

# High School Math Courses



**Grades 9 - 12**

Adopted June 7, 2022

# Math Graduation Requirements

The learner must complete a **total of three credits (six semesters) of math courses in high school** to include:

- 1 credit (two semesters) of *Algebra 1* (or one additional math credit if *Algebra 1* was completed in middle school);
- 0.5 credit (one semester) of a statistics course (either *Survey of Math in Society*, *Introduction to Statistics*, semester 2 of *Algebra 2*, or *AP Statistics*); and
- 1.5 credits (three semesters) of additional math options.

High school math credit earned in middle school would not satisfy this math graduation requirement. Instead, it would go towards general elective credit needed to graduate.

Algebra I Options	Statistics Course Options	Additional Math Options
<ul style="list-style-type: none"> <li>• Algebra I</li> <li>• Algebra 1 (Two-Year Program; students must pass 1.2 &amp; 1.3 to fulfill the Algebra 1 graduation requirement.)</li> </ul>	<ul style="list-style-type: none"> <li>• Algebra 2, semester 2</li> <li>• AP Statistics</li> <li>• Introduction to Statistics</li> <li>• Survey of Math in Society</li> </ul>	<ul style="list-style-type: none"> <li>• Accounting 1A/1B</li> <li>• Accounting 2A/2B</li> <li>• Algebra 2 or Honors</li> <li>• Algebra for Finance 1A/1B</li> <li>• AP Calculus AB</li> <li>• AP Calculus BC</li> <li>• AP Computer Science A</li> <li>• AP Computer Science Principles</li> <li>• Computer Programming</li> <li>• Geometry or Honors</li> <li>• Math for the Trades &amp; Technical Careers</li> <li>• Pre-Calculus</li> <li>• Any course listed under Statistics Course Options.</li> <li>• Any Career and Technical Education (CTE) course that is cross-credited with math credit.</li> </ul>

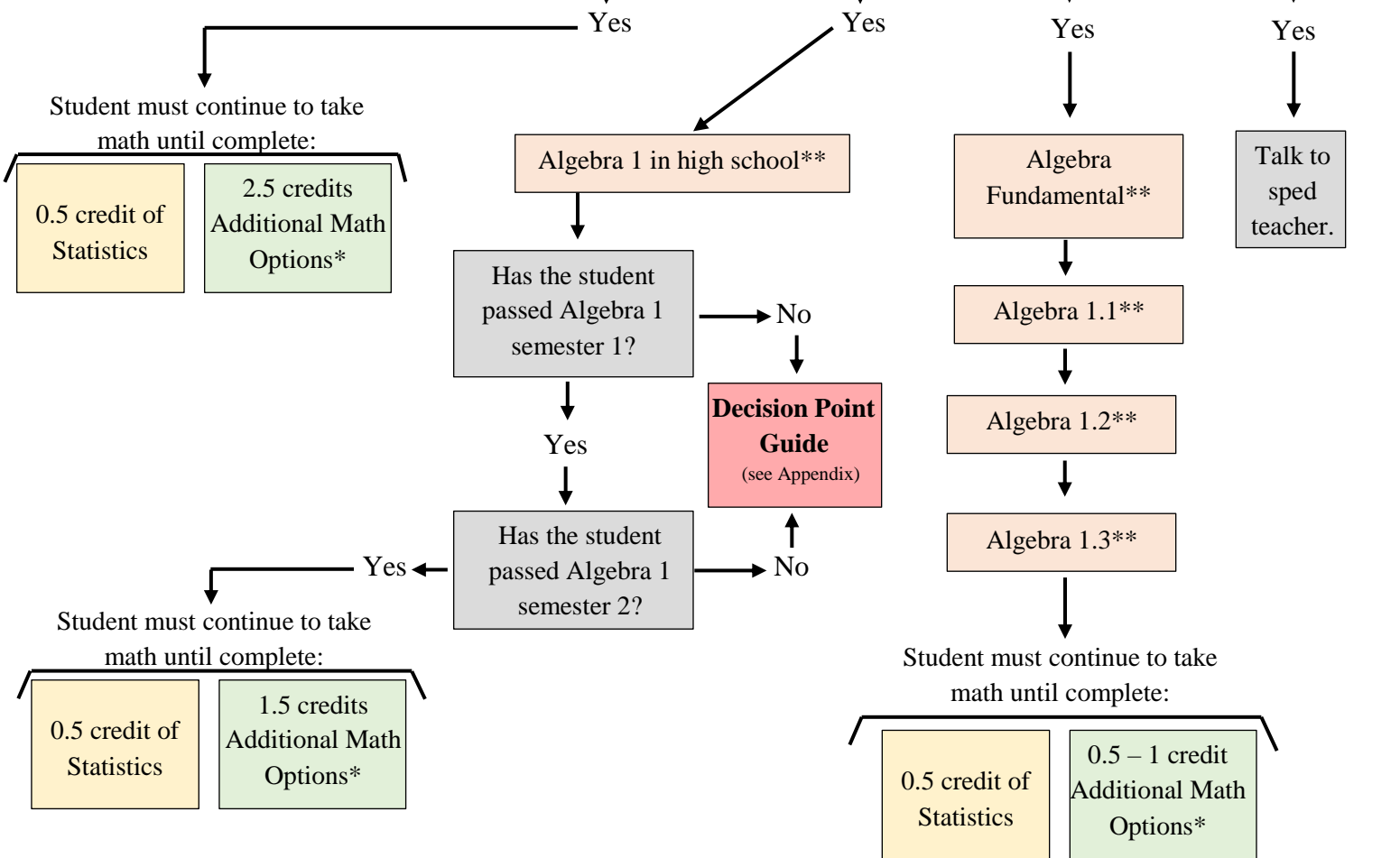
# Recommended High School Pathways

When making decisions about placement, complete the "Decision Point Guide" (see the form in the appendix).

\*Students can be concurrently enrolled in math courses as prerequisites allow.

\*\*If a student is earning a "D" or "F" at the quarter, they should receive Algebra 1 intervention through SSP, Extensions, etc.

Decision Point Guide (see Appendix)			
Has the student passed <i>Algebra 1</i> in middle school with at least a C?	Was Algebra 1 (one-year program) recommended?	Was Algebra 1 (two-year program) recommended?	Does the student have a Math IEP?

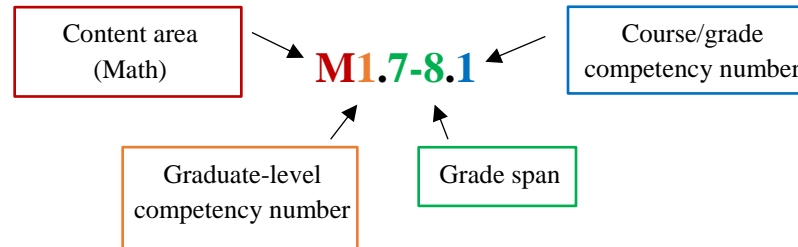


For families of students with an Individualized Education Plan (IEP), there may be additional options available through the Special Education program. Contact the Special Education Department for more information.

Additional Math Options		
<p><b>Statistics Options</b></p> <ul style="list-style-type: none"> <li>Algebra 2, semester 2</li> <li>AP Statistics</li> <li>Intro to Statistics</li> <li>Survey of Math in Society</li> </ul>	<ul style="list-style-type: none"> <li>Accounting 1A/1B &amp; 2A/2B</li> <li>Algebra 2 or Honors</li> <li>Algebra for Finance 1A/1B</li> <li>AP Calculus AB &amp; BC</li> <li>AP Computer Science A</li> <li>AP Computer Science Principles</li> </ul>	<ul style="list-style-type: none"> <li>Computer Programming</li> <li>Geometry or Honors</li> <li>Math for the Trades &amp; Tech Careers</li> <li>Pre-Calculus</li> <li>CTE cross-credited with Math</li> </ul>

# Grades 9-12 Math Competencies

## Competency Coding



## High School Math Competency Checklist

Competencies	Algebra 1	Algebra 1 (Two Year Program)	Algebra 2 & Honors	Algebra for Finance 1A/1B	Accounting 1A	Accounting 1B	Computer Programming	Geometry & Honors	Introduction to Statistics	Accounting 2A/ 2B	Math for the Trades & Tech Careers	Pre-Calculus	Survey of Math in Society
<b>Symbolic Expression:</b> M1: Graduates of the FNSBSD will be able to reason abstractly and utilize symbolic expressions and mathematical models.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
M1.9-12.1: The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
M1.9-12.2: The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓

Competencies	Algebra 1	Algebra 1 (Two Year Program)	Algebra 2 & Honors	Algebra for Finance 1A/1B	Accounting 1A	Accounting 1B	Computer Programming	Geometry & Honors	Introduction to Statistics	Accounting 2A/ 2B	Math for the Trades & Tech Careers	Pre-Calculus	Survey of Math in Society
<b>Numbers and Number Systems:</b> M2: Graduates of the FNSBSD will develop an applied knowledge of numbers and number systems to solve problems.	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
M2.9-12.1: The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
<b>Reasoning and Strategic Thinking:</b> M3: Graduates of the FNSBSD will use evidence to support authentic application of concepts and support mathematical arguments.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
M3.9-12.1: The learner will use computational strategies and algorithms and provide rationale for their use.	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓
M3.9-12.2: The learner will reason quantitatively when analyzing, representing, and solving problems.	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
M3.9-12.3: The learner will compare the effectiveness or logic of two plausible arguments or models.	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓

Competencies	Algebra 1	Algebra 1 (Two Year Program)	Algebra 2 & Honors	Algebra for Finance 1A/1B	Accounting 1A	Accounting 1B	Computer Programming	Geometry & Honors	Introduction to Statistics	Accounting 2A/ 2B	Math for the Trades & Tech Careers	Pre-Calculus	Survey of Math in Society
<b>Measurement:</b> M4: Graduates of the FNSBSD will explain reasoning when applying and modeling geometric principles.			✓	✓				✓			✓	✓	✓
M4.9-12.1: The learner will provide rationale for solving measurement problems that require making conversions among various units and measurement systems, or applying the effect of a scale factor.			✓	✓				✓			✓	✓	✓
<b>Algebraic Functions, Patterns, and Relations:</b> M5: Graduates of the FNSBSD will utilize patterns, relations, and functions to compare, interpret, and analyze situations.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
M5.9-12.1: The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓
M5.9-12.2: The learner will write and apply algebraic modes to represent and answer questions about a given situation.	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
M5.9-12.3: The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Competencies	Algebra 1	Algebra 1 (Two Year Program)	Algebra 2 & Honors	Algebra for Finance 1A/1B	Accounting 1A	Accounting 1B	Computer Programming	Geometry & Honors	Introduction to Statistics	Accounting 2A/ 2B	Math for the Trades & Tech Careers	Pre-Calculus	Survey of Math in Society
M5.9-12.4: The learner will analyze relations and functions, using multiple representations.	✓	✓	✓	✓			✓					✓	✓
M5.9-12.5: The learner will identify, build, and perform operations on relations and functions and justify their reasoning.			✓	✓								✓	✓
<b>Geometry:</b> M6: Graduates of the FNSBSD will solve problems involving spatial reasoning and model geometric concepts in applied contexts.				✓				✓					
M6.9-12.1: The learner will apply geometric theorems and postulates to solve problems, create arguments, and support their reasoning.				✓				✓					
M6.9-12.2: The learner will use geometric theorems and postulates to construct and apply viable arguments.								✓					
M6.9-12.3: The learner will create and use a formal geometric construction, using appropriate tools, to illustrate geometric properties.				✓				✓					

Competencies	Algebra 1	Algebra 1 (Two Year Program)	Algebra 2 & Honors	Algebra for Finance 1A/1B	Accounting 1A	Accounting 1B	Computer Programming	Geometry & Honors	Introduction to Statistics	Accounting 2A/2B	Math for the Trades & Tech Careers	Pre-Calculus	Survey of Math in Society
<b>Data, Analysis, Probability, and Statistics:</b> M7: Graduates of the FNSBSD will apply statistical methods to summarize, represent, analyze, and interpret data.		✓		✓	✓	✓			✓	✓	✓	✓	✓
M7.9-12.1: The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.				✓	✓	✓			✓	✓	✓		✓
M7.9-12.2: The learner will design and implement a plan to collect the appropriate data to answer the statistical question.				✓	✓	✓			✓		✓		✓
M7.9-12.3: The learner will summarize data using appropriate statistics.		✓		✓	✓	✓			✓	✓	✓	✓	✓
M7.9-12.4: The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.		✓		✓	✓	✓			✓	✓	✓	✓	✓
M7.9-12.5: The learner will interpret descriptive statistics and linear models within the context of the data and the original question.		✓		✓		✓			✓		✓		✓
M7.9-12.6: The learner will apply probability concepts to analyze and evaluate potential decisions and strategies.				✓		✓			✓		✓	✓	

# Algebra 1

## Options

# Algebra 1

<p><b>Grade(s):</b> 9-12  <b>Length:</b> two semesters  <b>Credit:</b> 1.0 (0.5 per semester)  <b>Prerequisite:</b> none</p>	<p><b>Overview:</b>  <i>Algebra 1</i> formalizes and extends the mathematics that students learned in middle school. At the heart of <i>Algebra 1</i> is the study of functions. Throughout the study of specific functions (notably linear, exponential, and quadratic functions), students will be able to see the structures of functions, to make generalizations about all functions, and to describe the uniqueness of specific functions. Within the study of functions, students will apply properties of numbers and equality to carry out operations within different functions, all with the goal of seeing the applicability of mathematics to describe and model a wide range of natural or man-made events.</p> <p>If students have not taken and passed this course in middle school, this is the first course in their high school math pathway.</p>
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<b>Mathematical Topics</b> (Recommended Order)	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• Equations and Inequalities</li> <li>• Linear Equations</li> <li>• Relations and Functions</li> <li>• Systems of Equations and Inequalities.</li> </ul>	<ul style="list-style-type: none"> <li>• Exponents and Exponential Functions</li> <li>• Polynomials and Factoring</li> <li>• Quadratic Functions</li> <li>• Solving Quadratic Equations</li> </ul>

