**COURSE DESCRIPTION**

**Course Title:** Algebra II College Preparatory

**Course Number:** 00240

**Course Prerequisites:** Algebra I – College Preparatory

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| **Course Description:** | Algebra II College Preparatory is one of three courses in the academic sequence. Algebra concepts are an integral part of secondary math courses. This course expands on the foundation of algebraic theory that was begun in Algebra I. It uses practical problems to connect algebra to real world and apply the theory introduced in Algebra I, going from linear equations and inequalities to complex numbers. It includes the study and applications of quadratics including parabolas. This course is intended for students planning on pursuing higher education, particularly those whose primary interests are in fields that require a strong background in math or science. A grade of 75% or higher is earned in Algebra I or with a recommendation by the Algebra I teacher. A final exam is required.  |

**Suggested Grade Level**: Grades 9-12

**Length of Course:** Two Semesters

**Units of Credit:** 1

**PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:**

CSPG #50 Mathematics

To find the CSPG information, go to [CSPG](https://www.education.pa.gov/Educators/Certification/Staffing%20Guidelines/Pages/default.aspx)

**Certification verified by the WCSD Human Resources Department:** [x] Yes [ ] No

**WCSD STUDENT DATA SYSTEM INFORMATION**

**Course Level:** Academic

**Mark Types:** Check all that apply.

[x] F – Final Average [x] MP – Marking Period [x] EXM – Final Exam

**GPA Type**: [ ]  GPAEL-GPA Elementary [ ]  GPAML-GPA for Middle Level [x]  NHS-National Honor Society

[x]  UGPA-Non-Weighted Grade Point Average [x]  GPA-Weighted Grade Point Average

**State Course Code**: 02056

To find the State Course Code, go to [State Course Code](https://nces.ed.gov/forum/sced.asp), download the Excel file for *SCED*, click on SCED 6.0 tab, and chose the correct code that corresponds with the course.

**TEXTBOOKS AND SUPPLEMENTAL MATERIALS**

**Board Approved Textbooks, Software, and Materials:**

**Title:**  envision Algebra 2

**Publisher:** Pearson

**ISBN #:**  978-0-328-93156-9

**Copyright Date:** 2018

**WCSD Board Approval Date:** 6/29/2020

**Supplemental Materials:** Kutasoftware.com

**Curriculum Document**

**WCSD Board Approval:**

**Date Finalized:** 6/5/2020

**Date Approved:**  6/29/2020

**Implementation Year:** 2020-2021

**SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS**

The teacher shall make appropriate modifications to instruction and assessment based on a student’s Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

**SCOPE AND SEQUENCE OF CONTENT, CONCEPTS, AND SKILLS**

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| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Month Taught and Assessed for Mastery**  |
| Solve linear equations. | A1.1.2.1.1, A1.1.2.1.2, A1.1.2.1.3 | SeptemberOctober |
| Add and subtract polynomials | A1.1.1.5.1 | SeptemberOctober |
| Multiply two polynomials. | A1.1.1.5.1 | SeptemberOctober |
| Factor polynomials | A1.1.1.2.1, A1.1.1.5.2, A1.1.1.5.3 | SeptemberOctober |
| Graphing linear functions | A1.1.2.1.1, A1.1.2.1.3, A1.2.2.1.1, A1.2.2.1.2, A1.2.2.1.3, A1.2.2.1.4 | SeptemberOctober  |
| Identify a quadratic parent function. | A2.2.2.2.1, A2.2.1.1.1 | OctoberOctober |
| Understand the graph of f(x) = ax2. | A2.2.2.2.1,  | OctoberOctober |
| Interpret quadratic functions from tables. | A2.2.2.2.1 | OctoberOctober |
| Apply quadratic functions. | A2.2.2.2.1 | OctoberOctober |
| Compare the rate of change. | A2.2.2.2.1 | OctoberOctober |
| Understand the graph of g(x) = x2 + k. | A2.2.2.2.1 | OctoberOctober |
| Understand the graph of g(x) = (x – h)2. | A2.2.2.2.1 | OctoberOctober |
| Understand the graph of a(x – h)2 + k. | A2.2.2.2.1 | OctoberOctober |

