Instructor: Annie Franklin

Email: frankan@richmond.k12.ga.us

Phone: (706) 592-2089

Classroom: 321

Office Hours: 7:00am-2:55pm

Course Overview

Algebra I is a foundational course designed to help students develop strong mathematical reasoning and problem-solving skills. The course covers a wide range of algebraic concepts including linear, quadratic, and exponential functions, as well as systems of equations and inequalities. This course follows the Georgia Standards of Excellence (GSE) and prepares students for future studies in mathematics.

Course Objectives

By the end of this course, students will be able to:

Interpret and analyze functions to understand relationships between quantities.

Solve linear equations and inequalities, and understand their graphical representations.

Analyze and solve quadratic equations and inequalities.

Explore and interpret exponential functions and their applications.

Understand the concept of a function and use function notation.

Solve systems of linear equations and inequalities.

Use mathematical modeling to solve real-world problems.

Develop fluency in operations with polynomials and rational expressions.

Course Outline

Unit 1: Algebraic Foundations (2 weeks)

Standards: MGSE9-12.A.SSE.1, MGSE9-12.A.CED.1

Topics:

Properties of real numbers

Simplifying algebraic expressions

Solving basic equations and inequalities

Order of operations

Assessment: Quiz on algebraic foundations

Unit 2: Linear Equations and Inequalities (4 weeks)

Standards: MGSE9-12.A.REI.3, MGSE9-12.A.REI.5

Topics:

Solving multi-step linear equations

Graphing linear equations

Writing linear equations in different forms (slope-intercept, point-slope, standard)

Solving linear inequalities and graphing their solutions

Assessment: Unit test on linear equations and inequalities

Unit 3: Functions (3 weeks)

Standards: MGSE9-12.F.IF.1, MGSE9-12.F.IF.2

Topics:

Understanding the concept of a function

Function notation

Evaluating and interpreting functions

Domain and range

Linear functions and their graphs

Assessment: Quiz on functions and their properties

Unit 4: Systems of Equations and Inequalities (3 weeks)

Standards: MGSE9-12.A.REI.6, MGSE9-12.A.REI.12

Topics:

Solving systems of linear equations by graphing, substitution, and elimination

Solving systems of linear inequalities

Applications of systems of equations and inequalities

Assessment: Unit test on systems of equations and inequalities

Unit 5: Exponents and Exponential Functions (4 weeks)

Standards: MGSE9-12.F.LE.1, MGSE9-12.F.LE.2

Topics:

Properties of exponents

Simplifying expressions with exponents

Exploring exponential growth and decay

Graphing exponential functions

Applications of exponential functions

Assessment: Quiz on exponents and exponential functions

Unit 6: Polynomials and Factoring (4 weeks)

Standards: MGSE9-12.A.SSE.2, MGSE9-12.A.APR.1

Topics:

Adding, subtracting, and multiplying polynomials

Factoring trinomials and special products

Solving quadratic equations by factoring

Applications of polynomial functions

Assessment: Unit test on polynomials and factoring

Unit 7: Quadratic Equations and Functions (5 weeks)

Standards: MGSE9-12.F.IF.7, MGSE9-12.A.REI.4

Topics:

Solving quadratic equations by factoring, completing the square, and the quadratic formula

Graphing quadratic functions and analyzing their properties (vertex, axis of symmetry)

Applications of quadratic functions

Assessment: Quiz on quadratic equations and functions, performance task

Unit 8: Radical Expressions and Equations (3 weeks)

Standards: MGSE9-12.N.RN.2, MGSE9-12.A.REI.2

Topics:

Simplifying radical expressions

Performing operations with radicals

Solving radical equations

Applications of radical expressions

Assessment: Unit test on radical expressions and equations

Unit 9: Rational Expressions and Equations (3 weeks)

Standards: MGSE9-12.A.APR.6, MGSE9-12.A.REI.2

Topics:

Simplifying rational expressions

Performing operations with rational expressions

Solving rational equations

Applications of rational expressions

Assessment: Quiz on rational expressions and equations

Final Review and Exam (2 weeks)

Comprehensive review of all units

Assessment: Final exam covering all course content

Grading Policy

Homework: 10%

Quizzes: 20%

Unit Tests: 40%

Projects/Performance Tasks: 20%

Final Exam: 10%

Materials Needed

Algebra I textbook: [Textbook Title]

Notebook or binder with graph paper

Scientific calculator

Pencils, erasers, and highlighters

Classroom Expectations

Arrive on time and prepared for class.