Course/ Grade Competencies	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> </ul>

## EQUATIONS & INEQUALITIES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Simplify, then solve equations.</li> <li>• Solve equations with variables on both sides.</li> <li>• Solve any linear equation.</li> <li>• Write and solve equations to model situations.</li> <li>• Solve linear inequalities.</li> <li>• Write and solve inequalities to model situations.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve compound inequalities.</li> <li>• Solve absolute value equations and inequalities.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      N-Q.1, N-Q.2,                      N-Q.3, A-REI.1,                      A-REI.3, A-CED.1,                      A-CED.4</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 1</li> </ul>	

## LINEAR EQUATIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Find and interpret key characteristics (slope, x-intercept, y-intercept) of a linear situation, given a graph, ordered pairs, table, or written description.</li> <li>• Graph a linear equation written in any form.</li> <li>• Model linear situations with equations.</li> <li>• Write a linear equation given information.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Graph and find equations of parallel and perpendicular lines.</li> <li>• Recognize and utilize Point-Slope Form.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      N-Q.1, N-Q.2,                      N-Q.3, F-IF.4,                      F-IF.6, F-IF.7,                      F-IF.9</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 2</li> </ul>	

## RELATIONS & FUNCTIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Determine whether a relation is a function.</li> <li>• Determine the domain and range of a function, given a table of values, ordered pairs, mapping, or graph.</li> <li>• Determine a reasonable domain for a situation described by a linear function.</li> <li>• Sketch and interpret graphs showing key features given a description of a situation and/or function.</li> <li>• Evaluate functions written in function notation.</li> <li>• Interpret statements in function notation in terms of their context.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Use function notation to evaluate functions given a graph.</li> <li>• Compare properties of two functions each expressed in a different way (algebraically, graphically, numerically, in tables, verbal descriptions, etc.).</li> <li>• Write arithmetic sequences both recursively and with an explicit formula.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      N-Q.2, F-IF.1,                      F-IF.2, F-IF.4,                      F-IF.5, F-LE.5,                      F-IF.9, F-BF.1</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 3 (focus on 3-1).</li> </ul>	

## SYSTEMS OF EQUATIONS & INEQUALITIES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve systems of equations by graphing.</li> <li>• Solve systems of equations using substitution.</li> <li>• Solve systems of equations using elimination.</li> <li>• Model situations with linear systems of equations.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Determine solutions to linear inequalities and systems of linear inequalities.</li> <li>• Model situations with inequalities, representing constraints with equations or inequalities and interpreting solutions as viable or non-viable.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-REI.5, A-REI.6,                      A-REI.10, A-REI.11,                      A-REI.12, A-CED.2,                      A-CED.3</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices                      are present in each unit.</p>
<p><b>Suggested Activities,                      Materials, and Resources:</b></p>	<p><i>enVision Algebra 1</i> – topic 4</p>	

## EXPONENTS & EXPONENTIAL FUNCTIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Simplify and evaluate expressions containing integer exponents.</li> <li>• Rewrite expressions involving radicals and rational exponents using the properties of exponents.</li> <li>• Solve equations with rational exponents using the properties of exponents.</li> <li>• Graph simple exponential functions (no vertical or horizontal translations).</li> <li>• Construct simple exponential functions from graphs, tables of values, or a description.</li> <li>• Distinguish between situations that can be modeled with linear functions and with exponential functions.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Write geometric sequences both recursively and with an explicit formula.</li> <li>• Simplify radical expressions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>N-RN.1, N-RN.2,                      F-LE.1, F-LE.2,                      F-LE.5, A-SSE.3,                      F-IF.3, F-IF.8,                      F-IF.9, F-BF.2</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 6</li> </ul>	

## POLYNOMIALS & FACTORING

**Graduate-Level Competency:**

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Interpret the structure of polynomial expressions using language such as terms, factors, and coefficients.</li> <li>• Add, subtract, and multiply polynomials.</li> <li>• Factor polynomials using the greatest common factor.</li> <li>• Factor trinomials.</li> <li>• Factor a difference of squares.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.2,                      A-SSE.3, A-APR.1</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1 – topic 7</i></li> </ul>	

## QUADRATIC FUNCTIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Interpret key features (zeros, maximum/minimum, intercepts) of a parabola in terms of a context.</li> <li>• Graph simple quadratics written in standard form (factorable).</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Graph quadratics in vertex form.</li> <li>• Compare linear, exponential, and quadratic models.</li> </ul>	<p><b><u>AKSS</u></b>                      F-IF.4, F-IF.5,                      F-IF.7, F-IF.8,                      F-IF.9</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 8</li> </ul>	

## SOLVING QUADRATIC EQUATIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve quadratic equations by factoring.</li> <li>• Solve quadratic equations using square roots.</li> <li>• Solve quadratic equations using the quadratic formula.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve quadratic equations by completing the square.</li> <li>• Write solutions as simplified exact values rather than decimal approximations.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-REI.4</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 9</li> </ul>	

# Algebra 1 (Two Year Program)

<p><b>Grade(s):</b> 9-12</p> <p><b>Length:</b> four semesters</p> <p><b>Credit:</b> 2.0 (0.5 per semester)</p> <ul style="list-style-type: none"><li>• 1.0 credit of math elective will be earned for successful completion of Fundamentals and 1.1.</li><li>• 1.0 credit of <i>Algebra 1</i> will be earned for successful completion of 1.2 &amp; 1.3.</li></ul> <p><b>Prerequisite:</b> none</p> <p><b>Placement recommendation:</b> Student scored below the 20<sup>th</sup> percentile on the most recent MAP test and more than one grade level below their current grade level on iReady. Complete the “Decision Point” form.</p>	<p><b>Overview:</b></p> <p><i>Algebra 1</i> formalizes and extends the mathematics that students learned in the middle school. At the heart of <i>Algebra 1</i> is the study of functions. Throughout the study of specific functions (notably linear, exponential, and quadratic functions), students will be able to see the structures of functions, to make generalizations about all functions, and to describe the uniqueness of specific functions. Within the study of functions, students will apply properties of numbers and equality to carry out operations within different functions, all with the goal of seeing the applicability of mathematics to describe and model a wide range of natural or man-made events.</p> <p>The first semester (Fundamentals) of the two-year <i>Algebra 1</i> program provides a review of middle school Algebra math standards, with individualized attention to students’ specific skill deficits. The second semester (1.1) begins instruction in <i>Algebra 1</i>. Over three semesters (1.1, 1.2, and 1.3), students receive the <i>Algebra 1</i> curriculum. Successful completion of the third and fourth semesters (<i>Algebra 1.2</i> and <i>1.3</i>) is required to fulfill the <i>Algebra 1</i> graduation requirement.</p>
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## Expectations of Two Year Program

Expectations of how the two-year *Algebra 1* program will be taught:

- This is a student-centered course that maximizes time for teacher-student interaction. Teachers will focus on student engagement and minimize lecture time.
- This course will help to build mathematical identity and agency for students. Teachers will validate student thinking and encourage positive connections with mathematics.
- Student learning and practice needs to occur in the classroom; assignments completed outside the classroom will have minimal impact on students’ grades.
- Shorter, more frequent targeted assessments will be utilized.
- It is recommended another educator be present in the classroom, as staffing allows, to assist with teacher-student interaction.

<b>Mathematical Topics (Recommended Order)</b>	
<b>Semester 1 (<i>Algebra Fundamentals</i>)</b>	<b>Semester 2 (<i>Algebra 1.1</i>)</b>
<p>Topics covered in this semester can include any from the <i>Math 8</i> curriculum, with the goal of the semester to prepare students for success in the <i>Algebra 1</i> series. Some suggested areas of focus are listed below.</p> <ul style="list-style-type: none"> <li>• Order of Operations and Integer Operations</li> <li>• Solving Equations</li> <li>• Linear Equations</li> </ul>	<ul style="list-style-type: none"> <li>• Equations and Inequalities</li> <li>• Linear Equations</li> <li>• Relations and Functions</li> </ul>
<b>Semester 3 (<i>Algebra 1.2</i>)</b>	<b>Semester 4 (<i>Algebra 1.3</i>)</b>
<ul style="list-style-type: none"> <li>• Systems of Equations and Inequalities</li> <li>• Exponents and Exponential Functions</li> <li>• Statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Polynomials and Factoring</li> <li>• Quadratic Functions</li> <li>• Solving Quadratic Equations</li> </ul>

Course/ Grade Competencies	
Semester 1 ( <i>Algebra Fundamentals</i> )	Semester 2 ( <i>Algebra 1.1</i> )
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> </ul> <p><b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</p>

Course/ Grade Competencies	
Semester 3 (Algebra 1.2)	Semester 4 (Algebra 1.3)
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> <li>• <b>M7.9-12.5:</b> The learner will interpret descriptive statistics and linear models within the context of the data and the original question.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> </ul>

## Semester 1: *Algebra Fundamentals*

### ORDER OF OPERATIONS & INTEGERS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Add, subtract, multiply and divide integer values.</li> <li>• Use order of operations to simplify numerical expressions.</li> <li>• Use order of operations to simplify algebraic expressions.</li> <li>• Model situations with algebraic expressions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      7.NS.2, 7.NS.3,                      7.EE.1, 7.EE.3,                      7.EE.4</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

### SOLVING EQUATIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve one-step equations.</li> <li>• Solve two-step equations.</li> <li>• Simplify and then solve equations with variables on one side.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      8.EE7</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## LINEAR EQUATIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Find and interpret the slope of a linear situation given a graph, ordered pairs, table, or written description.</li> <li>• Use a table of values to graph a linear equation written in slope-intercept form.</li> <li>• Use slope and y-intercept to graph a linear equation written in slope-intercept form.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      8.F.4, 8.F.5</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## Semester 2: Algebra 1.1

### EQUATIONS & INEQUALITIES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Simplify, then solve equations (include literal equations).</li> <li>• Solve equations with variables on both sides.</li> <li>• Write and solve equations to model situations.</li> <li>• Solve linear inequalities.</li> <li>• Write and solve inequalities to model situations.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve compound inequalities.</li> <li>• Solve absolute value equations and inequalities.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      N-Q.1, N-Q.2,                      N-Q.3, A-REI.1,                      A-REI.3, A-CED.1,                      A-CED.4</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b>                      All mathematical practices                      are present in each unit.</p>
<p><b>Suggested Activities,                      Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 1</li> </ul>	

## LINEAR EQUATIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Find and interpret key characteristics (slope, x-intercept, and y-intercept) of a linear situation, given a graph, ordered pairs, table, or written description.</li> <li>• Graph a linear equation written in any form.</li> <li>• Model linear situations with equations.</li> <li>• Write a linear equation given information.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Graph and find equations of parallel and perpendicular lines.</li> <li>• Recognize and utilize Point-Slope Form.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      N-Q.1, N-Q.2,                      N-Q.3, F-IF.4,                      F-IF.6, F-IF.7,                      F-IF.9</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1 – topic 2</i></li> </ul>	

## RELATIONS & FUNCTIONS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Determine whether a relation is a function.</li> <li>• Determine the domain and range of a function, given a table of values, ordered pairs, mapping, or graph.</li> <li>• Determine a reasonable domain for a situation described by a linear function.</li> <li>• Sketch and interpret graphs showing key features given a description of a situation and/or function.</li> <li>• Evaluate functions written in function notation.</li> <li>• Interpret statements in function notation in terms of their context.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Use function notation to evaluate functions given a graph.</li> <li>• Compare properties of two functions each expressed in a different way (algebraically, graphically, numerically, in tables, verbal descriptions, etc.).</li> <li>• Write arithmetic sequences both recursively and with an explicit formula.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      N-Q.2, F-IF.1,                      F-IF.2, F-IF.4,                      F-IF.5, F-LE.5,                      F-IF.9, F-BF.1</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 3 (focus on 3-1)</li> </ul>	

## Semester 3: Algebra 1.2

### SYSTEMS OF EQUATIONS & INEQUALITIES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve systems of equations by graphing.</li> <li>• Solve systems of equations using substitution.</li> <li>• Solve systems of equations using elimination.</li> <li>• Model situations with linear systems of equations.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Determine solutions to linear inequalities and systems of linear inequalities.</li> <li>• Model situations with inequalities, representing constraints with equations or inequalities and interpreting solutions as viable or non-viable.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-REI.5, A-REI.6,                      A-REI.10, A-REI.11,                      A-REI.12, A-CED.2,                      A-CED.3</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 4</li> </ul>	

## EXPONENTS & EXPONENTIAL FUNCTIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Rewrite expressions involving radicals and rational exponents using the properties of exponents.</li> <li>• Solve equations with rational exponents using the properties of exponents.</li> <li>• Graph simple exponential functions (no vertical or horizontal translations).</li> <li>• Construct simple exponential functions from graphs, tables of values, or a description.</li> <li>• Distinguish between situations that can be modeled with linear functions and with exponential functions.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Write geometric sequences both recursively and with an explicit formula.</li> <li>• Simplify radical expressions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>N-RN.1, N-RN.2,                      F-LE.1, F-LE.2,                      F-LE.5, A-SSE.3,                      F-IF.3, F-IF.8,                      F-IF.9, F-BF.2</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 6</li> </ul>	

## STATISTICS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b>  <b>M7.9-12.5</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Represent data on a dot plot, box plot, or histogram.</li> <li>• Use statistics to describe the center and spread of a data set.</li> <li>• Interpret the effect of outliers on a data set.</li> <li>• Represent data on a scatter plot and describe how the two variables are related.</li> <li>• Create linear models from scatter plots (linear regression).</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Use technology to compute and then interpret the correlation coefficient.</li> <li>• Distinguish between correlation and causation.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      S-ID.1, S-ID.2,                      S-ID.3, S-ID.6,                      S-ID.7, S-ID.8,                      S-ID.9</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b>                      All mathematical practices                      are present in each unit.</p>
<p><b>Suggested Activities,                      Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 11</li> </ul>	

## Semester 4: Algebra 1.3

### POLYNOMIALS & FACTORING

**Graduate-Level Competency:**

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Interpret the structure of polynomial expressions using language such as terms, factors, and coefficients.</li> <li>• Add, subtract, and multiply polynomials.</li> <li>• Factor polynomials using the greatest common factor.</li> <li>• Factor trinomials.</li> <li>• Factor a difference of squares.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.2,                      A-SSE.3, A-APR.1</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 7</li> </ul>	

## QUADRATIC FUNCTIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Interpret key features (zeros, maximum/minimum, intercepts) of a parabola in terms of a context.</li> <li>• Graph simple quadratics written in standard form (factorable).</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Graph quadratics in vertex form.</li> <li>• Compare linear, exponential, and quadratic models.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      F-IF.4, F-IF.5,                      F-IF.7, F-IF.8                      F-IF.9  <b><u>Mathematical Practices</u></b>                      All mathematical practices                      are present in each unit.</p>
<p><b>Suggested Activities,                      Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 8</li> </ul>	

## SOLVING QUADRATIC EQUATIONS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve quadratic equations by factoring.</li> <li>• Solve quadratic equations using square roots.</li> <li>• Solve quadratic equations using the quadratic formula.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve quadratic equations by completing the square.</li> <li>• Write solutions as simplified exact values rather than decimal approximations.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-REI.4</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 1</i> – topic 9</li> </ul>	

**Statistics**

**Course Options**

# Advanced Placement Statistics

**Grade(s):** 9-12  
**Length:** two semesters  
**Credit:** 1.0 (0.5 per semester)  
**Prerequisite:** *Algebra 2*

## Overview:

This yearlong course is designed for learners capable of college level work, follows the description put forward by the College Board, and prepares them to take the Advanced Placement exam.

