

Advanced Algebra

2019-20 SBL Course Syllabus

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Course Schedule 2 Term block-scheduled course

Required Materials: graphing calculator from the TI-84 (-83) family

Adv Alg Resources (including syllabus, worksheets, answer keys) can be found on Schoology

Advanced Algebra students will be assessed on the Learning Standards listed within this document.

The course's Overall Score is based on the average (mean) value of the individual Learning Standard(s) scores evaluated during each term. Term Overall Scores will be finalized upon the conclusion of each term.

In order to pass (receive credit) the term, students must...

- have an Overall Score of at least (minimum) 2.08
- have no INCOMPLETES (INC) recorded for any of the Learning Standards

As this is a pilot year, Learning Standard(s) and Overall Scores will be initially computed and displayed using PowerSchool. If this method is later deemed inadequate, a link to a Google Spreadsheet with student scores will be provided within PowerSchool.

In most cases...

- Multiple Learning Standard(s) may be assessed at one time.
- The Learning Standard(s) will be assessed using free-response, matching and/or multiple-choice problems.
- Assessments will be very similar, but not necessarily the same, for each student
- The problems can range in value from 0.5 to 4.0 points for a total assessment value of 5.0 points
- For selected questions, students may be given partial value.
- Students may be recognized for **mastering** (perfect 5 out of 5 assessment points) the specific Learning Standard(s) on their **first attempt** (piloted by this class for 2019-20)

Scoring the Learning Standard(s)

3 Met Learning Standard (s)

based on accumulated value of 5 assessment points

at least 4

2.5 minimally Met Learning Standard(s)

at least 3

(being piloted by CHS Math Dept for 2019-20)

2 Approaching Learning Standard(s)

at least 2

1 Attempted Learning Standard(s)

at least ½

Students are given the opportunity to observe, practice, and evaluate (work and answers can be found both online within Schoology or in an answer key in the back of the room) similar problems in and/or outside of class time prior to the Learning Standard(s) assessment. Given the numerous and various types of assessment problems, **failure to score any points on the Learning Standard(s) assessment will be recognized by the instructor as an INCOMPLETE attempt done by the student (written as a "0" for bookkeeping purposes).**

A student that does not take a Learning Standard(s) assessment will receive an INCOMPLETE (INC).

Students will be informed when an alternate process and/or scoring rubric will be used to assess certain Learning Standard(s).

Reassessments

- Students will be given the opportunity to reassess any Learning Standard(s) in which a 3 was not achieved. Each Learning Standard(s) are treated individually even if multiple Learning Standard(s) were assessed at one time.
- Reassessment on the Learning Standard(s) will be allowed after the instructor has determined the individual ready.
- Student readiness will be validated upon successful completion of a number* of problems* (from prior practice sets and/or newly generated). Some problems may* reflect multiple Learning Standard(s) at the same time.
* Instructor's discretion
- Time to demonstrate readiness is subject to **instructor availability** usually before school, during Homeroom, and after school. The instructor will most likely not be available upon the conclusion of the school year.
- Reassessment will occur on a day separate from when the initial assessment was returned.
- For the 2019-20 school year, the highest (maximum) score achieved in the Learning Standard(s) will be used in the calculation of the overall grade.

An **accelerated second reassessment** may be requested by a student if...

- the student at least **Approached** (2 or higher) the Learning Standard(s) on their **first attempt**
AND
- have been regularly recognized for **mastery** (see above) of prior Learning Standard(s)
OR
shown their math skills have been enhanced by earning points in either the Chilton Optimists Math Challenge and/or WI Math League programs

Class Expectations

- Students are engaged in inappropriate conduct when they are not participating in classroom activities and/or disrupting the classroom environment.
- Tardiness is also considered inappropriate conduct. Make-up time for tardies will increase in length as the number of tardies (unexcused) increase. Failure to complete this time within a reasonable manner may result in further disciplinary action.
- Opportunities to participate in class activities may be lost due to excessive inappropriate conduct.
- Students absent/departing for music lessons may do so as long as it does not interfere with any previously scheduled assessments. Students may see if alternate arrangements are available prior to the assessment.
- Students absent/departing due to special school-related activities (possible field trips, athletic events, etc.) are expected to complete any missing assessments as soon as possible.

Classroom strategies

- Concept Checks
- Questions on previous lessons
- Lesson with Guided Practice
- Independent Practice
- Closure

Intervention Strategies

- Having one-on-one discussions with students
- Additional/outside one-on-one/group practice
- Contacting parents by phone, mail, e-mail

The above is a guideline. It can be altered due to circumstances.

