**COURSE DESCRIPTION**

**Course Title:** Honors Algebra II

**Course Number:** 00241

**Course Prerequisites:** Honors Algebra I

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| **Course Description:** | Honors Algebra II is the second course in the Honors Mathematics sequence designed for those students able to complete calculus prior to entering college. Changes in our society and technology require a strong background in basic algebra skills. This course expands upon the intense study of algebraic theory that was started in Honors Algebra I and will continue in Honors Geometry and additional advanced math courses. This course provides further use of practical problems to apply the theory and connect algebra to the real world. Honors Algebra II is intended for college-bound students who have an aptitude or interest in mathematics. It provides them with the opportunity to complete an additional year of advanced mathematics. Recommended grade of 75% or higher earned in Honors Algebra I Grade 8 and passed the Algebra I Keystone Exam with a Proficient or Advanced score. A final exam is required. |

**Suggested Grade Level**: Grade 9

**Length of Course:** Two Semesters

**Units of Credit:** 1

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

CSPG #50 Mathematics (7 – 12)

To find the CSPG information, go to <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:** Honors & Dual Enrollment (1) GPA +5%

**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 <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:**  Big Ideas Math Algebra 2

**Publisher:** Big Ideas Learning

**ISBN #:**  978-1-64208-806-9

**Copyright Date:** 2019

**WCSD Board Approval Date:** 8/10/2020

**Supplemental Materials:** kutasoftware.com

**Curriculum Document**

**WCSD Board Approval:**

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

**Date Approved:**  8/10/2020

**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**  |
| Evaluate expressions and formulas | A2.1.2.1, A2.1.1.2, A2.1.2.1.2, A2.1.2.1.3, A2.1.2.2 | September |
| Simplify algebraic expressions | A2.1.2.1.2, A2.1.2.1.3, A2.1.2.2 | September |
| Solve linear equations | A2.1.2.2, A2.1.3.2, A2.1.3.2.2, A2.2.1.1 | September |
| Solve absolute value equations | A2.1.2.1, A2.1.3.2.2  | September |
| Solve inequalities | A2.1.2.1, A2.1.3.2.2  | September |
| Solve absolute value inequalities | A2.1.2.1, A2.1.3.2.2 | September |
| Find domain and range of relations and functions | A2.2.1.1.3 | September |
| Write two-variable linear equations | A2.1.3.1.8, A2.2.2.1.4, A2.2.1.1 | September |
| Solve systems of linear equations using graphing, substitution, and elimination | A2.1.3.1.8, A2.1.3.2.2 | September |
| Simplify expressions using rules of exponents | A2.1.2.1, A2.1.2.1.3, A2.1.2.2 | September |
| Simplify polynomial expressions | A2.1.2.1, A2.1.2.1.2, A2.1.2.1.3, A2.1.2.2 | September |
| Factor polynomial expressions | A2.1.2.1, A2.1.2.2.1 | September |
| Simplify square roots | A2.1.2.1, A2.1.2.1.2 | September |
| Identify and describe transformations of families of functions (linear, absolute value, and quadratic) | A2.2.2.2, A2.2.2.2.1, A2.2.1.1, A2.2.1.1.1, A-REI.10  | October |
| Write functions representing translations, reflections, stretches, shrinks, and combinations of transformations (linear and absolute value) | A2.1.3.1.4, A2.1.3.2, A2.2.1.1, A-CED.2  | October |
| Write linear functions to model real-life problems | A2.1.3.1.4, A2.1.3.2, A2.2.2.1.4, A-CED.2, A-CED.3  | October |
| Find lines of best fit for scatter plots | A2.1.3.1.4, A2.1.3.2, A2.2.1.1, A2.2.1.1.1, A2.2.3.1, A2.2.3.1.2, A-CED.2 | October |
| Use technology to identify and interpret correlation coefficients for scatter plots | A2.2.3.1.1 | October |
| Solve real-world problems using linear programming with systems in two variables | A2.1.3.1.4, A2.1.3.2.1, A-CED.3, A-REI.6 | October |
| Solve systems of linear equations in three variables algebraically | A2.1.3.1.4, A2.1.3.2.2, A-CED.2, A-CED.4, A-CED.1, A-REI.3, A-SSE.2 | October |
| Solve systems of linear equations in three variables using Cramer’s Rule | A2.1.3.1.4  | October |
| Apply systems of linear equations in three variables to real-life problems | A2.1.3.1.4, A2.1.3.2.2, A-CED.2, A-CED.3, A-CED.4, A-CED.1, A-REI.3, A-REI.6, A-SSE.2 | October |
| Identify characteristics of quadratic functions | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4, A-REI.10, A-SSE.1 | November |
| Graph and use quadratic functions in the form f(x) = ax^2 | A2.2.2.1, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4, A2.2.2.2, A2.2.2.2.1, A-REI.10 | November |
| Graph and use quadratic functions in the form f(x) = ax^2 + c | A2.2.2.1, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4, A2.2.2.2, A2.2.2.2.1, A-REI.10 | November |
| Graph and use quadratic functions in the form f(x) = ax^2 + bx + c | A2.2.2.1, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4, A2.2.2.2, A2.2.2.2.1, A-REI.10 | November |
| Find the minimum and maximum values of quadratic functions | A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.3 | November |
| Graph and use quadratic functions in vertex form | A2.2.2.1, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4, A2.2.2.2.1, A-REI.10, A-SSE.1 | November |
| Solve real-life problems involving quadratic functions | A2.2.2.1, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4, A-REI.10, A-SSE.1, A-CED.3 | November |
| Describe transformations of quadratic functions | A2.1.3.1.1, A2.2.1.1.4, A2.2.2.1, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.2, A2.2.2.2.1, A-REI.10, A-SSE.1a, A-SSE.1b | November |
| Write transformations of quadratic functions | A2.1.3.1, A2.1.3.1.1, A2.2.1.1.4, A2.2.2.1, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.2, A-CED.2, A-REI.10, A-SSE.1a, A-SSE.1b | November |
| Graph quadratic functions using intercepts | A2.1.3.1.1, A2.2.1.1.4, A2.2.2.1, A2.2.2.1.1, A2.2.2.1.3, A-REI.10, A-SSE.1, A-SSE.1a, A-SSE.1b | November |
| Write quadratic functions when given the graph, the vertex and a point, or the x-intercepts | A2.1.1.2, A2.1.2.1, A2.1.3.1, A2.1.3.1.1, A2.2.1.1.4, A2.2.2.1, A2.2.2.1.1, A2.2.2.1.3, A2.2.2.1.4, A-CED.2, A-CED.4, A-REI.10, A-SSE.1, A-SSE.2, A-SSE.3, A-SSE.3, A-SSE.1a, A-SSE.1b | November |
| Solve quadratic equations by graphing | A2.1.3.1, A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.8, A-APR.3, A-CED.2, A-CED.4, A-REI.4 | DecemberJanuary |
| Solve quadratic equations using the Square Root Property | A2.1.2.1.2, A2.1.2.2.1, A-REI.4, A-REI.4b, A-SSE.1a | DecemberJanuary |
| Solve quadratic equations using the Zero Product Property | A2.1.2.2.1, A2.1.2.2.1, A-APR.3, A-CED.4, A-REI.3, A-REI.4, A-REI.4b, A-SSE.1a, A-SSE.3a | DecemberJanuary |

