Algebra 2

Course Syllabus

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Course description

Goal: The main focus of Algebra 2 is on nonlinear functions, real numbers, complex numbers and multi-variable equations. Through the study of Algebra 2, the student will:

- Develop proficiency in using algebra to solve problems in everyday life.
- Expand his/her understanding of mathematical concepts.
- Improve his/her logical thinking skills
- Gain an understanding of algebra as a study of the structure of the systems of real and complex numbers.
- Gain an appreciation of how mathematics relates to the world of work.

Grade Level: predominately 10^{th}, but open to grades 11-12

Prerequisites: Successful completion of Algebra 1

Topics covered: by section/topic (Glencoe *Algebra2* © 2005)

Chapter 1 First Degree Equations and Inequalities

1.1 Expressions and Formulas

1.2 Properties of Real Numbers

1.3 Solving Equations

1.4 Solving Absolute Value Equations

1.5 Solving Inequalities

1.6 Solving Compound and Absolute Value Inequalities

Chapter 2 Linear Relations and Functions

2.1 Relations and Functions

2.2 Linear Equations

2.3 Slope

2.4 Writing Linear Equations

2.5 Modeling Real-World Date: Using Scatterplots

2.6 Special Functions

2.7 Graphing Inequalities

Chapter 3 Systems of Equations and Inequalities

3.1 Solving Systems of Equations by Graphing

3.2 Solving Systems of Equations Algebraically

3.3 Solving Systems of Inequalities by Graphing

3.4 Linear Programming

3.5 Solving Systems of Equations in Three Variables

Chapter 4 Matrices

4.1 Introduction to Matrices

4.2 Operations With Matrices

4.3 Multiplying With Matrices

4.4 Transformations With Matrices

4.5 Determinants

Chapter 5 Polynomials

5.1 Monomials

5.2 Polynomials

5.3 Dividing Polynomials

5.4 Factoring Polynomials

5.5 Roots of Real Numbers

5.6 Radical Expressions

5.7 Rational Exponents

5.8 Radical Equations and Inequalities

5.9 Complex Numbers

Chapter 6 Quadratic Functions and Inequalities

6.1 Graphing Quadratic Functions

6.2 Solving Quadratic Equations by Factoring

6.3 Completing the Square

6.4 The Quadratic Formula and the Discriminant

6.5 Analyzing Graphs of Quadratic Functions

6.6 Graphing and Solving Quadratic Inequalities

Chapter 7 Polynomial Functions

7.1 Polynomial Functions

7.2 Graphing Polynomial Functions

7.3 Solving Equations Using Quadratic Techniques

7.4 The Remainder and Factor Theorems

7.5 Roots and Zeros

7.6 Rational Zero Theorem

7.7 Operation on Functions

7.8 Inverse Functions and Relations

7.9 Square Root Functions and Inequalities

Chapter 8 Conic Sections

8.1 Midpoint and Distance Formulas

8.2 Parabolas

8.3 Circles

8.4 Ellipses

8.5 Hyperbolas

8.6 Conic Sections

8.7 Solving Quadratic Systems

Instructional Philosophy:

All students can and should learn algebra. An algebraic way of thinking and problem solving is important for everyone. Algebra is often considered a "gateway" course because its content is necessary for further study in mathematics and the sciences. Students will be provided with as much help and support as possible to ensure success in the course. Students are urged to attend extra help study groups which meet weekly, and to seek extra help from the instructor whenever necessary.

Expectation: Students will be expected to meet all the course goals by demonstrating their understanding of the basic concepts of each unit/area/topic. In order to pass the course, students must attain a minimum grade of 70%.

Delivery Method: Class activities will include lecture presentations, teacher-student discussions, small group instruction, individual instruction, question and answer sessions, demonstrations, hands-on activities, guided practice, and oral exercises. Written assignments will include problem sets, quizzes, test, projects, and short essays.

Assessment: Students will be assessed regularly through the use of homework, daily quizzes, unit tests, and chapter quizzes. Bonus points can be earned through the completion of optional extra-credit projects.

Course Standards- State Standards (9-12 Mathematics)

9-12.A.1 Use procedures to transform algebraic expressions

9-12.A.2 Use a variety of algebraic concepts and methods to solve equations and inequalities

9-12.A.3 Interpret and develop mathematical models

9-12.A.4 Describe and use properties and behaviors of relations, functions, and inverses

9-12.G.1 Use deductive and inductive reasoning to recognize and apply properties of geometric figures

9-12.G.2 Use properties of geometric figures to solve problems from a variety of perspectives

9-12.M.1 Apply measurement concepts in practical applications

9-12.N.1 Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

9-12.N.2 Apply operations within the set of real numbers.

9-12.S.1 Use statistical models to gather, analyze, and display data to draw conclusions

9-12.S.2 Apply the concepts of probability to predict events/outcomes and solve problems.

Course projects:

Students will complete one or more PowerPoint projects demonstrating linear and quadratic functions in their environment.

Assessment Plan & Grading Scale

Grading Scale Description of Work

A 94-100% Consistently demonstrates an exceptional level of quality of work and effort. Has all work in on time and completed to exceed expectations. Shows mastery in evaluating, synthesizing, and applying the knowledge.

B 87-93% Consistently demonstrates proficient knowledge with a good effort and quality of work. All assignments are completed on time. Demonstrates the ability to evaluate, analyze, synthesize and apply the principles.

C 80-86% Demonstrates proficient knowledge and the ability to apply knowledge. Work shows average effort. A few assignments may be missing or late.

D 70-79% Work shows minimal effort and some late assignments. Demonstrates a basic understanding of recalling or comprehending knowledge.

F 69% and below Understanding is below basic. Work is of poor quality and does not meet standards or expectations.

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