Course Overview

Middle School | Algebra II - *Last Updated on October 28, 2024*

DESCRIPTION

K-12 Content Area | Mission & Philosophy Statement

- With confidence and perseverance, young people can tackle complex and novel mathematical challenges, becoming skilled problem solvers who take ownership over their learning process.
- Young people possess the ability to reason mathematically, make conjectures, solve problems and build understanding through effective dialogue and collaboration.
- Learners exhibit critical inquiry through the deliberate asking of questions and the integration of conceptual understanding, reasoning abilities, and procedural fluency.
- Strategically selecting materials, technology, and other resources support mathematical learning and aid in achieving mathematical goals.

Course Description

In the Algebra II course, students are invited to build upon their foundational mathematical knowledge, venturing into a deeper and more sophisticated exploration of algebraic principles. This academic journey is designed to significantly broaden their understanding of Algebra I, focusing on an array of advanced topics that serve as the bedrock for higher mathematical study and application. The areas of study include relations and functions, exponents and radicals, systems of linear equations and inequalities, rational expressions, radical and quadratic equations. Critical thinking skills are extended through the use of a variety of application problems, matrices, complex numbers, higher degree polynomials and rational exponents are presented.

Central to the curriculum is an in-depth study of the complex number system. Students will explore beyond the realm of real numbers, delving into the intricate behaviors and properties of complex numbers, a critical component for understanding advanced mathematical concepts. This exploration includes engaging with both the algebraic and geometric interpretations of complex numbers, providing a holistic view of their application and significance. The course also places a significant emphasis on the properties of linear and non-linear functions, extending students' knowledge beyond simple linear relationships to include a variety of non-linear forms. Through detailed examination of their graphs, students will learn to interpret and analyze the diverse behaviors of these functions, gaining insights into their practical applications. This includes understanding the nuances of equations and inequalities, where students will apply algebraic methods to solve problems involving both linear and non-linear relationships. A comprehensive exploration of statistics and probability is another cornerstone of the Algebra II curriculum. Students will delve into statistical methods and principles, learning to analyze data, calculate probabilities, and make predictions based on statistical models. This segment aims to equip students with the quantitative reasoning skills necessary for data interpretation in various contexts, including science, economics, and social sciences. Moreover, the curriculum introduces students to the concepts of matrices and determinants as powerful tools for solving systems of equations with multiple variables.

STANDARDS

Pennsylvania - High School - Keystone Algebra II

A2.1.1.1.1 A2.1.1.1.2 A2.1.1.2.1 A2.1.1.2.2 A2.1.2.1.1 A2.1.2.1.2 A2.1.2.1.3

A2.1.2.1.4 A2.1.2.2.1 A2.1.2.2.2 A2.1.3.1.1 A2.1.3.1 A2.1.3.1.3 A2.1.3.1.2

A2.1.3.1.4 A2.1.3.2.2 A2.1.3.2.1 A2.2.1.1.1 A2.2.1.1.2 A2.2.2.1.1 A2.2.1.1.4

A2.2.1.1.3 A2.2.2.1.2 A2.2.2.1.3 A2.2.2.2.1 A2.2.2.1.4 A2.2.3.1.1 A2.2.3.1.2

A2.2.3.2.1 A2.2.3.2.2 A2.2.3.2.3

COURSE OBJECTIVES

Specific objectives for this course are aligned to the Pennsylvania Core Standards for Mathematics and the Common Core State Standards for Mathematics as outlined in the Scope and Sequence for Algebra II.

ASSESSMENT TYPES

- Diagnostic Assessments
- Formative Assessments
- Summative Assessments

SUGGESTED METHODS OF INSTRUCTION

Below is a list of suggested strategies for high-quality instruction in Mathematics:

- Instructional components outlines in the Framework for Teaching by Charlotte Danielson
- Teacher-centered instruction
- Inquiry-Based Instruction
- Small Group Instruction
- Cooperative Learning
- Student-Centered/Constructivist Approach
- Project-Based Learning
- Flipped Classroom

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RESOURCES

District Approved Program Resources	District Approved Supplemental Resources	District Approved Technology Resources
Algebra II. Prentice Hall (2011)		Desmos TI-Calculators 84 Central Calculator Activities Nearpod Khan Academy IXL Online Learning Platform Geogebra: Interactive Algebra Resources