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| Solve real-life problems using quadratic equations | A2.1.2.1.2, A2.1.2.2.1, A2.1.2.2.1, A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.8, A-APR.3, A-CED.2, A-CED.3, A-CED.4, A-REI.4, A-REI.4b, A-SSE.1, A-SSE.3a, A-SSE.3b | DecemberJanuary |
| Define and use the imaginary unit i | A2.1.1.1, A2.1.2.1.2 | DecemberJanuary |
| Add, subtract, and multiply complex numbers | A2.1.1.1, A2.1.2.1.2 | DecemberJanuary |
| Divide complex numbers | A2.1.1.1, A2.1.2.1.2 | DecemberJanuary |
| Find complex solutions and zeros using the Square Root Property | A2.1.1.1, A2.1.2.1.2, A2.1.2.2.1, A-REI.4b, A-SSE.1a | DecemberJanuary |
| Solve quadratic equations containing Perfect Square Trinomials using square roots | A2.1.1.1, A2.1.2.1.2, A2.1.2.2.1, A2.1.2.2.1, A-APR.3, A-REI.4, A-REI.4b, A-SSE.1a, A-SSE.3a | DecemberJanuary |
| Solve quadratic equations by completing the square | A2.1.1.1, A2.1.2.1.2, A2.1.2.2.1, A2.1.2.2.1, A-APR.3, A-CED.4, A-REI.3, A-REI.4, A-REI.4a, A-REI.4b, A-SSE.1a, A-SSE.3a, A-SSE.3b | DecemberJanuary |
| Write quadratic functions in vertex form | A2.1.2.2.1, A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.8, A-APR.3, A-CED.2, A-SSE.1, A-SSE.1a | DecemberJanuary |
| Solve quadratic equations using the Quadratic Formula | A2.1.1.1, A2.1.2.1.2, A2.1.2.2.1, A-REI.4, A-REI.4b, A-SSE.1a | DecemberJanuary |
| Analyze the discriminant to determine the number and type of solutions | A2.1.1.1, A2.1.2.1.2, A2.2.1.1.4, A2.2.2.1.1, A-SSE.1a | DecemberJanuary |
| Graph quadratic inequalities in two variables | A2.1.2.2.1, A2.2.1.1.4, A2.2.2.1.8, A-APR.3, A-CED.2, A-SSE.3a | DecemberJanuary |
| Solve quadratic inequalities in one variable by graphing | A2.1.2.2.1, A2.1.2.2.1, A2.2.1.1.4, A2.2.2.1.1, A2.2.2.1.8, A-APR.3, A-CED.2, A-REI.4, A-SSE.3a | DecemberJanuary |
| Solve quadratic inequalities in one variable algebraically | A2.1.2.2.1, A2.1.2.2.1, A-REI.4, A-SSE.3a | DecemberJanuary |
| Identify polynomial functions  | A2.2.1.1.4, A2.2.2.2, A2.2.2.2.1 | JanuaryFebruary |
| Graph polynomial functions using tables and describe their end behavior | A2.2.1.1.4, A2.2.2.1, A2.2.2.1.3, A2.2.2.1.4, A2.2.2.2, A2.2.2.2.1, A-CED.2 | JanuaryFebruary |
| Add, subtract, and multiply polynomials | A2.1.2.1.7, A2.1.2.2, A-APR.1, A-SSE.2, A-SSE.1a | JanuaryFebruary |
| Divide polynomials using long division | A2.1.2.2, A-APR.6, A-SSE.2, A-SSE.1a | JanuaryFebruary |
| Divide polynomials using synthetic division | A2.1.2.2, A-APR.6, A-SSE.2, A-SSE.1a | JanuaryFebruary |
