**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:** Yes No

**WCSD STUDENT DATA SYSTEM INFORMATION**

**Course Level:** Academic

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

F – Final Average MP – Marking Period EXM – Final Exam

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

UGPA-Non-Weighted Grade Point Average  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 | September  October |
| Add and subtract polynomials | A1.1.1.5.1 | September  October |
| Multiply two polynomials. | A1.1.1.5.1 | September  October |
| Factor polynomials | A1.1.1.2.1, A1.1.1.5.2, A1.1.1.5.3 | September  October |
| 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 | September  October |
| Identify a quadratic parent function. | A2.2.2.2.1, A2.2.1.1.1 | October  October |
| Understand the graph of f(x) = ax2. | A2.2.2.2.1, | October  October |
| Interpret quadratic functions from tables. | A2.2.2.2.1 | October  October |
| Apply quadratic functions. | A2.2.2.2.1 | October  October |
| Compare the rate of change. | A2.2.2.2.1 | October  October |
| Understand the graph of g(x) = x2 + k. | A2.2.2.2.1 | October  October |
| Understand the graph of g(x) = (x – h)2. | A2.2.2.2.1 | October  October |
| Understand the graph of a(x – h)2 + k. | A2.2.2.2.1 | October  October |

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

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

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

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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 | February  March |
| 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 | February  March |
| Solve polynomial equations. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | February  March |
| 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 | February  March |
| Identify possible rational solutions. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | February  March |
| 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 | February  March |
| Find all Complex Roots. | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4 | February  March |
| 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 | February  March |
| Write equivalent rational expressions. | A2.1.2.2.2 | March  April |
| Simplify a rational expression. | A2.1.2.2.2 | March  April |
| Multiply rational expressions. | A2.1.2.2.2 | March  April |
| Multiply a rational expression by a polynomial. | A2.1.2.2.2 | March  April |

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

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

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| Use nth roots to solve equations. | A2.1.2.1.1 | April  May |
| Use nth roots to solve problems. | A2.1.2.1.1 | April  May |

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

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

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

**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