Algebra II Syllabus

Teacher – Mrs. Leath Room W23
Chester County High School

Course Description
 Algebra II starts with a continuation of concepts studied in Algebra I. Students will be challenged by new concepts that require graphing skill, function analysis, solving higher order equations, investigating complex number systems, and working with matrices, conic sections, logarithms, data analysis and probability.

Course Rationale
Algebra II is for students who wish to prepare for further mathematics such as Math Analysis/Trigonometry, College Algebra, Discrete Mathematics I and II, AP Statistics, and Calculus. Students who are planning to continue their education after high school should take this course. Students will be involved in communicating information mathematically, solving problems from a real world context and justifying the solutions to problems.

A**. Grading Policy**:

90-100%	A
80-89%	B
70-79%	C
60-79%	D
0-59%	F

B. **Grade may be determined by**:
(1) Alg II Tennessee Standards Assessments & Assignments
(2) Tn Ready Algebra II EOC Test

Assignments will be made daily. Students are expected to complete all assignments, notes, and corrections. When available, extra class time will be used to work on math assignments.

Each assignment should be:
-completed
-neat and well organized
-properly headed (name, period, and date)
-an example of the student's understanding of the assignment by **SHOWING ALL WORK!!!!!**
-cheating is not acceptable and the student's parents/guardians, assistant principal, and counselor will be notified.

C. **Class Materials**: Each student is to bring the following items to class.
- loose leaf paper
- pencil with eraser
- dry erase markers
- highlighters

- notebook*
- graph paper
- calculator (a graphing calculator would be very helpful but not necessary)
- composition notebook

*A binder is recommended for this class. The notebook will be very helpful when reviewing for test, the final exam and future math classes. Students are encouraged to use a one inch three-ring binder.

ATTENDANCE
Attendance in class is VERY important since mathematics is cumulative. When absent from class it is the student's responsibility to obtain assignments, notes, make up tests, etc., to keep up with the rest of the class. Please check google classroom for daily agendas and the make-up work folder for copies of the activities.

APPROVED ACTIVITY ABSENCES – Excused student activities are scheduled in advance, therefore it will be the student's responsibility to turn in assignments and make up tests. A student should inform the teacher before the absence to make the necessary arrangements.

CONDUCT
Students are responsible for their own learning and behavior. Students must not interfere with another student's right to learn.
Students are expected to treat classmates and the teacher with respect at all times. **NO RUDE BEHAVIOR** will be tolerated.
Students are expected to participate. Participation will include such factors as attendance, punctuality to class, student preparation, class notes, cooperative attitude and contribution to the class' learning environment.
Students are expected to begin working promptly on assigned bell work.
Students are expected to stay alert and on task.
Students are expected to use class time to work on MATH when time is given in class.
Cell phone use is by teacher permission only. **This classroom is a no phone zone. All phones will be placed in the phone zone and not be used in class unless the teacher has granted permission. Earbuds are also not allowed unless the teacher grants permission.**

NO FOOD OR DRINKS IN CLASS (Clear water is acceptable).

If a student cannot follow the rules of conduct: Step 1-teacher & student discuss the inappropriate behavior and the student will write a self-referral; Step 2- Teacher will call parent/guardian; Step 3-Teacher will write a referral to send to the assistant principal.

Late or Missing Work
No late work is accepted. Check google classroom for missing work.

Major Instructional Goals
The intent is to explore, investigate and understand the importance of mathematics through real-world experiences. In mathematics, students will acquire the knowledge and skills to problem solve, communicate, reason, create models and make connections. In order to receive credit for this class, students will need to master the following standards. A detailed list of the standards is available at https://www.tn.gov/content/dam/tn/education/standards/math/stds_math.pdf

Algebra II emphasizes polynomial, rational and exponential expressions, equations, and functions. This course also introduces students to the complex number system, basic trigonometric functions, and foundational statistics skills such as interpretation of data and making statistical inferences. Students build upon previous knowledge of equations and inequalities to reason, solve, and represent equations and inequalities numerically and graphically.

The major work of Algebra II is from the following domains and clusters:

The Real Number System
o Extend the properties of exponents to rational exponents.

Seeing Structure in Expressions
o Interpret the structure of expressions.
o Use expressions in equivalent forms to solve problems.

 Arithmetic with Polynomials and Rational Expressions
o Understand the relationship between zeros and factors of polynomials.

Reasoning with Equations and Inequalities
o Understand solving equations as a process of reasoning and explain the reasoning.
o Represent and solve equations graphically.

Interpreting Functions
o Interpret functions that arise in applications in terms of the context.
 Building Functions
o Build a function that models a relationship between two quantities.
 Making Inferences and Justifying Conclusions
o Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

Supporting work is from the following domains and clusters:

Quantities
o Reason quantitatively and use units to solve problems.