*AP Statistics* introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There are four themes evident in the content, skills, and assessment for this course: exploring data, sampling and experimentation, probability and simulation, and statistical inference. Students use technology, investigations, problem solving, and writing as they build conceptual understanding.

*AP Statistics* is equivalent to a one-semester, introductory, non-calculus-based college course in statistics.

Please visit the College Board-AP Central website for more information (<http://apcentral.collegeboard.com>).

# Algebra 2, Semester 2

**Grade(s):** 9-12  
**Length:** one semester  
**Credit:** 0.5  
**Prerequisite:**  
*Algebra 2, semester 1*

**Overview:**

*Algebra 2* continues students' study of functions including polynomial, exponential, rational, and radical functions. They build and interpret functions that model a relationship between two quantities by analyzing key features of the graphs and equations. Students make sense of periodic behavior as they study trigonometric functions and build fluency with values of sine, cosine, and tangent at various angle measures. Equation solving strategies expand to include higher degree polynomials and quadratics over the complex number system and exponential equations using the properties of logarithms. Transformations are included in all units pertaining to functions. (Concurrent enrollment in geometry is an option.)

***Algebra 2 Honors:***

Students will master all of the topics from *Algebra 2* listed above, with a variety of additional topics to include an in-depth study of asymptotic behaviors associated with radical and rational functions.

**Semester 2 of Algebra 2 fulfills the statistics graduation requirement** (semester one is a prerequisite). Concurrent enrollment in *Geometry* is an option.

The curriculum for this course is under “additional math options.”

# Introduction to Statistics

<b>Grade(s):</b> 9-12 <b>Length:</b> one semester <b>Credit:</b> 0.5 <b>Prerequisite:</b> <i>Algebra I</i> or teacher recommendation	<b>Overview:</b> <i>Introduction to Statistics</i> is a semester-long course that provides an introduction to the topics of statistics and data analysis. Topics include data analysis, probability, simulations, inferential statistics, and techniques of sampling. Students use exploratory methods to identify patterns and make decisions. Emphasis is placed on applications and the use of statistics to solve real-life problems.
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Mathematical Topics (Recommended Order)
<ul style="list-style-type: none"> <li>• Analyzing One-Variable Data</li> <li>• Analyzing Two-Variable Data</li> <li>• Collecting Data</li> <li>• Probability and Distributions</li> </ul>

Course/ Grade Competencies
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.2:</b> The learner will design and implement a plan to collect the appropriate data to answer the statistical question.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> <li>• <b>M7.9-12.5:</b> The learner will interpret descriptive statistics and linear models within the context of the data and the original question.</li> <li>• <b>M7.9-12.6:</b> The learner will apply probability concepts to analyze and evaluate potential decisions and strategies.</li> </ul>

## ANALYZING ONE-VARIABLE DATA

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b>  <b>M7.9-12.5</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• In a data set, identify the individuals and variables (categorical vs. quantitative) and summarize the distribution with a frequency or relative frequency table.</li> <li>• Create bar charts from categorical data, and interpret and compare bar charts and pie charts.</li> <li>• Make, interpret, and compare dot plots of quantitative data.</li> <li>• Make, interpret, and compare stem plots of quantitative data.</li> <li>• Make, interpret, and compare histograms of quantitative data.</li> <li>• Find the mean and median of a distribution of quantitative data, and identify the more appropriate measure of center in a given situation.</li> <li>• Calculate (using technology) and interpret the following measures of spread: range, interquartile range, and standard deviation.</li> <li>• Use the 1.5 x interquartile range rule to identify outliers in a data set.</li> <li>• Make, interpret, and compare boxplots of quantitative data.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Find and interpret a percentile from a distribution of quantitative data.</li> <li>• Find and interpret standardized scores (z-scores).</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      S-ID.1, S-ID.2,                      S-ID.3, S-ID.4</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## ANALYZING TWO-VARIABLE DATA

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.3</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b>  <b>M7.9-12.5</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Display relationships between two categorical variables.</li> <li>• Make a scatter plot of and describe the relationship between two quantitative variables.</li> <li>• Estimate and interpret the correlation between two quantitative variables displayed in a scatterplot.</li> <li>• Distinguish between correlation and causation.</li> <li>• Calculate the correlation between two quantitative variables, apply properties of the correlation, and describe how outliers influence the correlation.</li> <li>• Determine and assess the viability of a linear regression model.</li> <li>• Use regression lines to make predictions.</li> <li>• Interpret the slope and y-intercept of a regression line.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Calculate and interpret residuals.</li> <li>• Use residuals to determine if the relationship between two quantitative variables is best modeled by quadratic or exponential functions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      S-ID.5, S-ID.6,                      S-ID.7, S-ID.8,                      S-ID.9</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>		

## COLLECTING DATA

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M7.9-12.1</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b>  <b>M7.9-12.5</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Identify good statistical questions, and identify the population and sample in a statistical study.</li> <li>• Distinguish between an observational study and an experiment.</li> <li>• Define and describe convenience, voluntary response, and random sampling.</li> <li>• Describe how sampling method affects bias.</li> <li>• Describe how to obtain a simple random sample.</li> <li>• Explain the concepts of sampling variability and how to reduce it.</li> <li>• Use simulations to test a claim about a population proportion.</li> <li>• Find the margin of error for a sample proportion and sample mean using simulation.</li> <li>• Explain how under-coverage, nonresponse, and other aspects of a sample survey can lead to bias.</li> <li>• Explain confounding and the placebo effect.</li> <li>• Explain the purpose of comparison and blinding in an experiment.</li> <li>• Describe how to randomly assign treatments and explain the purpose.</li> <li>• Identify other sources of variability in an experiment.</li> <li>• Outline an experiment that uses a completely randomized design.</li> <li>• Determine if it is appropriate to make an inference about cause and effect.</li> <li>• Evaluate if a study has been carried out ethically.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      S-IC.1, S-IC.2,                      S-IC.3, S-IC.4,                      S-IC.5, S-IC.6</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## PROBABILITY & DISTRIBUTIONS

**Graduate-Level Competency:**

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M7.9-12.5</b>  <b>M7.9-12.6</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Interpret probability as a long-run relative frequency and use simulation to model chance behavior.</li> <li>• Use probability models, the complement rule, and the addition rule for mutually exclusive events to find probabilities.</li> <li>• Use two-way tables and Venn diagrams to find probabilities.</li> <li>• Use two-way tables to find and interpret conditional probabilities.</li> <li>• Use the general multiplication rule to calculate probabilities of independent events.</li> <li>• Compute the number of permutations of <math>n</math> individuals taken <math>r</math> at a time.</li> <li>• Compute the number of combinations of <math>n</math> individuals taken <math>r</math> at a time.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Use the conditional probability formula to calculate probabilities and determine independence.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>S-CP.1, S-CP.2,                      S-CP.3, S-CP.4,                      S-CP.5, S-CP.6,                      S-CP.7, S-CP.8,                      S-CP.9</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

# Survey of Math in Society

<p><b>Grade(s):</b> 9-12  <b>Length:</b> one semester  <b>Credit:</b> 0.5  <b>Prerequisite:</b> <i>Algebra I</i> or teacher recommendation</p>	<p><b>Overview:</b>  <i>Survey of Math in Society</i> serves students by preparing them for the math on which our society operates. Students will learn the vocabulary behind managing their money and how to estimate the hypothetical future values of their accounts, taking risk into account. They will learn the fundamentals of statistics and probability so they can understand how data is summarized and interpreted. Lastly, students will learn to teach computers to calculate and parse using an object-oriented language (Python recommended). This course is intended to be project/activity driven, rather than test-driven.</p>
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<b>Mathematical Topics</b> (Recommended Order)
<ul style="list-style-type: none"> <li>• Basic Finance</li> <li>• Statistics: Summarizing Data</li> <li>• Statistics: Experiments and Probability</li> <li>• Computer Science</li> </ul>

<b>Course/ Grade Competencies</b>
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M4.9-12.1:</b> The learner will provide rationale for solving measurement problems that require making conversions among various units and measurement systems, or applying the effect of a scale factor.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> <li>• <b>M5.9-12.5:</b> The learner will identify, build, and perform operations on relations and functions and justify their reasoning.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.2:</b> The learner will design and implement a plan to collect the appropriate data to answer the statistical question.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> <li>• <b>M7.9-12.5:</b> The learner will interpret descriptive statistics and linear models within the context of the data and the original question.</li> </ul>

## PERSONAL FINANCE (4 weeks)

### Graduate-Level Competency:

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Perform basic calculations with tax tables and incomes.</li> <li>• Compare levels of withholding.</li> <li>• Calculate potential earnings in different account types from banks and credit unions.</li> <li>• Compare different types of securities and mutual funds.</li> <li>• Compare pre- and post-tax accounts.</li> <li>• Evaluate the risks associated with taking on debt and building credit.</li> <li>• Using technology, create an amortization table of a hypothetical home purchase and compare it to renting for the same amount of time.</li> <li>• State the purpose of insurance.</li> <li>• Compare health insurance plans using the following vocabulary: premium, deductible, out-of-pocket maximum, copay, coinsurance.</li> <li>• Calculate cost of different medical situations under different plans.</li> <li>• Compare auto insurance plans using the following vocabulary: premium, liability, uninsured, underinsured, collision, and comprehensive.</li> <li>• Calculate cost of different hypothetical automotive accidents on different insurance packages.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Calculate hypothetical future values of pre- and post-tax accounts</li> <li>• Compare other investing options (such as minerals, real estate, and cryptocurrency), and assess the benefits and drawbacks of each.</li> <li>• Compare banks versus credit unions.</li> <li>• Set financial goals for themselves to plan for retirement.</li> <li>• Compare other forms of insurance: home, life, renters, etc.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p style="text-align: center;">F-BF.1, F-LE.1,                      F-LE.2, F-LE.3,                      F-LE.5, A-CED.1,                      A-CED.2, A-REI.3</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• This unit is first so students can invest hypothetical money in any way they choose and calculate the value of this at the end of the semester.</li> </ul>	

## STATISTICS: SUMMARIZING DATA (5 weeks)

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M4.9-12.1</b>  <b>M7.9-12.1</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b>  <b>M7.9-12.5</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• In a data set, identify the individuals and variables (categorical vs. quantitative), and summarize the distribution with a frequency or relative frequency table.</li> <li>• Create bar charts from categorical data, and interpret and compare bar charts and pie charts.</li> <li>• Make, interpret, and compare dot plots of quantitative data.</li> <li>• Make, interpret, and compare histograms of quantitative data.</li> <li>• Find the mean and median of a distribution of quantitative data, and identify the more appropriate measure of center in a given situation.</li> <li>• Calculate (using technology) and interpret the following measures of spread: range, interquartile range, and standard deviation.</li> <li>• Use the 1.5 x interquartile range rule to identify outliers in a data set.</li> <li>• Make, interpret, and compare boxplots of quantitative data.</li> <li>• Make a scatter plot of and describe the relationship between two quantitative variables.</li> <li>• Make a line of best fit using technology.</li> <li>• Distinguish between correlation and causation.</li> <li>• Use regression lines to make predictions.</li> <li>• Interpret the slope and y-intercept of a regression line.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Find and interpret a percentile from a distribution of quantitative data.</li> <li>• Estimate and interpret the correlation between two quantitative variables displayed in a scatterplot.</li> <li>• Calculate and interpret sample variance.</li> <li>• Make predictions using non-linear models.</li> <li>• Calculate and interpret a z-score from an approximately normal population.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      S-ID.1, S-ID.2,                      S-ID.3, S-ID.6,                      S-ID.7, S-ID.8,                      S-ID.9</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## DATA COLLECTION (4 weeks)