Engage actively in lessons, discussions, and group activities.

Complete all assignments by the due dates.

Show respect to peers, the instructor, and classroom materials.

Adhere to all school rules and guidelines.

Attendance Policy

Regular attendance is vital for mastering the material in this course. Students are responsible for making up any missed work and should consult the instructor for assistance if needed.

Academic Integrity

Academic honesty is expected at all times. Cheating, plagiarism, and other forms of dishonesty will result in disciplinary action as per the school’s policies.

Extra Help

Students are encouraged to seek help when needed. Please make use of office hours, request additional help, or attend any available tutoring sessions.

Parent/Guardian Communication

Progress updates will be shared regularly through [preferred method, e.g., email, online portal]. Parents and guardians are welcome to contact the instructor with any questions or concerns.

This syllabus outlines the structure and expectations for a high school Algebra I course aligned with the Georgia Standards of Excellence, providing students with the foundation they need for future success in mathematics.

Instructor: Annie Franklin

Email: frankan@richmond.k12.ga.us

Phone: (706) 592-2089

Classroom: 321

Office Hours: 7:00am-2:55pm

**Course Overview**

Advanced Algebra, also known as Algebra II, builds on concepts learned in Algebra I and Geometry. This course covers more complex algebraic concepts, including functions, polynomials, rational expressions, logarithms, sequences, and probability. The course is designed to prepare students for further studies in mathematics, including Pre-Calculus and beyond, following the Georgia Standards of Excellence (GSE).

**Course Objectives**

By the end of this course, students will be able to:

1. Analyze and graph various types of functions, including linear, quadratic, polynomial, exponential, and logarithmic.
2. Solve complex equations and inequalities involving polynomials, rational expressions, and radicals.
3. Understand the behavior and characteristics of functions and their inverses.
4. Use systems of equations and inequalities to model real-world situations.
5. Explore sequences and series, including arithmetic and geometric sequences.
6. Understand and apply the principles of probability and statistics.
7. Perform operations with matrices and use them to solve systems of equations.
8. Investigate the properties and applications of complex numbers.

**Course Outline**

**Unit 1: Functions and Their Graphs (4 weeks)**

* **Standards:** MGSE9-12.F.IF.4, MGSE9-12.F.BF.1
* **Topics:**
* Understanding the concept of a function and function notation
* Domain and range
* Transformations of functions (shifts, reflections, stretches, compressions)
* Graphing linear, quadratic, and absolute value functions
* Inverses of functions
* **Assessment:** Quiz on functions and their graphs, performance task

**Unit 2: Quadratic Functions and Complex Numbers (4 weeks)**

* **Standards:** MGSE9-12.N.CN.1, MGSE9-12.A.REI.4
* **Topics:**
* Solving quadratic equations by factoring, completing the square, and using the quadratic formula
* Complex numbers and operations with complex numbers
* Graphing quadratic functions and analyzing their properties (vertex, axis of symmetry, direction of opening)
* Applications of quadratic functions
* **Assessment:** Unit test on quadratic functions and complex numbers

**Unit 3: Polynomial Functions (4 weeks)**

* **Standards:** MGSE9-12.A.APR.2, MGSE9-12.A.APR.3
* **Topics:**
* Polynomial functions and their end behavior
* Adding, subtracting, multiplying, and dividing polynomials
* Factoring polynomials and solving polynomial equations
* The Remainder and Factor Theorems
* Graphing polynomial functions
* **Assessment:** Quiz on polynomial functions, performance task