The Complex Number System
o Perform arithmetic operations with complex numbers.
o Use complex numbers in quadratic equations.

 Arithmetic with Polynomials and Rational Expressions
o Use polynomial identities to solve problems.
o Rewrite rational expressions.

Creating Equations
o Create equations that describe numbers or relationships.

Reasoning with Equations and Inequalities
o Solve equations and inequalities in one variable.
o Solve systems of equations.

Interpreting Functions
o Analyze functions using different representations.

 Building Functions
o Build new functions from existing functions.

Linear, Quadratic, and Exponential Models
o Construct and compare linear, quadratic, and exponential models and solve problems.
o Interpret expressions for functions in terms of the situation they model.

 Trigonometric Functions
o Extend the domain of trigonometric functions using the unit circle.
o Prove and apply trigonometric identities.

 Interpreting Categorical and Quantitative Data
o Summarize, represent, and interpret data on a single count or measurement variable.
o Summarize, represent, and interpret data on two categorical and quantitative variables.

Conditional Probability and the Rules of Probability
o Understand independence and conditional probability and use them to interpret data.
o Use the rules of probability to compute probabilities of compound events in a uniform probability model.

Algebra II Revised TN Math Standards (2023)

N.RN – The Real Number System A. Extend the properties of exponents to rational exponents.

A2.N.RN.A.1 Extend the properties of integer exponents to rational exponents. a. Develop the meaning of rational exponents by applying the properties of integer exponents. b. Explain why x1/n can be written as the nth root of x. c. Rewrite expressions involving radicals and rational exponents using the properties of exponents.

N.Q- Quantities A. Reason quantitatively and use units to understand problems.

A2.N.Q.A.1 Use units as a way to understand real-world problems. a. Choose and interpret the scale and the origin in graphs and data displays. b. Use appropriate quantities in formulas, converting units as necessary. c. Define and justify appropriate quantities within a context for the purpose of modeling. d. Choose an appropriate level of accuracy when reporting quantities.

N.M – Matrices A. Perform operations on matrices and use matrices in applications.

A2.N.M.A.1 Use matrices to represent data in a real-world context. Interpret rows, columns, and dimensions of matrices in terms of the context.

A2.N.M.A.2 Perform operations on matrices in a real-world context. a. Multiply a matrix by a scalar to produce a new matrix. b. Add and/or subtract matrices by hand and using technology c. Multiply matrices of appropriate dimensions, by hand in simple cases and using technology for more complicated cases. d. Describe the roles that zero matrices and identity matrices play in matrix addition and multiplication, recognizing that they are similar to the roles of 0 and 1 in the real number system.

A2.N.M.A.3 Create and use augmented matrices to solve systems of linear equations in real-world contexts, by hand and using technology.

A.SSE – Seeing Structure in Expressions A. Interpret the structure of expressions.

A2.A.SSE.A.1 Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.

A.APR – Arithmetic with Polynomials and Rational Expressions A. Understand the relationship between zeros and factors of polynomials.

A2.A.APR.A.1 Know and apply the Factor Theorem: For a polynomial p(x) and a number a, p(a) = 0 if and only if (x – a) is a factor of p(x).

A2.A.APR.A.2 Identify zeros of polynomials when suitable factorizations are available and use the zeros to construct a rough graph of the function defined by the polynomial.

A.CED– Creating Equations A. Create equations that describe numbers or relationships.

A2.A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems in a real-world context.

A2.A.CED.A.2 Create equations and inequalities in two variables to represent relationships between quantities and use them to solve problems in a realworld context. Graph equations and inequalities with two variables on coordinate axes with labels and scales, and use the graphs to make predictions.

A2.A.CED.A.3 Rearrange formulas to isolate a quantity of interest using algebraic reasoning.

A.REI – Reasoning with Equations and Inequalities A. Understand solving equations as a process of reasoning and explain the reasoning.

A2.A.REI.A.1 Understand solving equations as a process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method.

A2.A.REI.A.2 Solve radical equations in one variable, and identify extraneous solutions when they exist. B. Solve systems of equations.

A2.A.REI.B.3 Write and solve a system of linear equations in a real-world context.

A2.A.REI.B.4 Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically, graphically, and using technology.

F.IF – Interpreting Functions A. Interpret functions that arise in applications in terms of the context.

A2.F.IF.A.1 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

A2.F.IF.A.2 Calculate and interpret the average rate of change of a function (presented algebraically or as a table) over a specified interval. Estimate and interpret the rate of change from a graph.

A2.F.IF.A.3 Understand geometric formulas as functions. B. Analyze functions using different representations.