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.3</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Identify good statistical questions, and identify the population and sample in a statistical study.</li> <li>• Distinguish between an observational study and an experiment.</li> <li>• Define and describe convenience, voluntary response, and random sampling.</li> <li>• Describe how sampling method affects bias.</li> <li>• Explain the concepts of sampling variability and how to reduce it.</li> <li>• Describe how to obtain a simple random sample.</li> <li>• Use simulations to test a claim about a population proportion.</li> <li>• Explain how under-coverage, nonresponse, measurement, and other aspects of a sample survey can lead to bias.</li> <li>• Explain confounding and the placebo effect.</li> <li>• Explain the purpose of comparison and blinding in an experiment.</li> <li>• Describe how to randomly assign treatments and explain the purpose.</li> <li>• Identify other sources of variability in an experiment.</li> <li>• Outline an experiment that uses a completely randomized design.</li> <li>• Determine if it is appropriate to make an inference about cause and effect.</li> <li>• Evaluate if a study has been carried out ethically.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Find the margin of error for a sample proportion and sample mean using simulation.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      S-IC.1, S-IC.2,                      S-IC.3, S-IC.4,                      S-IC.5, S-IC.6</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Student propose a research question, create a method for collecting data randomly, and present their findings.</li> </ul>	

## COMPUTER SCIENCE (4 weeks)

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M4.9-12.1</b>  <b>M5.9-12.1</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b>  <b>M5.9-12.5</b>  <b>M7.9-12.1</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Identify a general history of computers, how to recognize their components, the functions of those components, and a basic understanding of how they operate.</li> <li>• Differentiate between an editor and compiler.</li> <li>• Identify and troubleshoot different error types in computer programming: Syntax, Logic, and Semantic.</li> <li>• Learn basic reserved words in the selected language for the class.</li> <li>• Write programs using different data types: string, int, float, Booleans.</li> <li>• Write programs with the following math operators: addition, subtraction, multiplication, division, modulus, and exponentiation.</li> <li>• Write programs that take user input to print a variety of responses.</li> <li>• Write programs with the following string operators: concatenation.</li> <li>• Utilize comments to annotate their programs, create drafts, and debug.</li> <li>• Write programs using the following logical operators: and, or.</li> <li>• Create functions without parameters.</li> <li>• Write programs that contain basic conditional statements.</li> <li>• Write programs and evaluate logic statements that contain the following comparison operators: =, !=, &lt;, &gt;, &lt;=, &gt;=.</li> <li>• Write programs that iterate using “for” and “while” loops.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Create functions with parameters.</li> <li>• Write programs that contain chained/ nested conditional statements.</li> <li>• Write programs with the following math operators: Floor, Ceiling.</li> <li>• Logical Operators: xor and not.</li> <li>• Utilize dictionaries to display information to the user.</li> <li>• Write programs to parse a list/ array and extract specific elements of that list/ array.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      F-IF.2, F-BF.1,                      F-LE.1, F-LE.2,                      F-LE.5, A-CED.1,                      A-CED.2, A-REI.3</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

# **Additional Math Options**

# Accounting 1A/1B

<p><b>Grade(s):</b> 9-12  <b>Length:</b> two semesters  <b>Credit:</b> 1 (0.5 per semester)  <b>Prerequisite:</b> none</p>	<p><b>Overview:</b>  <i>Accounting 1A/1B</i> provides an introduction to the objectives, principles, assumptions, and concepts of financial accounting, which is a specialized branch of accounting that keeps track of a company’s financial transactions. Using standardized guidelines, the transactions are recorded, summarized, and presented in a financial report or financial statement, such as an income statement or balance sheet.</p> <p>This course focuses on procedures and practices from the accounting cycle through financial statement presentation, with an emphasis on recognizing, valuing, reporting, and disclosing assets, liabilities, and equity. Students will acquire the capability for developing a sound financial basis for accounting. This course presumes no previous accounting knowledge.</p>
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<b>Mathematical Topics</b> (Recommended Order)	
<b>Semester 1</b> <i>(Accounting 1A)</i>	<b>Semester 2</b> <i>(Accounting 1B)</i>
<ul style="list-style-type: none"> <li>• Starting a Proprietorship: Changes that Affect the Accounting Equation</li> <li>• Analyzing Transactions into Debit and Credit Parts</li> <li>• Journalizing Transactions</li> <li>• Posting to a General Ledger</li> <li>• Cash Control Systems</li> <li>• Work Sheet and Adjusting Entries for a Service Business</li> <li>• Financial Statements for Proprietorship</li> <li>• Recording Closing Entries and Preparing a Post-Closing Trial Balance for A Service Business</li> </ul>	<ul style="list-style-type: none"> <li>• Accounting for Purchases and Cash Payments</li> <li>• Accounting for Sales and Cash Receipts</li> <li>• Accounting for Transactions Using a General Journal</li> <li>• Preparing Payroll Records</li> <li>• Accounting for Payroll and Payroll Taxes</li> <li>• Accounting for Uncollectible Accounts Receivable</li> <li>• Preparing Adjusting Entries and a Trial Balance</li> <li>• Financial Statements and Closing Entries for a Corporation</li> <li>• Financial Statement Analysis</li> </ul>

## Course/ Grade Competencies

Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.2:</b> The learner will design and implement a plan to collect the appropriate data to answer the statistical question.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.2:</b> The learner will design and implement a plan to collect the appropriate data to answer the statistical question.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> <li>• <b>M7.9-12.6:</b> The learner will apply probability concepts to analyze and evaluate potential decisions and strategies.</li> </ul>

## STARTING A PROPRIETORSHIP: CHANGES THAT AFFECT THE ACCOUNTING EQUATION

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M7.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Understand accounting standards and rules.</li> <li>• Use basic accounting equations.</li> <li>• Determine the effects of business transactions.</li> <li>• Learn about receiving cash.</li> <li>• Learn about paying cash.</li> <li>• Learn about purchasing on account.</li> <li>• Learn about paying on account.</li> <li>• Learn about receiving cash from sales.</li> <li>• Learn about sales on account.</li> <li>• Learn about receiving cash on account.</li> <li>• Learn about paying cash to the owner for personal use.</li> <li>• Understand the summary of changes in owner’s equity.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Practice oral communication.</li> <li>• Practice written communication.</li> <li>• Learn about the role of accounting.</li> <li>• Understand ethics in business.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: TerraCycle</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 1-1, 1-2, and 1-3</li> <li>○ Application problems 1-1, 1-2, and 1-3</li> </ul> </li> <li>• Analyzing Nike’s financial statements</li> </ul>	

## ANALYZING TRANSACTIONS INTO DEBIT & CREDIT PARTS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Use T accounts.</li> <li>• Analyze how transactions affect accounts.</li> <li>• Analyze how transactions affect the owner’s equity accounts.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: SportClips</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 2-1, 2-2, and 2-3</li> <li>○ Application problems 2-1, 2-2, and 2-3</li> </ul> </li> <li>• Auditing for errors</li> </ul>	

## JOURNALIZING TRANSACTIONS

**Graduate-Level Competency:**

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b> <b>M7.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Understand double-entry accounting.</li> <li>• Learn about source documents.</li> <li>• Prepare journal entries.</li> <li>• Learn about receipts.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about chronological records.</li> <li>• Practicing using calculator tapes.</li> <li>• Start a new General Journal page.</li> <li>• Correct errors in journal entries.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Target</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 3-1, 3-2, 3-3, and 3-4</li> <li>○ Application problems 3-1, 3-2, 3-3, and 3-4</li> </ul> </li> <li>• 21<sup>st</sup> Century Skills</li> </ul>	

## POSTING TO A GENERAL LEDGER

**Graduate-Level Competency:**

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

Course/ Grade Competency	Content Objectives	Standards
<b>M3.9-12.2</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Prepare a chart of accounts.</li> <li>• Post from a General Journal to a General Ledger.</li> <li>• Prove cash</li> <li>• Create a journal entry to record a correcting entry.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Create a memorandum for correcting entries.</li> <li>• Assign account numbers.</li> <li>• Open an account in a General Ledger.</li> <li>• Understand the relationship of a T account to an Account Form.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Tidal</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 4-1, 4-2, and 4-3</li> <li>○ Application problems 4-1, 4-2, and 4-3</li> <li>○ Source documents problem 4-S</li> </ul> </li> <li>• Auditing for errors</li> </ul>	

## CASH CONTROL SYSTEMS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

Course/ Grade Competency	Content Objectives	Standards
<b>M1.9-12.1</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Practice bank statement reconciliation.</li> <li>• Complete check stubs and checks.</li> <li>• Understand and interpret bank statements.</li> <li>• Deposit cash.</li> <li>• Learn about petty cash.</li> <li>• Establish a petty cash fund.</li> <li>• Replenish petty cash.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• How businesses use cash.</li> <li>• Learn about restrictive endorsement.</li> <li>• Learn about special endorsement.</li> <li>• Learn about blank endorsement.</li> <li>• Record a voided check.</li> <li>• Practice oral communication of accounting information.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Starbucks</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 5-1, 5-2, 5-3, and 5-4</li> <li>○ Application problem 5-1, 5-2, 5-3, and 5-4</li> <li>○ Reinforcement activity 1, part A</li> </ul> </li> </ul>	

## WORK SHEET & ADJUSTING ENTRIES FOR A SERVICE BUSINESS

**Graduate-Level Competency:**

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M5.9-12.3</b> <b>M7.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Create a work sheet.</li> <li>• Prepare a trial balance on a work sheet.</li> <li>• Plan adjustments on a work sheet.</li> <li>• Record net income.</li> <li>• Calculate and record a net loss.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Prove the adjustments column of a work sheet.</li> <li>• Partial ledger accounts after posting adjusting entries.</li> <li>• Prevent errors.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: AICPA</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 6-1, 6-2, 6-3, and 6-4</li> <li>○ Application problems 6-1, 6-2, 6-3, and 6-4</li> </ul> </li> <li>• Analyzing Nike’s financial statements</li> </ul>	

## FINANCIAL STATEMENTS FOR A PROPRIETORSHIP

**Graduate-Level Competency:**

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Prepare an income statement.</li> <li>• Report financial information.</li> <li>• Analyze an income statement.</li> <li>• Calculate net income ratio.</li> <li>• Calculate total expense ratio.</li> <li>• Learn about acceptable financial ratios.</li> <li>• Prepare a statement of owner’s equity.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Prepare the heading of an income statement.</li> <li>• Prepare the heading of a balance sheet.</li> <li>• Prepare the body of a statement of owner’s equity.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Winmark Corporation</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working papers 7-1 and 7-2</li> <li>○ Application problems 7-1 and 7-2</li> </ul> </li> </ul>	

## RECORDING CLOSING ENTRIES & PREPARING A POST-CLOSING TRIAL BALANCE FOR A SERVICE BUSINESS

**Graduate-Level Competency:**

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M7.9-12.1</b> <b>M7.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Record closing entries.</li> <li>• Prepare a post-closing trial balance.</li> <li>• Make a closing entry to record net income or loss.</li> <li>• Make a closing entry for the owner’s drawing accounting.</li> <li>• Make a closing entry for an income statement account.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about the accounting cycle for a service business.</li> <li>• Prepare a post-closing trial balance.</li> <li>• Learn about the need for the income summary account.</li> <li>• Learn about the need for closing temporary accounts.</li> <li>• Learn about the need for permanent and temporary accounts.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Radio Flyer</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 8-1 and 8-2</li> <li>○ Application problems 8-1 and 8-2</li> <li>○ Reinforcement activity 1, part B</li> </ul> </li> </ul>	

## ACCOUNTING FOR PURCHASES & CASH PAYMENTS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Prepare subsidiary ledgers.</li> <li>• Learn about controlling accounts.</li> <li>• Learn about how to form a corporation.</li> <li>• Practice the perpetual inventory method.</li> <li>• Practice the periodic inventory method.</li> <li>• Learn about the cost of goods sold.</li> <li>• Prepare purchases journal.</li> <li>• Prepare cash payments journal.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Prove the accounts payable ledger.</li> <li>• Total, prove, and rule a cash payments journal.</li> <li>• Total and rule a purchases journal.</li> <li>• Replenish a petty cash fund.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Staples</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working papers 9-1, 9-2, 9-3, 9-4, and 9-5</li> <li>○ Application problem 9-1, 9-2, 9-3, 9-4, and 9-5</li> <li>○ Using source document 9-S</li> </ul> </li> </ul>	

## ACCOUNTING FOR SALES & CASH RECEIPTS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b>  <b>M7.9-12.6</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about sales tax.</li> <li>• Prepare a sales invoice.</li> <li>• Process sales transactions.</li> <li>• Process cash and credit card sales.</li> <li>• Process credit cards.</li> <li>• Process sales transactions.</li> <li>• Prove cash at the end of a month.</li> <li>• Calculate cash receipts on an account with a sales discount.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Prove the Accounts Receivable Ledger.</li> <li>• Total, prove, and rule a Cash Receipts Journal.</li> <li>• Total, prove, and rule Sales Journal.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Federal Trade Commission</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working papers 10-1, 10-2, 10-3, and 10-4</li> <li>○ Application problems 10-1, 10-2, 10-3, and 10-4</li> <li>○ Using source document 10-S</li> </ul> </li> </ul>	

## ACCOUNTING FOR TRANSACTIONS USING A GENERAL JOURNAL

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M7.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Journalize sales returns and allowances.</li> <li>• Learn about accounting for the declaration and payment of a dividend.</li> <li>• Journalize purchase returns and allowances.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Declare a dividend.</li> <li>• Pay declared dividends.</li> <li>• Prepare memorandum for buying supplies on account.</li> <li>• Correct errors in subsidiary ledger accounts.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p style="text-align: center;">A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Square, Inc.</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 11-1, 11-2, and 11-3</li> <li>○ Application problems 11-1, 11-2, and 11-3</li> </ul> </li> <li>• Auditing for errors</li> </ul>	