**Unit 4: Rational Expressions and Functions (4 weeks)**

* **Standards:** MGSE9-12.A.APR.7, MGSE9-12.A.REI.2
* **Topics:**
* Simplifying rational expressions
* Performing operations with rational expressions
* Solving rational equations and inequalities
* Graphing rational functions and analyzing asymptotes
* Applications of rational functions
* **Assessment:** Unit test on rational expressions and functions

**Unit 5: Exponential and Logarithmic Functions (4 weeks)**

* **Standards:** MGSE9-12.F.LE.4, MGSE9-12.F.BF.5
* **Topics:**
* Exploring exponential growth and decay
* Solving exponential equations
* Introduction to logarithms and the relationship between logarithms and exponents
* Properties of logarithms and solving logarithmic equations
* Applications of exponential and logarithmic functions
* **Assessment:** Quiz on exponential and logarithmic functions, performance task

**Unit 6: Systems of Equations and Inequalities (3 weeks)**

* **Standards:** MGSE9-12.A.REI.6, MGSE9-12.A.REI.7
* **Topics:**
* Solving systems of linear equations in two and three variables
* Solving systems of linear inequalities
* Using matrices to solve systems of equations
* Applications of systems of equations and inequalities
* **Assessment:** Unit test on systems of equations and inequalities

**Unit 7: Sequences and Series (3 weeks)**

* **Standards:** MGSE9-12.F.IF.3, MGSE9-12.A.SSE.4
* **Topics:**
* Arithmetic sequences and series
* Geometric sequences and series
* Recursive formulas
* Applications of sequences and series
* **Assessment:** Quiz on sequences and series

**Unit 8: Probability and Statistics (3 weeks)**

* **Standards:** MGSE9-12.S.ID.4, MGSE9-12.S.CP.1
* **Topics:**
* Probability rules and counting methods
* Independent and dependent events
* Conditional probability
* Introduction to statistics: measures of central tendency, dispersion, and data analysis
* Applications of probability and statistics
* **Assessment:** Unit test on probability and statistics

**Unit 9: Trigonometric Functions (Optional or Extended Content) (4 weeks)**

* **Standards:** MGSE9-12.F.TF.1, MGSE9-12.F.TF.2
* **Topics:**
* Introduction to trigonometric functions
* Graphing sine, cosine, and tangent functions
* Applications of trigonometry in solving right triangles
* Exploring the unit circle
* **Assessment:** Quiz on trigonometric functions, performance task

**Final Review and Exam (2 weeks)**

* Comprehensive review of all units
* **Assessment:** Final exam covering all course content

**Grading Policy**

* **Homework:** 10%
* **Quizzes:** 20%
* **Unit Tests:** 40%
* **Projects/Performance Tasks:** 20%
* **Final Exam:** 10%

**Materials Needed**

* Advanced Algebra textbook: [Textbook Title]
* Notebook or binder with graph paper
* Scientific or graphing calculator
* Pencils, erasers, and highlighters

**Classroom Expectations**

* Be punctual and prepared for each class.
* Engage actively in discussions, group work, and class activities.
* Submit assignments on time and complete them to the best of your ability.
* Show respect to classmates, the teacher, and all classroom materials.
* Follow all school rules and policies.

**Attendance Policy**

Regular attendance is essential for success in this course. Students are responsible for catching up on any missed work and seeking help if necessary.

**Academic Integrity**

Integrity is expected at all times. Cheating, plagiarism, and any form of academic dishonesty will result in disciplinary action as outlined by school policy.

**Extra Help**

If you need extra help, please make use of office hours or schedule additional time with the instructor. Tutoring may also be available through the school.

**Parent/Guardian Communication**

Progress reports will be provided regularly. Parents and guardians are encouraged to communicate with the instructor regarding any questions or concerns.

This syllabus provides a comprehensive overview of the Advanced Algebra (Algebra II) course, aligned with the Georgia Standards of Excellence, and outlines the expectations, content, and assessments for the school year.