A2.F.IF.B.5 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a real-world context. b. Know and use the properties of exponents to interpret expressions for exponential functions in terms of a real-world context.

A2.F.IF.B.6 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions. a. Compare properties of two different functions. Functions may be of different types and/or represented in different ways b. Compare properties of the same function on two different intervals or represented in two different ways.

F.BF – Building Functions A. Build a function that models a relationship between two quantities.

A2.F.BF.A.1 Build a function that describes a relationship between two quantities. a. Combine standard function types using arithmetic operations. b. Combine standard function types using composition.

A2.F.BF.A.2 Define sequences as functions, including recursive definitions, whose domain is a subset of the integers. Write explicit and recursive formulas for arithmetic and geometric sequences in context and connect them to linear and exponential functions B. Build new functions from existing functions.

A2.F.BF.B.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.

A2.F.BF.B.4 Find the inverse of a function. a. Determine whether a function is one-to-one. b. Find the inverse of a function on an appropriate domain. c. Given an invertible function on an appropriate domain, identify the domain of the inverse function.

F.LE– Linear, Quadratic, and Exponential Models A. Construct and compare linear, quadratic, and exponential models and solve problems..

A2.F.LE.A.1 Know the relationship between exponential functions and logarithmic functions. a. Solve exponential equations using a variety of strategies, including logarithms. b. Understand that a logarithm is the solution to $abct = d$, where a, b, c, and d are numbers. c. Evaluate logarithms using technology.

A2.F.LE.A.2 Know that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or cubically.

S.ID – Interpreting Categorical and Quantitative Data A. Summarize, represent, and interpret data on a single count or measurement variable.

A2.S.ID.A.1 Use statistics appropriate to the shape of the data distribution to compare center (mean, median, and/or mode) and spread (range, standard deviation) of two or more different data sets.

A2.S.ID.A.2 Use the mean/standard deviation of a data set to fit it to a normal distribution & to estimate population percentages using the Empirical Rule.

A2.S.ID.A.3 Compute, interpret, and compare z-scores for normally distributed data in a real-world context. B. Summarize, represent, and interpret data on two categorical and quantitative variables.

A2.S.ID.B.4 Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data.

S.IC – Making Inferences and Justifying Conclusions A. Understand solving equations as a process of reasoning and explain the reasoning.

A2.S.IC.A.1 Recognize the purposes of and differences among sample surveys, experiments, and observational studies.

A2.S.IC.A.2 Identify potential sources of bias in statistical studies.

A2.S.IC.A.3 Distinguish between a statistic and a parameter. Evaluate reports based on data and recognize when poor conclusions are drawn from well collected data.

S.CP– Conditional Probability and the Rules of Probability A. Understand independence and conditional probability and use them to create visual representations of data.

A2.S.CP.A.1 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. Categorize events as independent or dependent. B. Understand and apply basic concepts of probability.

A2.S.CP.B.2 Apply statistical counting techniques. a. Use the Fundamental Counting Principle to compute probabilities of compound events and solve problems b. Use permutations and combinations to compute probabilities of compound events and solve problems.

A2.S.CP.B.3 Use the Law of Large Numbers to assess the validity of a statistical claim. C. Use the rules of probability to compute probabilities of compound events in a uniform probability model.

A2.S.CP.C.4 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A and interpret the answer in terms of the given context

A PERSONAL NOTE:
The teacher reserves the right to change this syllabus as needed for academic purposes. Never be afraid to ask questions or to ask for help. If you or your parents wish to conference with me, please contact me to set up a meeting time and place. Do keep an accurate record of all your scores for this class. This will keep you informed as to how well you are doing.
Progress Reports will be handed out every four and a half weeks.
I hope we will have an enjoyable and successful semester in mathematics together. I am looking forward to teaching you and learning with you.

Mrs. Leath
Planning Period – 3rd Period
School Phone Number – 731-989-8125
Email Address – darian.leath@chestercountyschools.org

Class Website- chestercountyschools.org (look under resources for students then staff websites)
        We will also be using Google classroom.

Other useful websites:
State of Tn Website (List of standards, item samplers, and practice test)
Intmath.com (interactive math website)
im.kendallhunt.com (Lessons and Practice)
assistments.org (Practice)
desmos.com (Graphing Calculator)

CARRY OUT THE ASSIGNMENT BELOW
Please review the foregoing pages with a parent or guardian. Sign your name and have a parent or guardian sign also. The signatures indicate your understanding and acceptance of what is said on these pages. Please bring this back signed. A copy will go in your notebook for the class.
Student Signature _____Date _____
Parent/Guardian Signature _____Date _____

Respect ~ Trust ~ Honor