## PREPARING PAYROLL RECORDS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M3.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Calculate employee earning.</li> <li>• Determine payroll tax withholding.</li> <li>• Prepare payroll records.</li> <li>• Prepare payroll checks.</li> <li>• Understand and interpret a payroll bank statement.</li> <li>• Learn about payroll taxes.</li> <li>• Calculate employee hours worked.</li> <li>• Prepare employee earning records.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Prepare electronic funds transfer.</li> <li>• Learn about voluntary deductions from earnings.</li> <li>• Learn about time clock systems.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Deloitte University</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 12-1, 12-2, 12-3, and 12-4</li> <li>○ Application problems 12-1, 12-2, 12-3, and 12-4</li> <li>○ Source document 12-S</li> </ul> </li> </ul>	

## ACCOUNTING FOR PAYROLL & PAYROLL TAXES

### Graduate-Level Competency:

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b>  <b>M3.9-12.2</b>  <b>M7.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Record payroll.</li> <li>• Analyze payment of payroll.</li> <li>• Record employer payroll taxes.</li> <li>• Learn about employer payroll taxes.</li> <li>• Learn about state unemployment tax.</li> <li>• Learn about Federal unemployment tax.</li> <li>• Learn about employer Social Security and Medicare taxes.</li> <li>• Calculate unemployment taxes.</li> <li>• Prepare employer’s quarterly federal tax return.</li> <li>• Prepare employer’s annual reporting of payroll taxes.</li> <li>• Learn how to make Federal tax deposits.</li> <li>• Learn about paying the Liability for Federal Unemployment Tax.</li> <li>• Learn about paying the Liability for Employee Income Tax, Social Security Tax, and Medicare Tax.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Prepare different forms containing payroll information.</li> <li>• Journalize payment of a payroll.</li> <li>• Journalize employer payroll taxes.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.                      CC.9-12.A.REI.1                      CC.9-12.A.REI.1                      CC.9-12.A.CED.1                      CC.9-12.A.CED.1</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: GoPro</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working papers 13-1, 13-2, 13-3, and 13-4</li> <li>○ Application problems 13-1, 13-2, 13-3, and 13-4</li> <li>○ Reinforcement activity 2, part A</li> </ul> </li> </ul>	

## ACCOUNTING FOR UNCOLLECTIBLE ACCOUNTS RECEIVABLE

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

Course/ Grade Competency	Content Objectives	Standards
<b>M1.9-12.1</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about methods of estimating uncollectable accounts receivable.</li> <li>• Adjust entry for allowance for uncollectible accounts.</li> <li>• Estimate uncollectible accounts expense.</li> <li>• Reopen an account previously written off.</li> <li>• Prepare promissory notes.</li> <li>• Learn about maturity dates of promissory notes.</li> <li>• Calculate interest on promissory notes.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Journalize the writing-off of an uncollectible accounts receivable.</li> <li>• Accept a note receivable from a customer.</li> <li>• Understand promissory notes.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):</li> <li>• Accounting in the real world: United Parcel Service               <ul style="list-style-type: none"> <li>○ Working papers 14-1, 14-2, and 14-3</li> <li>○ Application problems 14-1, 14-2, and 14-3</li> </ul> </li> </ul>	

## PREPARING ADJUSTING ENTRIES & A TRIAL BALANCE

**Graduate-Level Competency:**

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M5.9-12.3</b> <b>M7.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Calculate Federal income tax.</li> <li>• Calculate the depreciation of plan assets.</li> <li>• Plan adjusting entries.</li> <li>• Adjust merchandise inventory and interest receivables.</li> <li>• Adjust accumulated depreciation.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Journalize the adjusting entry for Federal income tax payable.</li> <li>• Journalize the adjusting entry for accumulated depreciation.</li> <li>• Journalize the adjusting entry for interest receivable.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Dollar General</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 15-1, 15-2, 15-3, and 15-4</li> <li>○ Application problems 15-1, 15-2, 15.3 and 15.4</li> </ul> </li> <li>• Auditing for errors</li> </ul>	

## FINANCIAL STATEMENTS & CLOSING ENTRIES FOR A CORPORATION

### Graduate-Level Competency:

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M3.9-12.2</b> <b>M3.9-12.3</b> <b>M7.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Prepare an income statement.</li> <li>• Prepare a statement of stockholder’s equity.</li> <li>• Prepare a balance sheet.</li> <li>• Record closing entries for income statement accounts.</li> <li>• Prepare a post-closing trial balance.</li> <li>• Complete closing entries for a corporation recorded in a journal.</li> <li>• Understand supporting schedules for a balance sheet.</li> <li>• Prepare closing entries for dividends.</li> <li>• Prepare closing entries to record net income.</li> <li>• Prepare closing entries for accounts with credit balances.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Prepare post-closing trial balance.</li> <li>• Complete a balance sheet.</li> <li>• Learn about the income summary account.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p style="text-align: center;">A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Toshiba</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 16-1, 16-2, 16-3, 16-4, and 16-5</li> <li>○ Application problems 16-1, 16-2, 16-3, 16-4, and 16-5</li> </ul> </li> </ul>	

## FINANCIAL STATEMENT ANALYSIS

**Graduate-Level Competency:**

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M7.9-12.1</b> <b>M7.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Calculate vertical analysis ratios.</li> <li>• Use vertical analysis ratios to analyze gross profit.</li> <li>• Understand the vertical analysis of a balance sheet.</li> <li>• Calculate the horizontal analysis.</li> <li>• Analyze financial statements using financial ratios.</li> <li>• Calculate liquidity ratios.</li> <li>• Calculate market ratios.</li> <li>• Calculate earnings per share.</li> <li>• Correct an unfavorable debt ratio.</li> <li>• Correct an unfavorable operating expense ratio.</li> <li>• Correct an unfavorable gross margin.</li> <li>• Manage an unfavorable gross margin.</li> <li>• Calculate vertical analysis ratios on a balance sheet.</li> <li>• Calculate price-earnings ratio.</li> <li>• Learn about dividend yields.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Analyze trends with vertical analysis.</li> <li>• Learn about quick ratios.</li> <li>• Learn about the current ratio.</li> <li>• Learn about working capital.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Scottrade</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 17-1, 17-2, 17-3, and 17-4</li> <li>○ Application problems 17-1, 17-2, 17-3, and 17-4</li> <li>○ Reinforcement activity 2, part B</li> </ul> </li> <li>• Analyzing Nike’s financial statements</li> </ul>	

# Accounting 2A/2B

<p><b>Grade(s):</b> 10-12  <b>Length:</b> two semesters  <b>Credit:</b> 1 (0.5 per semester)  <b>Prerequisite:</b> <i>Accounting 1A/1B</i> or teacher recommendation</p>	<p><b>Overview:</b>  <i>Accounting 2A/2B</i> introduces students to the concepts and applications of managerial accounting. Students focus on analysis and recording of various manufacturing costs, cost-volume-profit analysis, preparation of financial statements for a manufacturer, creation of static and flexible budgets and reports, evaluation of capital investments, and various costing systems.</p>
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Mathematical Topics (Recommended Order)	
Semester 1 <i>(Managerial Accounting 2A)</i>	Semester 2 <i>(Managerial Accounting 2B)</i>
<ul style="list-style-type: none"> <li>• Acquiring Capital for Growth and Development</li> <li>• Accounting for Plant Assets, Depreciation, and Intangible Assets</li> <li>• Accounting for Inventory</li> <li>• Accounting for Accruals, Deferrals, and Reversing Entries</li> <li>• End-of-Fiscal-Period Work for a Corporation</li> </ul>	<ul style="list-style-type: none"> <li>• Forming a Partnership</li> <li>• Distribution of Net Income and Owner’s Equity Statements</li> <li>• Dissolving a Partnership</li> <li>• Recording International Sales</li> <li>• Recording Internet Sales</li> </ul>

Course/ Grade Competencies	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.2:</b> The learner will design and implement a plan to collect the appropriate data to answer the statistical question.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> </ul>

## ACQUIRING CAPITAL FOR GROWTH & DEVELOPMENT

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M7.9-12.1</b></p>	<p><b>Short-Term Debt Financing:</b>  <u>Must be Covered:</u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Short-Term Debt Financing</li> <li>• Long-Term Debt Financing</li> <li>• Capital Stock</li> <li>• Acquiring Additional Stock</li> </ul> <p><u>Can be Covered:</u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Signing a Promissory Note for an Extension of Time</li> <li>• Selecting Financing Methods</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      CC.9-12.A.REI.1                      CC.9-12.A.REI.1                      CC.9-12.A.CED.1                      CC.9-12.A.CED.1                      CC.9-12.A.CED.1</p>
	<p><b>Long-Term Debt Financing:</b>  <u>Must be Covered:</u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Applying for a Business Loan</li> <li>• Issuing Bonds</li> <li>• Paying Interest on Bonds</li> </ul> <p><u>Can be Covered:</u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Signing a Long-Term Note Payable</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      CC.9-12.N.Q.1</p>
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b></p>	<p><b>Capital Stock:</b>  <u>Must be Covered:</u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Issuing Capital Stock</li> <li>• Issuing Stock in Excess of Par Value</li> <li>• Issuing Preferred Stock at Par Value</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      CC.9-12.A.REI.1</p>

## ACQUIRING CAPITAL FOR GROWTH & DEVELOPMENT (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b>  <b>M7.9-12.3</b></p>	<p><b>Acquiring Additional Capital:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Making Financial Decisions</li> <li>• Financial Leverage</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Selecting Financial Methods</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      All mathematical practices                      are present in each unit.</p>
<p><b>Suggested Activities,                      Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Ford Motor Company</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working papers 18-1, 18-2, 18-3, and 18-4</li> <li>○ Application problems 18-1, 18-2, 18-3, and 18-4</li> </ul> </li> <li>• 21<sup>st</sup> Century Skills: Financial, Economic, Business, and Entrepreneurial Literacy</li> </ul>	

## ACCOUNTING FOR PLANT ASSETS, DEPRECIATION, & INTANGIBLE ASSETS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M7.9-12.1</b>  <b>M7.9-12.4</b></p>	<p><b>Buying Plant Assets &amp; Paying Property Taxes:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Plant Assets</li> <li>• Recording the Buying of a Plant Asset</li> <li>• Calculating and Paying Property Tax</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Recording the Buying of a group of Assets</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>
<p><b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b></p>	<p><b>Calculating Depreciation Expense:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Calculating Straight-Line Depreciation</li> <li>• Calculating Accumulated Depreciation</li> <li>• Calculating Book Value</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Calculating depreciation expense for part of a year.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b>Journalizing Depreciation Expense:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Preparing Plant Asset Records</li> <li>• Journalizing Annual Depreciation Expense</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>

## ACCOUNTING FOR PLANT ASSETS, DEPRECIATION, & INTANGIBLE ASSETS (continued)

Course/ Grade Competency	Content Objectives	Standards
<p>M2.9-12.1 M3.9-12.3 M5.9-12.2 M7.9-12.1</p>	<p><b>Disposing of Plant Assets:</b> <b><u>Must be Covered:</u></b> The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Selling a Plant Asset for Book Value</li> <li>• Recording Depreciation Expense on Disposal of an Asset</li> <li>• Selling a Plant Asset for more than Book Value</li> <li>• Selling a Plant Asset for less than Book Value</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p>M1.9-12.1 M2.9-12.1 M3.9-12.3 M5.9-12.2 M7.9-12.1</p>	<p><b>Declining-Balance Method of Appreciation:</b> <b><u>Must be Covered:</u></b> The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Calculating Depreciation Using the Double-Declining-Balance Method</li> <li>• Calculating Depreciation Expense in the Final Year</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Accelerated Depreciation Methods</li> <li>• Comparing Two Methods of Depreciation</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Buying Intangible Assets &amp; Calculating Amortization Expense:</b> <b><u>Must be Covered:</u></b></p>	<p>The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Recording the Buying of an Intangible Asset</li> <li>• Calculating and Recording Amortization Expense</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.3. A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Costco Wholesale</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):             <ul style="list-style-type: none"> <li>○ Working papers 19-1, 19-2, 19-3, 19-4, 19-5, and 19-6</li> <li>○ Application problems 19-1, 19-2, 19-3, 19-4, and 19-6</li> </ul> </li> <li>• 21<sup>st</sup> Century Skills: Financial, Economic, Business, and Entrepreneurial Literacy</li> </ul>	

## ACCOUNTING FOR INVENTORY

### Graduate-Level Competency:

- M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.
- M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.
- M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.
- M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.
- M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b>  <b>M7.9-12.3</b></p>	<p><b>Determining the Quantity of Merchandise Inventory:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• The Most Efficient Quantity of Inventory</li> <li>• Inventory Record</li> <li>• Stock Record</li> <li>• Perpetual Inventory Using a Computer</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Why Merchandise Inventory is Important</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b></p>	<p><b>Determining the Cost of Merchandise Inventory:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• First-In, First-Out Inventory Costing Method</li> <li>• Last-In, First-Out Inventory Costing Method</li> <li>• Weighted-Average Inventory Costing Method</li> <li>• Calculating the Cost of Merchandise Sold</li> <li>• Inventory Costing Method and Actual Flow of Inventory</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Comparison of Inventory Methods</li> <li>• Lower of Cost or Market Inventory Costing Method</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>

## ACCOUNTING FOR INVENTORY (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b>Eliminating Inventory:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Gross Profit Method of Estimating Inventory</li> <li>• Estimating Inventory for Other Months</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: IKEA</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working papers 20-1, 20-2, and 20-3</li> <li>○ Application problems 20-1, 20-2, and 20-3</li> <li>○ Reinforcement activity 3, part A</li> </ul> </li> </ul>	