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| Graph using vertex form. | A2.2.2.2.1 | OctoberOctober |
| Use vertex form to solve problems. | A2.2.2.2.1 | OctoberOctober  |
| Relate c to the graph of f(x) = ax2 + bx + c. | A2.2.2.2.1 | OctoberOctober |
| Graph a quadratic function in standard form. | A2.2.2.2.1 | OctoberOctober  |
| Compare properties of quadratic functions. | A2.2.2.2.1 | OctoberOctober |
| Analyze the structure of different forms of quadratic functions. | A2.2.2.2.1 | OctoberOctober |
| Understand domain and range. | A2.2.1.1.1, A2.2.1.1.3 | NovemberDecember |
| Find x- and y-intercepts. | A2.2.1.1.1 | NovemberDecember |
| Identify positive and negative intervals. | A2.2.2.2.1 | NovemberDecember |
| Identify where a function increases or decreases. | A2.2.2.2.1 | NovemberDecember |
| Understand average rate of change over an interval. | A2.2.2.2.1 | NovemberDecember |
| Translate a function. | A2.2.2.2.1 | NovemberDecember |
| Reflect a function across the x- or y-axis. | A2.2.2.2.1 | NovemberDecember |
| Understand stretches and compressions. | A2.2.2.2.1 | NovemberDecember |
| Graph a combination of transformations. | A2.2.2.2.1 | NovemberDecember |

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| Identify transformations from an equation. | A2.2.2.2.1 | NovemberDecember  |
| Write an equation from a graph. | A2.2.2.2.1 | NovemberDecember  |
| Solve a system of linear equations. (elimination, substitution ,and Cramer’s Rule) | A1.1.2.2.1, A1.1.2.2.2 | NovemberDecember  |
| Solve a system of linear inequalities. | A1.1.2.2.1, A1.1.2.2.2 | NovemberDecember  |
| Solve a system of equations in three variables | A1.1.2.2.1, A1.1.2.2.2 | NovemberDecember  |
| Transform a quadratic function. | A2.2.1.1.4, A2.2.2.1 | DecemberJanuary |
| Determine key features of a quadratic function. | A2.2.1.1.4, A2.2.2.1 | DecemberJanuary |
| Write an equation of a parabola. | A2.2.1.1.4, A2.2.2.1 | DecemberJanuary |
| Write an equation of a parabola given the graph. | A2.2.1.1.4, A2.2.2.1 | DecemberJanuary |
| Write an equation of a transformed function. | A2.2.1.1.4, A2.2.2.1 | DecemberJanuary  |
| Find the vertex of a quadratic function in standard form. | A2.2.1.1.4, A2.2.2.1 | DecemberJanuary |
| Graph a quadratic function in standard form. | A2.2.1.1.4, A2.2.2.1 | DecemberJanuary |
| Interpret the graph of a quadratic function. | A2.2.1.1.4, A2.2.2.1 | DecemberJanuary  |
| Factor a quadratic expression. | A2.1.3.2.2 | DecemberJanuary |
| Relate factors to zeros of a function. | A2.1.3.2.2, A2.2.1.1.4, A2.2.2.1.1, | DecemberJanuary |
| Solve quadratic equations by factoring. | A2.1.3.2.2, A2.2.1.1.4, A2.2.2.1.1, | DecemberJanuary |
| Find the zeros of a quadratic function. | A2.1.3.2.2, A2.2.1.1.4, A2.2.2.1.1, | DecemberJanuary |
| Determine positive or negative intervals. | A2.2.3.1.1, A2.2.3.1.2 | DecemberJanuary  |
| Write the equation of a parabola in factored form. | A2.1.3.2.2, A2.2.1.1.4, A2.2.2.1.1, | DecemberJanuary  |
| Solve a quadratic equation using square roots. | A2.1.1.1.1, A2.1.1.1.2, A2.1.1.2.1, A2.1.3.1.1 | DecemberJanuary |
| Add and subtract complex numbers. | A2.1.1.1.1, A2.1.1.1.2, A2.1.1.2.1, A2.1.3.1.1 | DecemberJanuary |
| Multiply complex numbers. | A2.1.1.1.1, A2.1.1.1.2, A2.1.1.2.1, A2.1.3.1.1 | DecemberJanuary |
| Simplify a quotient with complex numbers | A2.1.1.1.1, A2.1.1.1.2, A2.1.1.2.1, A2.1.3.1.1 | DecemberJanuary |
| Factor a sum of squares. | A2.1.1.1.1, A2.1.1.1.2, A2.1.1.2.1, A2.1.3.1.1 | DecemberJanuary |
| Solve a quadratic equation with complex solutions. | A2.1.1.1.1, A2.1.1.1.2, A2.1.1.2.1, A2.1.3.1.1 | DecemberJanuary |
| Use square roots to solve quadratic equations. | A2.1.3.1.1 | DecemberJanuary  |
| Solve a quadratic equation by Completing the Square. | A2.1.3.1.1 | DecemberJanuary |