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LEARNING STANDARD ASSESSMENTS AND TENTATIVE SCHEDULE

1st or 3rd Term Learning Standards to be met in Advanced Algebra

1: Relations, Compositions, Inverses

- A: Identify the variables, notation, domain, and range of relations of functions
Graph relations and functions and interpret its properties
- B: Add, subtract, multiply and divide functions
Find values, equations and properties of composites of functions
- C: Find values, equations and properties of inverses of relations or function

2: Parent Functions and Transformations

- A: Recognize parent functions and their properties from their equation and graphs
- B: Describe and identify symmetries and asymptotes of graphs
Evaluate floor (rounding down) and ceiling (rounding up) functions
- C: Analyze effect of transformations on functions and graphs, specifically translations
- D: Analyze effect of transformations on functions and graphs, specifically scale changes

3: Linear Equations and Models

- A: Determine slopes given points / parallel lines / perpendicular lines
Identify direct variations & linear equation properties
- B: Write / graph / interpret linear equations in any of the three forms
Find the inverse of a linear equation
- C: Model, analyze, and predict using linear models and analyze correlation coefficients.
- D: Model, analyze, predict and identify properties involving linear regression models

4: Exponent Rules and n th Roots

- A: Simplify expressions involving exponents, radicals and/or imaginary numbers
- B: Perform operations involving exponents, radicals and/or imaginary numbers
- C: Solve Square Root and Other Radical Equations
- D: Find inverse equations involving radicals and basic polynomial equations
Apply transformations to square root & cube root functions.

5: Exponential Models and Logarithms

- A: Recognize exponential functions and its properties in both $y = a \cdot b^x$ and $y = a \cdot e^x$
Model situations using the exponential equation.
- B: Model, analyze, predict and identify properties involving exponential regression models
- C: Write / evaluate logarithmic expressions and graph logarithmic functions
Recognize logarithms as the inverses of exponential models
- D: Solve exponential and logarithmic equations
Apply properties of logarithms to expressions
Rewrite exponential & power functions into their linearized form, and vice versa

2nd or 4th Term Learning Standards to be met in Advanced Algebra

6: Sequences and Series

- A:** Identify types of mathematical sequences and read/write formulas for its n th term
- B:** Find specific terms of arithmetic and geometric sequences
Model situations using arithmetic or geometric sequences
- C:** Find the pattern, terms and explicit formula of polynomial-based (finite differences) sequences
Determine the end behavior of arithmetic, geometric and rational expression sequences
- D:** Read / write / evaluate finite arithmetic or geometric series
Model situations using finite series
- E:** Tell whether an infinite series converges. If it does, give a limit.
Use geometric series in real-world situations.

7: Quadratic Equations and Models

- A:** Factor quadratic equations and solve by factoring
Write quadratic equations, given its roots
- B:** Write quadratic equation in both standard form and vertex form
Identify properties of quadratic functions from various forms and graphs
Solve quadratic equations by graphing (specifically with the calculator) and tables
- C:** Solve quadratic equations by completing the square and/or Quadratic Formula
Determine the number of solutions by using the discriminant
- D:** Model, analyze, predict and identify properties involving quadratic regression models
Determine which model (linear, exponential, quadratic) is most appropriate for data set

8: Polynomials and Rational Functions

- A:** Classify, graph and identify the properties of polynomials
- B:** Review factoring polynomials by chunking and grouping
Divide polynomials by synthetic division and apply the Remainder Theorem
- C:** Use polynomial-related theorems or rules to solve polynomial equations with complex solution
- D:** Identify and compute inverse variations
Identify types of discontinuity, horizontal & vertical asymptotes, and x -intercepts of rational functions
- E:** Simplify rational expressions and complex fractions
- F:** Set up and solve rational equations
- G:** Simplify compositions involving a special group of functions

9: Probability

- A:** Compute probabilities or odds of event(s) given various contexts and conditions
- B:** Apply Fundamental (Multiplication) Counting Principle
Determine if a repeated event has replacement or is without replacement
(and if without, determine if it is permutation or combination based), then count
- C:** Compute terms and identify rows of Pascal's Triangle using pattern recognition and combinations
Expand polynomials by applying the Binomial Theorem
- D:** Compute and use probability distributions
- E:** Design and conduct simulations with or without technology
Use probabilities to make fair decisions and analyze decisions
- F:** Analyze the results of a complex simulation