## ACCOUNTING FOR ACCRUALS, DEFERRALS, & REVERSING ENTRIES

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b>  <b>M7.9-12.3</b></p>	<p><b>Accruals:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Collecting a Note Receivable with Accrued Interest</li> <li>• Reversing Entry for Accrued Interest Income</li> <li>• Reversing Entry for Accrued Interest Expense</li> <li>• Paying an Installment Note Payable with Accrued Interest</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Analyzing Deferrals</li> <li>• Effect of Not Using Reversing Entries</li> <li>• Analyzing an Adjustment for Accrued Interest Expense</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>
<p><b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M7.9-12.1</b></p>	<p><b>Deferrals:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Recording Revenue Received in Advance</li> <li>• Recording Adjusting Entry for Deferred Revenue Earned</li> <li>• Recording an Expense Paid in Advance</li> <li>• Recording Adjusting Entry for Deferred Expenses Incurred</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Analyzing Deferrals</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>

## ACCOUNTING FOR ACCRUALS, DEFERRALS, & REVERSING ENTRIES (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b>  <b>M7.9-12.3</b></p>	<p><b>Preparing Adjusting Entries:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Uncollectible Accounts Adjustment</li> <li>• Merchandise Inventory Adjustment</li> <li>• Supplies-Store Adjustment</li> <li>• Prepaid Insurance Adjustment</li> <li>• Calculating Federal Income Tax</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• End-Of-Fiscal-Period Work</li> <li>• Unadjusted Trial Balance</li> <li>• Adjusted Trial Balance</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Anytime Fitness</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working papers 21-1 and 21-2</li> <li>○ Application problems 21-1 and 21-2</li> </ul> </li> </ul>	

## END-OF-FISCAL-PERIOD WORK FOR A CORPORATION

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b>Preparing an Income Statement, Statement of Stockholders Equity, &amp; Balance Sheet:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Income Statement</li> <li>• Statement of Stockholders’ Equity</li> <li>• Balance Sheet</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Additional Items on an Income Statement</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.2</b>  <b>M7.9-12.1</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b>Preparing a Statement of Cash Flows:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Statement of Cash Flows</li> <li>• Cash Flows from Operating, Investing, and Financing Activities</li> <li>• Investing Activities Section of a Statement of Cash flows</li> <li>• Financing Activities Section of a Statement of Cash flows</li> <li>• Operating Activities Section of a Statement of Cash Flows</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M7.9-12.1</b></p>	<p><b>Preparing Closing &amp; Reversing Entries:</b>  <u><b>Must be Covered:</b></u>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Closing Entry for Accounts with Credit Balance</li> <li>• Closing Entry for Accounts with Debit Balance</li> <li>• Closing Entry to Record Net income</li> <li>• Closing Entry for Dividends</li> <li>• Reversing Entries</li> <li>• Accounting Cycle for a Merchandising Business Organized as a Corporation</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: JP Morgan Chase and Co.</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working papers 22-1, 22-2, 22-3, and 22-4</li> <li>○ Application problems 22-1, 22-2, 22-3, and 22-4</li> <li>○ Reinforcement activity 3, part B</li> </ul> </li> </ul>	

## FORMING A PARTNERSHIP

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M5.9-12.3</b>  <b>M7.9-12.1</b>  <b>M7.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Initial investments by owners</li> <li>• Withdrawal of cash by partners</li> <li>• Withdrawal of supplies by partners</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Partnership agreements</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Jimmy John’s</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working paper 23-1</li> <li>○ Application problem 23-1</li> </ul> </li> </ul>	

## DISTRIBUTION OF NET INCOME & OWNERS' EQUITY STATEMENTS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b>  <b>M7.9-12.1</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Distribution of Net Income Statement</li> <li>• Distribution of Net Income Statement with unequal distribution</li> <li>• Partner’s Capital and Drawing Accounts</li> <li>• Owners’ Equity Statement</li> <li>• Balance Sheet for a Partnership</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Owner’s Equity Statement with an additional investment and a net loss.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Jimmy John’s</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working paper 23-2</li> <li>○ Application problem 23-2</li> </ul> </li> </ul>	

## DISSOLVING A PARTNERSHIP

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b>  <b>M3.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b>  <b>M7.9-12.1</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Account Balances Before Realization</li> <li>• Calculating Gain on Realization</li> <li>• Recording a Gain on Realization</li> <li>• Calculating Loss on Realization</li> <li>• Recording a Loss on Realization</li> <li>• Liquidating Liabilities</li> <li>• Distributing Remaining Cash to Partners</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working paper 23-3</li> <li>○ Application problem 23-3</li> </ul> </li> </ul>	

## RECORDING INTERNATIONAL SALES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b>  <b>M7.9-12.1</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• International Sales</li> <li>• International Sales Compared with Domestic Sales</li> <li>• Processing an International Sale</li> <li>• Collecting Payment for an International Sale</li> <li>• Journalizing an International Sale</li> <li>• Journalizing Time Drafts</li> <li>• Journalizing Cash Receipts from Time Drafts</li> <li>• Trade Acceptances</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Accounting in the real world: Lyft</li> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working paper 24-1</li> <li>○ Application problem 24-1</li> </ul> </li> </ul>	

## RECORDING INTERNET SALES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b>  <b>M7.9-12.1</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will learn about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Internet sales</li> <li>• Journalizing an internet sale</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      A-SSE.1, A-SSE.3.                      A-CED.1, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>Century 21 Accounting - General Journal</i> (Cengage, 2019):                             <ul style="list-style-type: none"> <li>○ Working paper 24-2</li> <li>○ Application problem 24-2</li> </ul> </li> </ul>	

# Advanced Placement Calculus AB

**Grade(s):** 9-12  
**Length:** two semesters  
**Credit:** 1.0 (0.5 per semester)  
**Prerequisite:** *Pre-Calculus* or teacher recommendation

## Overview:

This yearlong course is designed for learners capable of college level work, follows the description put forward by the College Board, and prepares them to take the Advanced Placement exam.

Both *AP Calculus AB* and *AP Calculus BC* focus on students' understanding of calculus concepts and provide experience with methods and applications. Through the use of big ideas of calculus (e.g., modeling change, approximation and limits, and analysis of functions), each course becomes a cohesive whole, rather than a collection of unrelated topics. Both courses require students to use definitions and theorems to build arguments and justify conclusions.

The courses feature a multi representational approach to calculus, with concepts, results, and problems expressed graphically, numerically, analytically, and verbally. Exploring connections among these representations builds understanding of how calculus applied limits to develop important ideas, definitions, formulas, and theorems. A sustained emphasis on clear communication of methods, reasoning, justifications, and conclusions is essential. Teachers and students should regularly use technology to reinforce relationships among functions, to confirm written work, to implement experimentation, and to assist in interpreting results.

*AP Calculus AB* is designed to be the equivalent of a first semester college calculus course devoted to topics in differential and integral calculus.

Please visit the College Board-AP Central website for more information (<http://apcentral.collegeboard.com>).

# Advanced Placement Calculus BC

**Grade(s):** 9-12

**Length:** two semesters

**Credit:** 1.0 (0.5 per semester)

**Prerequisite:** *AP Calculus AB* or equivalent

## Overview:

This yearlong course is designed for learners capable of college level work, follows the description put forward by the College Board, and prepares them to take the Advanced Placement exam.

Both *AP Calculus AB* and *AP Calculus BC* focus on students' understanding of calculus concepts and provide experience with methods and applications. Through the use of big ideas of calculus (e.g., modeling change, approximation and limits, and analysis of functions), each course becomes a cohesive whole, rather than a collection of unrelated topics. Both courses require students to use definitions and theorems to build arguments and justify conclusions.

The courses feature a multi representational approach to calculus, with concepts, results, and problems expressed graphically, numerically, analytically, and verbally. Exploring connections among these representations builds understanding of how calculus applied limits to develop important ideas, definitions, formulas, and theorems. A sustained emphasis on clear communication of methods, reasoning, justifications, and conclusions is essential. Teachers and students should regularly use technology to reinforce relationships among functions, to confirm written work, to implement experimentation, and to assist in interpreting results.

*AP Calculus BC* is designed to be the equivalent of both first and second semester college calculus courses. This course applies the content and skills learned in *AP Calculus AB* to parametrically defined curves, polar curves, and vector-valued functions; develops additional integration techniques and applications; and introduces the topics of sequences and series.

Please visit the College Board-AP Central website for more information (<http://apcentral.collegeboard.com>).

# Advanced Placement Computer Science A

**Grade(s):** 9-12  
**Length:** two semesters  
**Credit:** 1.0 (0.5 per semester)  
**Prerequisite:** *Computer Programming, Algebra 2*, or teacher recommendation

**Overview:**

This yearlong course is designed for learners capable of college level work, follows the description put forward by the College Board, and prepares them to take the Advanced Placement exam.

*AP Computer Science A* introduces students to computer science through programming. Fundamental topics in this course include the design of solutions to problems, the use of data structures to organize large sets of data, the development and implementation of algorithms to process data and discover new information, the analysis of potential solutions, and the ethical and social implications of computing systems. The course emphasizes object-oriented programming and design using the Java programming language.

*AP Computer Science A* is equivalent to a first-semester, college-level course in computer science.

Please visit the College Board-AP Central website for more information (<http://apcentral.collegeboard.com>).

# Advanced Placement Computer Science Principles

**Grade(s):** 9-12

**Length:** two semesters

**Credit:** 1.0 (0.5 per semester)

**Prerequisite:** *Algebra 1*

**Overview:**

This yearlong course is designed for learners capable of college level work, follows the description put forward by the College Board, and prepares them to take the Advanced Placement exam.

*AP Computer Science Principles* is an introductory college-level computing course that introduces students to the breadth of the field of computer science. Students learn to design and evaluate solutions, and to apply computer science to solve problems through the development of algorithms and programs. They incorporate abstraction into programs and use data to discover new knowledge. Students also explain how computing innovations and computing systems (including the internet) work, explore their potential impacts, and contribute to a computing culture that is collaborative and ethical.

Please visit the College Board-AP Central website for more information (<http://apcentral.collegeboard.com>).

# Algebra 2 & Honors

<p><b>Grade(s):</b> 9-12  <b>Length:</b> two semesters  <b>Credit:</b> 1 (0.5 per semester)  <b>Prerequisite:</b> <i>Algebra 1</i></p>	<p><b>Overview:</b>  <i>Algebra 2</i> continues students' study of functions including polynomial, exponential, rational, and radical functions. They build and interpret functions that model a relationship between two quantities by analyzing key features of the graphs and equations. Students make sense of periodic behavior as they study trigonometric functions and build fluency with values of sine, cosine, and tangent at various angle measures. Equation solving strategies expand to include higher degree polynomials and quadratics over the complex number system and exponential equations using the properties of logarithms. Transformations are included in all units pertaining to functions.</p> <p><b>Semester 2 of Algebra 2 fulfills the statistics graduation requirement</b> (semester one is a prerequisite). Concurrent enrollment in <i>Geometry</i> is an option.</p> <p><b><i>Algebra 2 Honors:</i></b>          Students will master all of the topics from <i>Algebra 2</i> listed above, with a variety of additional topics to include an in-depth study of asymptotic behaviors associated with radical and rational functions. These additional topics (content objectives) are documented within each unit in <b>RED</b>.</p>
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Mathematical Topics (Recommended Order)	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• Linear Functions and Systems</li> <li>• Quadratic Functions</li> <li>• Polynomials</li> <li>• Radical Functions</li> </ul>	<ul style="list-style-type: none"> <li>• Inferences and Conclusions from Data</li> <li>• Rational Functions</li> <li>• Exponential and Logarithmic Functions</li> <li>• Applications of Trigonometric Functions</li> <li>• <b>Conic Sections</b></li> </ul>

Course/ Grade Competencies	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> <li>• <b>M5.9-12.5:</b> The learner will identify, build, and perform operations on relations and functions and justify their reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M4.9-12.1:</b> The learner will provide rationale for solving measurement problems that require making conversions among various units and measurement systems, or applying the effect of a scale factor.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> <li>• <b>M5.9-12.5:</b> The learner will identify, build, and perform operations on relations and functions and justify their reasoning.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.2:</b> The learner will design and implement a plan to collect the appropriate data to answer the statistical question.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> <li>• <b>M7.9-12.6:</b> The learner will apply probability concepts to analyze and evaluate potential decisions and strategies.</li> </ul>

## LINEAR FUNCTIONS & SYSTEMS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M1.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Solve any linear equation.</li> <li>• Solve any linear inequality.</li> <li>• Solve compound inequalities.</li> <li>• Solve absolute value equations and inequalities.</li> </ul>	<p><b><u>AKSS</u></b> N-Q.1, N-Q.2, N-Q.3, A-REI.1, A-REI.3, A-CED.1, A-CED.4</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M3.9-12.1</b> <b>M3.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Solve systems of linear equations:               <ul style="list-style-type: none"> <li>○ Graphically</li> <li>○ Algebraically.</li> </ul> </li> <li>• Solve systems of linear inequalities.</li> <li>• Solve systems in three variables.</li> </ul>	<p><b><u>AKSS</u></b> A-REI.5, A-REI.6, A-REI.10, A-REI.11, A-REI.12, A-CED.2, A-CED.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 2</i> textbook: topic 1, lessons 1-3 and 5-6</li> </ul>	

## QUADRATIC FUNCTIONS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b> <b>M5.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Solve quadratic equations (to include equations with complex solutions) by:               <ul style="list-style-type: none"> <li>○ Inspection</li> <li>○ Square roots</li> <li>○ Factoring</li> <li>○ Completing the square</li> <li>○ Quadratic formula</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-REI.4e, A-REI.4f, N-CN.7</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M5.9-12.3</b> <b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Solve a system consisting of a linear and quadratic equation by graphing.</li> <li>• Solve a system consisting of a linear and quadratic equation algebraically.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-REI.7</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M2.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Perform arithmetic operations with complex numbers.               <ul style="list-style-type: none"> <li>○ Add, subtract and multiply.</li> </ul> </li> <li>• Find conjugates of complex numbers.</li> <li>• Use conjugates of complex numbers to divide complex numbers.</li> <li>• Extend polynomial identities to complex numbers.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> N-CN.1, N-CN.2, N-CN.3, N-N.8</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 2</i> textbook: topic 2, lessons 1-7</li> <li>• <i>Illustrative Mathematics Algebra 2</i>: unit 3, lessons 10-19 (<a href="https://im.kendallhunt.com/HS/students/3/index.html">https://im.kendallhunt.com/HS/students/3/index.html</a>)</li> </ul>	