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| Complete the Square to solve real world problems. | A2.1.3.1.1 | DecemberJanuary |
| Write a quadratic equation in vertex form. | A2.1.3.1.1 | DecemberJanuary |
| Use the quadratic formula to solve quadratic equations. | A2.1.3.1.1 | DecemberJanuary  |
| Identify the number of real-number solutions. | A2.1.3.1.1 | DecemberJanuary  |
| Interpret the discriminant | A2.1.3.1.1 | DecemberJanuary |
| Use the discriminant to find a particular equation. | A2.1.3.1.1 | DecemberJanuary |
| Classify polynomials | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch |
| Graph polynomial functions. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch  |
| Add, subtract, and multiply polynomials. | A1.1.1.5.1 | FebruaryMarch |
| Use long division to divide polynomials. | A2.1.2.2 | FebruaryMarch  |
| Use synthetic division to divide by x – a. | A2.1.2.2 | FebruaryMarch  |
| Relate P(a) to the Remainder of P(x) ÷ (x – a).  | A2.1.2.2 | FebruaryMarch  |
| Use the Remainder Theorem to evaluate polynomials. | A2.1.2.2 | FebruaryMarch  |
| Check whether x – a is a factor of P(x). | A2.1.2.2 | FebruaryMarch  |
| Use zeros to graph a polynomial functions. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch  |

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| Understand how a multiple of zero can affect a graph. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch  |
| Find real and complex zeros. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch  |
| Solve polynomial equations. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch  |
| Solve a polynomial inequality by graphing. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch  |
| Identify possible rational solutions. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch  |
| Use the Rational Root Theorem. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch  |
| Find all Complex Roots. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch  |
| Write polynomial functions using conjugates. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | FebruaryMarch |
| Write equivalent rational expressions. | A2.1.2.2.2 | MarchApril |
| Simplify a rational expression. | A2.1.2.2.2 | MarchApril |
| Multiply rational expressions. | A2.1.2.2.2 | MarchApril |
| Multiply a rational expression by a polynomial. | A2.1.2.2.2 | MarchApril  |

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| Divide rational expressions. | A2.1.2.2.2 | MarchApril  |
| Add rational expressions with like denominators. | A2.1.2.2.2 | MarchApril  |
| Identify the least common multiple of polynomials. | A2.1.2.2.2 | MarchApril  |
| Add rational expressions with unlike denominators. | A2.1.2.2.2 | MarchApril |
| Subtract rational expressions. | A2.1.2.2.2 | MarchApril  |