| Use the Remainder Theorem | A2.1.2.2, A-APR.2, A-APR.6 | JanuaryFebruary |
| Factor polynomials completely | A2.1.2.2.1, A-APR.3, A-SSE.2, A-SSE.3, A-SSE.1a, A-SSE.3a | JanuaryFebruary  |
| Use the Factor Theorem | A2.1.2.2.1, A2.1.3.1, A2.2.2.1, A-APR.3, A-APR.6 | JanuaryFebruary  |
| Find solutions of polynomial equations and zeros of polynomial functions | A2.1.1.1.3, A2.1.2.2.1, A2.1.3.1, A2.2.2.1, A2.2.2.1.4, A-APR.3, A-APR.6, A-SSE.2, A-SSE.3, A-SSE.3a | JanuaryFebruary  |
| Use the Rational Root Theorem | A2.1.3.1, A-APR.3, A-SSE.1a | JanuaryFebruary |
| Use the Irrational Conjugates Theorem | A2.1.3.1, A-SSE.1a | JanuaryFebruary |
| Use the Fundamental Theorem of Algebra | A2.1.3.1, A-SSE.3, A-SSE.1a, A-SSE.3a | JanuaryFebruary |
| Use the Complex Conjugates Theorem | A2.1.1.1.3, A2.1.3.1, A-SSE.1a | JanuaryFebruary |
| Use Descartes’ Rule of Signs | A2.1.3.1, A2.2.2.1, A-SSE.1a | JanuaryFebruary |
| Describe and write equations of transformations of polynomial functions | A2.1.2.1.7, A2.1.2.2, A2.1.3.1, A2.2.1.1.4, A2.2.2.1, A2.2.2.1.3, A2.2.2.1.4, A2.2.2.2, A2.2.2.2.1, A-APR.1, A-CED.3, A-SSE.2, A-SSE.3, A-SSE.1a, A-SSE.3a | JanuaryFebruary  |
| Use x-intercepts to graph polynomial functions | A2.1.2.2.1, A2.2.1.1.4, A2.2.2.1, A2.2.2.1.4, A-APR.3, A-CED.2 | JanuaryFebruary  |
| Use the Location Principle to identify zeros of polynomial functions | A2.1.2.2.1, A2.1.3.1, A2.2.1.1.4, A2.2.2.1, A2.2.2.1.3 | JanuaryFebruary  |
| Find the turning points, and identify local maximums and minimums, of graphs of polynomial functions | A2.2.1.1.4, A2.2.2.1, A2.2.2.1.3, A2.2.2.2, A2.2.2.2.1 | JanuaryFebruary  |
| Identify even and odd functions | A2.2.1.1.4, A2.2.2.1, A2.2.2.1.3, A2.2.2.2, A2.2.2.2.1, A-SSE.1a | JanuaryFebruary  |
| Find the nth root of numbers | A2.1.2.1, A2.1.2.1.2, A-SSE.2 | March |
| Evaluate expressions with rational exponents | A2.1.1.2, A2.1.2.1, A2.1.2.1.1, A2.1.2.1.2 | March |
| Solve equations using nth roots | A2.1.1.2, A2.1.2.1, A2.1.3.1, A2.1.3.1.2, A-REI.2 | March |
| Use properties of rational exponents to simplify expressions with rational exponents | A2.1.1.2, A2.1.2.1, A2.1.2.1.1, A2.1.2.1.2, A2.1.2.1.3 | March |
| Use properties of radicals to simplify and write radical expressions in simplest form | A2.1.1.2, A2.1.2.1, A2.1.2.1.2 | March |
| Graph radical functions | A2.2.1.1.3, A2.2.2.1, A2.2.2.1.2, A-SSE.3, A-SSE.3c | March |
| Write transformations of radical functions | A2.1.3.1, A2.2.2.1, A2.2.2.1.2, A-SSE.2, A-SSE.3, A-SSE.3c | March |

