.   Quadratic Formula

V.   Rational Functions (9 days)

    A.   Simplifying Rational Expressions
    B.   Addition and Subtraction of Rational Expressions
    C.   Solving Rational Equations

VI.   Polynomials & Polynomial Functions (12 days)

    A.   Polynomial Functions
    B.   Polynomials & Linear Factors

    C.   Dividing Polynomials
    D.   Solving Polynomial Equations
    E.   Theorems about Roots of Polynomial Equations
    F.   Fundamental Theorem of Algebra
    G.   Applications of Solving Polynomial Equations

VII.   **Piecewise Functions** (4 days)

    A. Graphing Piecewise Functions in Linear & Quadratic Form
    B. Finding Piecewise Equations Given the Graph
    C. Evaluating Piecewise Functions Given a Coordinate

VIII.   **Statistics** (9 days)

    A. Graphical displays of distributions
    B. Measures of Central Tendency
    C. Using standard deviation and normal distributions to fit data
    D. Conduct and interpret sample surveys & experiments
    E. (+) Probability Distribution
    F. (+) Conditional Probablity
    G. (+) Binomial Distributions

IX.   **Review, Midterm and Final** (4 days)

SUGGESTED INSTRUCTIONAL STRATEGIES:

1.   Lecture
2.   Oral classroom practice
3.   Written exercises
4.   Group Work
5.   Projects
6.   Use of a variety of questioning techniques
7.   Board Work
8.   Scientific Calculator Activities
9.   Graphing Calculators

SUGGESTED INTERGRATED ACTIVITIES:

1.   Geometry based quadratic equation word problems
2.   Scientific variation word problems

USE OF TOOLS/TECHNOLOGY:

1.   Use of Smartboard
2.   Use of scientific and graphing calculators
3.   Use of computer laboratories and mobile labs

ASSESSMENT TECHNIQUES:

1.   Students will take free-response performance tests
2.   Students will answer questions orally
3.   Students will do written presentations at the board
4.   Homework evaluation
5.   Students will work in cooperative groups and report their results

6. Students will participate in classroom discussions