## POLYNOMIALS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<b>M5.9-12.4</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Interpret key features of graphs and tables:                             <ul style="list-style-type: none"> <li>○ Extreme values</li> <li>○ Symmetry</li> <li>○ Vertex</li> <li>○ Zeros</li> <li>○ End behavior.</li> </ul> </li> <li>• Sketch graphs showing key features.</li> <li>• Factor an expression to find zeros.</li> <li>• Complete the square for a quadratic expression to find the vertex and axis of symmetry.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-IF.4, F-IF.7a, F-IF.7c, F-IF.8</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M5.9-12.5</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Transform functions:                             <ul style="list-style-type: none"> <li>○ Horizontal/vertical shifts</li> <li>○ Horizontal/vertical compression.</li> </ul> </li> <li>• Recognize even/odd functions from their graphs or equations.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-BF.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M5.9-12.1</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Add, subtract, and multiply polynomials.</li> <li>• Apply long and synthetic division to divide polynomials.</li> <li>• <b>Know and apply the Binomial Theorem.</b></li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-APR.1, <b>A-APR.5</b></p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M1.9-12.2</b> <b>M5.9-12.1</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Use Rational Root Theorem to solve polynomials.</li> <li>• Identify the roots of a polynomial.</li> <li>• Write the equation of a polynomial of least degree with given roots.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-APR.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 2</i> textbook: topic 3, lessons 1-7</li> <li>• <i>Illustrative Mathematics Algebra 2</i>: unit 2, lessons 1-15 and unit 5, lessons 1-7 (<a href="https://im.kendallhunt.com/HS/students/3/index.html">https://im.kendallhunt.com/HS/students/3/index.html</a>)</li> </ul>	

## RADICAL FUNCTIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<b>M5.9-12.1</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Rewrite radical expressions using rational exponents.</li> <li>• Simplify radical expressions.</li> <li>• Evaluate radical expressions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> N.RN.1, N.RN.2</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M1.9-12.2</b> <b>M5.9-12.1</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Solve radical equations and inequalities.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-REI.2, A-CED.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 2</i> textbook: topic 5, lessons 1-4</li> <li>• <i>Illustrative Mathematics Algebra 2</i>: unit 3, lessons 1-9 (<a href="https://im.kendallhunt.com/HS/students/3/index.html">https://im.kendallhunt.com/HS/students/3/index.html</a>)</li> </ul>	

## INFERENCE & CONCLUSIONS FROM DATA

### Graduate-Level Competency:

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<b>M7.9-12.1</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Understand and evaluate random processes underlying statistical experiments.                             <ul style="list-style-type: none"> <li>○ Identify a sampling method that provides a random sample from a population.</li> <li>○ Determine if a specified model (theoretical and empirical) is consistent with results from simulation.</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> S-IC.1, S-IC.2</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M7.9-12.2</b> <b>M7.9-12.4</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Make inferences and justify conclusions from sample surveys, experiments, and observational studies.                             <ul style="list-style-type: none"> <li>○ Identify the purpose of and differences between experiments, sample surveys, and observational studies.</li> <li>○ Use multiple samples to make an inference about a population.</li> <li>○ Use graphs and simulation to determine if differences between parameters is significant.</li> <li>○ Evaluate reports based on data.</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> S-IC.3, S-IC.4, S-IC.5, S-IC.6</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M7.9-12.3</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Summarize, represent, and interpret data on a single count or measurement variable.                             <ul style="list-style-type: none"> <li>○ Find measures of center and spread.</li> <li>○ Compare data sets using statistical measures that are appropriate.</li> <li>○ Fit a normal distribution to data.</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> S-ID.4</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M7.9-12.6</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Use probability to evaluate outcomes of decisions.                             <ul style="list-style-type: none"> <li>○ Use probabilities to make fair decisions.</li> <li>○ Analyze decisions and strategies using probability concepts.</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> S-MD.6, S-MD.7</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 2</i> textbook: topic 11, lessons 1-6 and <b>topic 12, lesson 6</b></li> <li>• <i>Illustrative Mathematics Algebra 2</i>: unit 7, lessons 1-16 (<a href="https://im.kendallhunt.com/HS/students/3/index.html">https://im.kendallhunt.com/HS/students/3/index.html</a>)</li> </ul>	

## RATIONAL FUNCTIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
M5.9-12.1	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Simplify rational expressions.</li> <li>• Multiply and divide rational expressions.</li> <li>• Add and subtract rational expressions.</li> <li>• Simplify complex fractions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-APR.6, A-APR.7</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
M1.9-12.2 M5.9-12.1	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Solve rational equations and inequalities.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-REI.2, A-CED.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
M5.9-12.5	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Graph rational functions:               <ul style="list-style-type: none"> <li>○ Piecewise</li> <li>○ Absolute value</li> <li>○ Step functions</li> <li>○ Any rational function and identify key features: asymptotes/ holes.</li> </ul> </li> <li>• Transform rational and radical functions.               <ul style="list-style-type: none"> <li>○ Horizontal/vertical shifts.</li> <li>○ Horizontal/vertical compression.</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-IF.7a, F-IF.7c, F.BF.3</p> <p><b><u>Mathematical Practices</u></b></p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 2</i> textbook: topic 4, lessons 1-5 and topic 5, lessons 5-6</li> <li>• <i>Illustrative Mathematics Algebra 2</i>: unit 2, lessons 16-24 (<a href="https://im.kendallhunt.com/HS/students/3/index.html">https://im.kendallhunt.com/HS/students/3/index.html</a>)</li> </ul>	

## EXPONENTIAL & LOGARITHMIC FUNCTIONS

### Graduate-Level Competency:

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<b>M5.9-12.4</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Distinguish between situations that are linear, quadratic, or exponential.</li> <li>• Graph exponential growth and decay.</li> <li>• Write exponential functions from:                             <ul style="list-style-type: none"> <li>○ A graph</li> <li>○ A table</li> <li>○ A description.</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-LE.1a, F-LE.1b, F-LE.1c, F-LE.2, F-LE.3, F-IF.7</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M5.9-12.5</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Graph and recognize inverse relations and functions.</li> <li>• Find inverses of functions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-IF.7, F-BF.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M5.9-12.1</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Write logarithmic functions.</li> <li>• Graph logarithmic functions.</li> <li>• Evaluate logarithmic functions.</li> <li>• Simplify logarithmic functions.</li> <li>• Translate between logarithms in any base.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-LE.2, F-LE.4, F-BF.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M5.9-12.1</b> <b>M5.9-12.2</b> <b>M5.9-12.3</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Write equivalent forms for exponential and logarithmic functions.</li> <li>• Solve exponential and logarithmic equations and inequalities.</li> <li>• Model data using exponential and logarithmic functions.</li> <li>• Use exponential and logarithmic functions to analyze and predict.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-CED.1, A-CED.3, A-REI.11</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 2</i> textbook: topic 6, lessons 1-6</li> <li>• <i>Illustrative Mathematics Algebra 2</i>: unit 4, lessons 1-18 (<a href="https://im.kendallhunt.com/HS/students/3/index.html">https://im.kendallhunt.com/HS/students/3/index.html</a>)</li> </ul>	

## APPLICATIONS OF TRIGONOMETRIC FUNCTIONS

### Graduate-Level Competency:

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M4.9-12.1</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Convert between radians, degrees, and degree/minute/second.</li> <li>• Extend the domain of trig functions using the unit circle.</li> <li>• Evaluate all six trig functions for exact values.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      N-Q.3, F-TF.2,                      F-TF.3</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Use inverse trigonometric functions to solve trigonometric equations.</li> <li>• Prove and apply trigonometric functions - Pythagorean Identity.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>•</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      F-TF.7, F-TF.8</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 2</i> textbook: topic 7, lessons 1-3 and topic 8, lessons 1 and 3</li> <li>• <i>Illustrative Mathematics Algebra 2</i>: unit 6, lessons 1-19 (<a href="https://im.kendallhunt.com/HS/students/3/index.html">https://im.kendallhunt.com/HS/students/3/index.html</a>)</li> </ul>	

## CONIC SECTIONS

(This is an optional unit for Algebra 2, if time allows.)

**Graduate-Level Competency:**

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M5.9-12.1</b> <b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• <b>Graph conic sections:</b> <ul style="list-style-type: none"> <li>○ Circles</li> <li>○ Parabolas</li> <li>○ Ellipses</li> <li>○ Hyperbolas</li> </ul> </li> <li>• <b>Transform conic sections:</b> <ul style="list-style-type: none"> <li>○ Horizontal/vertical shifts</li> <li>○ Horizontal/vertical compression</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F.BF.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M5.9-12.1</b> <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• <b>Write equations of conic sections:</b> <ul style="list-style-type: none"> <li>○ Circles</li> <li>○ Parabolas</li> <li>○ Ellipses</li> <li>○ Hyperbolas</li> </ul> </li> <li>• <b>Derive the equations of ellipses and hyperbolas given foci and directrices.</b></li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> G-GPE.1, G-GPE.2, F-IF.8, G-GPE.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>enVision Algebra 2</i> textbook: topic 9, lessons 1-4</li> </ul>	

# Algebra for Finance 1A/1B

<p><b>Grade(s):</b> 9-12  <b>Length:</b> one or two semesters  <b>Credit:</b> 0.5 per semester  <b>Prerequisite:</b> <i>Algebra 1.</i></p>	<p><b>Overview:</b>  <i>Algebra for Finance 1A/1B</i> applies computational skills to real world consumer situations. The content includes: algebra, linear equations and inequalities, graphing, exponential growth, present and future value of money, interest (simple/compound), credit cards (credit scores, finance charges, deferred payments, etc.), mortgages (fees, points, expenses, interest, fixed/adjustable interest rates, balloon payments, etc.), personal budgets, cash management strategies, net worth calculations, debt payoff, tax forms with tax tables, insurance (options, fees, expenses, etc.), retirement plans (savings, IRA's, ROTH, annuities, etc.), and stocks (gains, losses, selling, preferred/common stock, bonds).</p> <p>Students can take <i>Algebra for Finance 1B</i> without taking <i>Algebra for Finance 1A</i>.</p>
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<b>Mathematical Topics</b> (Recommended Order)	
<b>Semester 1</b> ( <i>Algebra for Finance 1A</i> )	<b>Semester 2</b> ( <i>Algebra for Finance 1B</i> )
<ul style="list-style-type: none"> <li>• Discretionary Expenses</li> <li>• Banking Services</li> <li>• Consumer Credit</li> <li>• Automobile Ownership</li> <li>• Employment Basics</li> <li>• Income Taxes</li> </ul>	<ul style="list-style-type: none"> <li>• Independent Living</li> <li>• The Stock Market</li> <li>• Modeling a Business</li> <li>• Planning for Retirement</li> <li>• Prepare a Budget</li> </ul>

## Course/ Grade Competencies

Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M4.9-12.1:</b> The learner will provide rationale for solving measurement problems that require making conversions among various units and measurement systems, or applying the effect of a scale factor.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> <li>• <b>M6.9-12.1:</b> The learner will apply geometric theorems and postulates to solve problems, create arguments, and support their reasoning.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> <li>• <b>M7.9-12.5:</b> The learner will interpret descriptive statistics and linear models within the context of the data and the original question.</li> <li>• <b>M7.9-12.6:</b> The learner will apply probability concepts to analyze and evaluate potential decisions and strategies.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> <li>• <b>M5.9-12.5:</b> The learner will identify, build, and perform operations on relations and functions and justify their reasoning.</li> <li>• <b>M6.9-12.3:</b> The learner will create and use a formal geometric construction, using appropriate tools, to illustrate geometric properties.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.2:</b> The learner will design and implement a plan to collect the appropriate data to answer the statistical question.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> <li>• <b>M7.9-12.5:</b> The learner will interpret descriptive statistics and linear models within the context of the data and the original question.</li> <li>• <b>M7.9-12.6:</b> The learner will apply probability concepts to analyze and evaluate potential decisions and strategies.</li> </ul>

## DISCRETIONARY EXPENSES

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b>  <b>M7.9-12.1</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b></p>	<p><b>Discretionary &amp; Essential Expenses:</b>  <u><b>Must be Covered:</b></u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Identify the difference between essential and discretionary expenses.</li> <li>• Determine the mean, median, and mode of a data set.</li> <li>• Use sigma notation to represent and determine the mean of a data set.</li> <li>• Create and interpret a frequency distribution table.</li> </ul> <p><u><b>Can be Covered:</b></u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Determine the mean, median, and mode of a data set presented in a frequency distribution table.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-CED.1.                      A-CED.2, A-CED.4.                      A-REI.1, F-IF.5.                      F-LE.2, F-LE.1</p> <p><u><b>Mathematical Practices</b></u>                      Make sense of problems and persevere in solving them.                      Reason abstractly and quantitatively.                      Use appropriate tools strategically.</p>
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M5.9-12.4</b></p>	<p><b>Travel Expenses:</b>  <u><b>Must be Covered:</b></u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Determine and interpret cumulative frequency.</li> <li>• Determine and interpret relative frequency.</li> <li>• Determine and interpret relative cumulative frequency.</li> <li>• Determine and interpret percentiles.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-CED.2.                      A-CED.3, A-CED.4</p> <p><u><b>Mathematical Practices</b></u>                      Reason abstractly and quantitatively</p>
<p><b>M1.9-12.1</b>  <b>M2.9-12.1</b>  <b>M5.9-12.4</b></p>	<p><b>Vacation Expenses:</b>  <u><b>Must be Covered:</b></u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Measure dispersion using standard deviation units.</li> <li>• Compute z-scores.</li> <li>• Find percentages using the normal curve.</li> <li>• Compute raw scores using z-scores.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-CED.2.                      A-CED.4</p> <p><u><b>Mathematical Practices</b></u>                      Use appropriate tools strategically.</p>