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| Solve equations containing radicals and rational exponents | A2.1.1.2, A2.1.2.1, A2.1.2.1.1, A2.1.2.1.2, A2.1.2.1.3, A2.1.3.1, A2.1.3.1.2, A-REI.2, A-SSE.2 | March |
| Solve radical inequalities | A2.1.1.2, A2.1.2.1, A2.1.3.1, A2.1.3.1.2, A-REI.2 | March |
| Add, subtract, multiply, and divide functions | A2.1.1.2, A2.1.2.1, A2.1.2.1.1, A2.1.2.1.3, A2.1.3.1, A-APR.1, A-SSE.2 | March |
| Find and verify inverses of non-linear functions | A2.1.1.2, A2.1.2.1, A2.1.2.1.1, A2.1.3.1, A2.2.1.1.3, A2.2.2.1.2, A-APR.1 | March |
| Solve real-life problems using inverse functions | A2.1.3.1, A2.1.3.1.2, A2.2.1.1.3, A2.2.2.1, A2.2.2.1.2, A-APR.1, A-REI.2 | March |
| Simplify rational expressions | A2.1.2.2, A2.1.2.2.1, A2.1.2.2.2, A-APR.1, A-APR.6, A-APR.7, A-SSE.2, A-SSE.3, A-SSE.1a, A-SSE.1b | April |
| Multiply and divide rational expressions | A2.1.2.2, A2.1.2.2.1, A2.1.2.2.2, A-APR.1, A-APR.6, A-APR.7, A-SSE.2, A-SSE.3, A-SSE.1a, A-SSE.1b | April |
| Add and subtract rational expressions | A2.1.2.2, A2.1.2.2.1, A2.1.2.2.2, A-APR.1, A-APR.6, A-APR.7, A-SSE.2, A-SSE.3, A-SSE.1a, A-SSE.1b | April |
| Simplify complex fractions | A2.1.2.2, A2.1.2.2.1, A2.1.2.2.2, A-APR.1, A-APR.6, A-APR.7, A-SSE.2, A-SSE.3, A-SSE.1a, A-SSE.1b | April |
| Solve rational equations by cross-multiplying | A2.1.2.2, A2.1.2.2.1, A2.1.2.2.2, A2.1.3.1, A2.1.3.1.2, A-APR.1, A-REI.2, A-SSE.2, A-SSE.3, A-SSE.1a, A-SSE.1b | April |
| Solve rational equations by using the least common denominator | A2.1.2.2, A2.1.2.2.1, A2.1.2.2.2, A2.1.3.1, A2.1.3.1.2, A-APR.1, A-REI.2, A-SSE.2, A-SSE.3, A-SSE.1a, A-SSE.1b | April |
| Use sequence notation to write terms of sequences | A2.2.1.1, A2.2.1.1.1, A2.2.1.1.2 | AprilMay |
| Write a rule for the nth term of a sequence | A2.1.3.1, A2.2.1.1, A2.2.1.1.1, A-CED.2 | AprilMay |
| Sum the terms of a sequence to obtain a series and use summation notation | A2.2.1.1 | AprilMay |
| Identify arithmetic sequences | A2.2.1.1, A2.2.1.1.2 | AprilMay |
| Write function rules for arithmetic sequences | A2.1.3.1, A2.2.1.1, A2.2.1.1.1, A-CED.2 | AprilMay |
| Find sums of finite arithmetic sequences | A2.2.1.1 | AprilMay |
| Identify geometric sequences | A2.2.1.1, A2.2.1.1.2 | AprilMay |
| Write function rules for geometric sequences | A2.1.3.1, A2.1.3.1.3, A2.1.3.1.4, A2.2.1.1, A2.2.1.1.1, A-CED.2 | AprilMay |
| Find sums of finite geometric sequences | A2.2.1.1, A-SSE.4 | AprilMay |
| Solve real-life problems involving sequences and series | A2.1.3.1, A2.1.3.1.3, A2.1.3.1.4, A2.2.1.1, A2.2.1.1.1, A2.2.1.1.2, A-CED.2, A-SSE.4 | 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, and 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