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| Find the rate. | A2.1.2.2.2 | MarchApril |
| Simplify a compound fraction. | A2.1.2.2.2 | MarchApril  |
| Solve a rational equation. | A2.1.3.1.2 | MarchApril  |
| Solve a work-rate problem. | A2.1.3.1.2 | MarchApril  |
| Identify an extraneous solution. | A2.1.3.1.2 | MarchApril |
| Solve problems with extraneous solutions. | A2.1.3.1.2 | MarchApril |
| Solve a rate problem. | A2.1.3.1.2 | MarchApril  |
| Find all Real nth roots. | A2.1.2.1.1 | AprilMay |
| Understand rational exponents. | A2.1.2.1.1 | AprilMay  |
| Evaluate expressions with rational exponents. | A2.1.2.1.1 | AprilMay  |
| Simplify nth roots. | A2.1.2.1.1 | AprilMay  |

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| Use nth roots to solve equations. | A2.1.2.1.1 | AprilMay |
| Use nth roots to solve problems. | A2.1.2.1.1 | AprilMay |

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| Use properties of exponents. | A2.1.2.1.1, A2.1.2.1.2, A2.1.2.1.3 S | AprilMay  |
| Use properties of exponents to rewrite radicals. | A2.1.2.1.1, A2.1.2.1.2, A2.1.2.1.3 S | AprilMay  |

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| Rewrite the product or quotient of a radical. | A2.1.2.1.1, A2.1.2.1.2, A2.1.2.1.3 S | AprilMay  |
| Add and subtract radical expressions. | A2.1.2.1.1, A2.1.2.1.2, A2.1.2.1.3 S | AprilMay  |
| Multiply binomial radical expressions. | A2.1.2.1.1, A2.1.2.1.2, A2.1.2.1.3 S | AprilMay |
| Rationalize a binomial denominator. | A2.1.2.1.1, A2.1.2.1.2, A2.1.2.1.3 S | AprilMay  |
| Graph square root and cube root functions. | A2.2.2.1.4 | AprilMay  |
| Solve an equation with one radical | A2.1.3.1.2 | AprilMay  |
| Identify an extraneous solution from a radical equation. | A2.1.3.1.2 | AprilMay  |
| Solve an equation with rational exponents. | A2.1.3.1.2 | AprilMay  |
| Solve an equation with two radicals. | A2.1.3.1.2 | AprilMay  |
| Add and subtract functions. | A2.1.2.1.2, A2.1.2.1.3 | AprilMay  |
| Multiply functions. | A2.1.2.1.2, A2.1.2.1.3 | AprilMay  |
| Divide functions. | A2.1.2.1.2, A2.1.2.1.3 | AprilMay  |
| Compose functions. | A2.1.2.1.2, A2.1.2.1.3 | AprilMay  |

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| Represent the inverse of a relation. | A2.2.1.1.3 | AprilMay  |
| Find an equation of an inverse relation. | A2.2.1.1.3 | AprilMay  |
| Graph an equation and the inverse relation. | A2.2.1.1.3 | AprilMay  |
| Find an equation of an inverse function. | A2.2.1.1.3 | AprilMay  |
| Use composition to verify inverse functions. | A2.2.1.1.3 | AprilMay  |

**ASSESSMENTS**

**PSSA Academic Standards, Assessment Anchors, and Eligible Content:** The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content and incorporate them regularly into planned instruction.

**Formative Assessments:** The teacher will utilize a variety of assessment methods to conduct in-process evaluations of student learning.

**Effective formative assessments for this course include:** Suggested but not limited to: Bell Ringers, Exit Ticket, Cooperative Learning, Observations, Written work, Quizzes, Oral response, Self-evaluation, Homework

**Summative Assessments:** The teacher will utilize a variety of assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.

**Effective summative assessments for this course include:** Suggested but not limited to: Performance Assessment, Tests, and Projects