## DISCRETIONARY EXPENSES (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M4.9-12.1</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b>  <b>M7.9-12.6</b></p>	<p><b>Personal Expenses:</b>  <u><b>Must be Covered:</b></u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Graph bivariate data.</li> <li>• Interpret patterns and trends based on data.</li> <li>• Construct a scatter plot.</li> <li>• Fit a linear regression equation to a scatter plot.</li> <li>• Determine the linear regression equation.</li> <li>• Find and interpret the correlation coefficient.</li> <li>• Make predictions based on lines of best fit.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-CED.1.                      A-CED.4, A-REI.1.                      A-REI.10, F-IF.5.                      F-IF.6, F-IF.7.                      F-LE.2, F-LE.1</p> <p><u><b>Mathematical Practices</b></u>                      Reason abstractly and quantitatively                      Use appropriate tools strategically.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Students plan their #1 bucket list vacation.</li> <li>• Guest speaker from a travel agency.</li> </ul>	

## BANKING SERVICES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b></p>	<p><b>Checking Accounts:</b>  <u>Must be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Explain how checking accounts work.</li> <li>• Complete a check register.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-CED.4</p> <p><u><b>Mathematical Practices</b></u>                      Make sense of problems and persevere in solving them. Attend to precision.</p>
<p><b>M1.9-12.2</b>  <b>M5.9-12.1</b></p>	<p><b>Reconcile a Bank Statement:</b>  <u>Must be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Reconcile a checking account with a bank statement.</li> </ul> <p><u>Can be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Reconcile a checking account with a bank statement using a spreadsheet.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-CED.4.</p> <p><u><b>Mathematical Practices</b></u>                      Make sense of problems and persevere in solving them. Attend to precision.</p>
<p><b>M1.9-12.1</b></p>	<p><b>Savings Account:</b>  <u>Must be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Define the basic vocabulary of savings accounts.</li> <li>• Compute simple interest using the simple interest formula.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.4.                      A-CED.1, A-CED.2.                      A-REI.1.</p> <p><u><b>Mathematical Practices</b></u>                      Make sense of problems and persevere in solving them. Attend to precision.</p>
<p><b>M1.9-12.2</b>  <b>M2.9-12.1</b></p>	<p><b>Explore Compound Interest:</b>  <u>Must be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Explain the concept of getting interest on your interest.</li> <li>• Compute compound interest using a table.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-SSE.4.                      A-CED.2, F-LE.2</p> <p><u><b>Mathematical Practices</b></u>                      Attend to precision.</p>

## BANKING SERVICES (continued)

Course/ Grade Competency	Content Objectives	Standards
<b>M1.9-12.1</b> <b>M2.9-12.1</b>	<b>Compound Interest Formula:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Understand the derivation of the compound interest formula.</li> </ul> Make computations using the compound interest formula.	<u><b>AKSS</b></u> A-SSE.4, A-CED.2  <u><b>Mathematical Practices</b></u> Make sense of problems and persevere in solving them. Attend to precision.
<b>M1.9-12.1</b> <b>M1.9-12.2</b> <b>M2.9-12.1</b>	<b>Continuous Compounding:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Compute interest on an account that is continuously compounded.</li> </ul>	<u><b>AKSS</b></u> A-SSE.1., A-SSE.4. A-CED.2  <u><b>Mathematical Practices</b></u> Make sense of problems and persevere in solving them. Attend to precision.
<b>M1.9-12.1</b> <b>M1.9-12.2</b> <b>M2.9-12.1</b> <b>M5.9-12.1</b>	<b>Future Value of Investments:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Calculate the future value of a periodic investment.</li> <li>Graph the future value function.</li> <li>Interpret the graph of the future value function.</li> </ul>	<u><b>AKSS</b></u> A-SSE.1, A-SSE.4. A-CED.2, F-IF.5. F-IF.7, F-LE.2. F-LE.1  <u><b>Mathematical Practices</b></u> Reason abstractly and Quantitatively. Attend to precision.
<b>M1.9-12.2</b> <b>M2.9-12.1</b> <b>M5.9-12.1</b>	<b>Present Value of Investment:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Calculate the present value of a single deposit investment.</li> <li>Calculate the present value of a periodic deposit investment.</li> </ul>	<u><b>AKSS</b></u> A-SSE.1, A-SSE.4. A-CED.2.  <u><b>Mathematical Practices</b></u> Attend to precision.
<b>M3.9-12.1</b> <b>M3.9-12.3</b>	<b>The Term of a Single Deposit Amount:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Construct exponential and logarithmic models of a situation.</li> <li>Evaluate logarithms.</li> <li>Express exponential models as logarithms.</li> <li>Demonstrate use of the change-of-base formula.</li> <li>Evaluate common and natural logarithms.</li> </ul>	<u><b>AKSS</b></u> A-SSE.1, A-CED.4. F-LE.2, F-LE.4. F-LE.1  <u><b>Mathematical Practices</b></u> Make sense of problems and persevere in solving them. Use appropriate tools strategically.

## BANKING SERVICES (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M3.9-12.1</b>  <b>M3.9-12.3</b>  <b>M4.9-12.1</b></p>	<p><b>The Term of a Systematic Account:</b>  <u><b>Must be Covered:</b></u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Demonstrate use of the Change-of-Base Formula.</li> <li>• Explain and apply the One-to-One Property.</li> <li>• Explain and apply the Power Property.</li> <li>• Determine the term of systematic savings.</li> <li>• Determine the term of systematic withdrawal.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-SSE.1, A-CED.3.                      A-CED.4.</p> <p style="text-align: center;"><u><b>Mathematical Practices</b></u>                      Use appropriate tools strategically.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Guest speaker – banker or investment manager</li> <li>• Simulated bank reconciliation</li> </ul>	

## CONSUMER CREDIT

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b> <b>M2.9-12.1</b></p>	<p><b>Introduction to Consumer Credit:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Define basic credit terms.</li> <li>• Identify types of lending institutions.</li> <li>• Compute finance charges for installment purchases.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.1, A-REI.1</p> <p><b><u>Mathematical Practices</u></b> Use appropriate tools strategically.</p>
<p><b>M1.9-12.2</b> <b>M3.9-12.2</b> <b>M5.9-12.3</b></p>	<p><b>Loans:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Read monthly payments from a table.</li> <li>• Compute monthly payments using a formula.</li> <li>• Compute finance charges on loans.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.2</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.</p>
<p><b>M3.9-12.3</b> <b>M5.9-12.3</b></p>	<p><b>Student Loans:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Explain the options available for student loans.</li> <li>• Calculate the interest due in various student loan situations.</li> <li>• Apply the simplified daily interest formula.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about interest capitalization.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.1, A-REI.1</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Reason abstractly and quantitatively</p>

## CONSUMER CREDIT (continued)

Course/ Grade Competency	Content Objectives	Standards
<b>M1.9-12.2</b> <b>M7.9-12.1</b> <b>M7.9-12.4</b>	<b>Loan Calculations and Regression:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Determine the interest on a loan given the principle, time, and annual percentage rate (APR).</li> <li>Use the logarithmic loan length formula to determine the term of a loan.</li> <li>Use regression to determine the curve of best fit using data from a loan table.</li> </ul>	<u>AKSS</u> A-SSE.1, A-SSE.4. A-CED.2, A-CED.3. A-CED.4, F-LE.2. F-LE.1, F-LE.4  <u>Mathematical Practices</u> Make sense of problems and persevere in solving them. Reason abstractly and quantitatively Use appropriate tools strategically.
<b>M1.9-12.2</b> <b>M3.9-12.1</b>	<b>Credit Cards:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Define the basic vocabulary of credit cards.</li> <li>Compute an average daily balance.</li> </ul>	<u>AKSS</u> A-SSE.1, A-SSE.4. A-CED.1., A-CED.2. A-REI.1, F-IF.6  <u>Mathematical Practices</u> Use appropriate tools strategically.
<b>M1.9-12.2</b> <b>M3.9-12.1</b>	<b>Credit Card Statement:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Identify and use the various entries in a credit card statement.</li> </ul>	<u>AKSS</u> A-REI.1.  <u>Mathematical Practices</u> Attend to precision.
<b>M1.9-12.2</b> <b>M3.9-12.1</b> <b>M4.9-12.1</b>	<b>Average Daily Balance:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Calculate the average daily balance using the credit calendar.</li> <li>Calculate the finance charge using the credit calendar.</li> </ul> <u>Can be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Learn about negative amortization.</li> </ul>	<u>AKSS</u> A-SSE.1, A-CED.1. A-CED.2, A-REI.1.  <u>Mathematical Practices</u> Attend to precision. Use appropriate tools strategically.
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>Compare credit card rates and benefits.</li> </ul>	

## AUTOMOBILE OWNERSHIP

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<b>M1.9-12.1</b> <b>M2.9-12.1</b>	<b>Automobile Ads:</b> <u><b>Must be Covered:</b></u> The learner will: <ul style="list-style-type: none"> <li>• Compute the cost of classified ads for used cars.</li> <li>• Compute the cost of sales tax on automobiles.</li> </ul>	<u><b>AKSS</b></u> A-SSE.1, A-CED.1. A-CED.2, A-REI.1.  <u><b>Mathematical Practices</b></u> Attend to precision.
<b>M7.9-12.3</b> <b>M7.9-12.4</b> <b>M7.9-12.5</b>	<b>Automobile Transactions:</b> <u><b>Must be Covered:</b></u> The learner will: <ul style="list-style-type: none"> <li>• Compute quartiles and interquartile range.</li> <li>• Create a frequency distribution from a set of data.</li> <li>• Use box-and-whisker plots and stem-and-leaf plots to display information.</li> </ul> <u><b>Can be Covered:</b></u> The learner will: <ul style="list-style-type: none"> <li>• Use a modified box plot.</li> </ul>	<u><b>AKSS</b></u> A-SSE.1, A-SSE.4. A-CED.2, A-CED.4. F-IF.4, F-IF.5. F-LE.2.  <u><b>Mathematical Practices</b></u> Use appropriate tools strategically.
<b>M2.9-12.1</b> <b>M7.9-12.5</b>	<b>Automobile Insurance:</b> <u><b>Must be Covered:</b></u> The learner will: <ul style="list-style-type: none"> <li>• Identify different types of auto insurance coverage.</li> <li>• Compute insurance costs.</li> <li>• Compute payments on insurance claims.</li> </ul> <u><b>Can be Covered:</b></u> The learner will: <ul style="list-style-type: none"> <li>• Learn about emergency road service insurance.</li> <li>• Learn about car rental insurance.</li> </ul>	<u><b>AKSS</b></u> A-SSE.1, A-CED.1. A-CED.2, A-CED.3. A-CED.4, A-REI.1. F-IF.4.  <u><b>Mathematical Practices</b></u> Make sense of problems and persevere in solving them. Attend to precision.

## AUTOMOBILE OWNERSHIP (continued)

Course/ Grade Competency	Content Objectives	Standards
<p>M7.9-12.3 M7.9-12.4 M7.9-12.5 M7.9-12.6</p>	<p><b>Probability – The Basis of Insurance:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Explain how to interpret two-way tables.</li> <li>• Compute conditional probabilities based on two-way tables.</li> <li>• Determine if two events are independent.</li> <li>• Interpret Venn diagrams.</li> <li>• Create Venn diagrams</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-CED.2. A-CED.4, F-IF.4. F-LE.2</p> <p><b><u>Mathematical Practices</u></b> Reason abstractly and Quantitatively. Use appropriate tools strategically.</p>
<p>M1.9-12.2</p>	<p><b>Linear Automobile Depreciation:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Write, interpret, and graph a straight line depreciation equation.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-CED.1, A-REI.1. A-REI.3, A-REI.10. F-IF.6, F-LE.2</p> <p><b><u>Mathematical Practices</u></b> Attend to precision.</p>
<p>M1.9-12.1 M1.9-12.2 M2.9-12.1 M3.9-12.1 M3.9-12.3</p>	<p><b>Historical and Exponential Depreciation:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Write, interpret, and graph and exponential depreciation equation.</li> <li>• Manipulate the exponential depreciation equation in order to determine time, original price, and depreciated value.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about geometric sequences.</li> <li>• Learn about geometric progression.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.4, A-CED.2. A-CED.3, A-CED.4. F-IF.4, F-IF.7. F-LE.2, F-LE.1.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Use appropriate tools strategically.</p>
<p>M4.9-12.1</p>	<p><b>Driving Data:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Write, interpret, and use the distance formula.</li> <li>• Use the formula for the relationship between distance, fuel economy, and gas usage.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Will learn about the currency exchange rate.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-CED.2. A-CED.3, A-CED.4. F-IF.4, F-IF.6.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them.</p>

## AUTOMOBILE OWNERSHIP (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M4.9-12.1</b> <b>M5.9-12.2</b></p>	<p><b>Driving Safety Data:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Calculate reaction time and distance in the English Standard System.</li> <li>• Calculate and use the braking distance in both the English Standard and metric systems.</li> <li>• Calculate and use the total stopping distance in both the English Standard and metric systems.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-CED.1. A-CED.2, A-CED.4. A-REI.1, F-IF.4.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.</p>
<p><b>M4.9-12.1</b> <b>M6.9-12.1</b></p>	<p><b>Accident Investigation Data:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Determine the minimum skid speed using the skid mark formula.</li> <li>• Determine the minimum skid speed using the yaw mark formula.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-CED.1. A-CED.2, A-CED.4. A-REI.1, F-IF.4.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Guest speaker – insurance agent</li> <li>• Driver safety – Ask Cherokee Riders to talk with students about passing their driving tests.</li> </ul>	

## EMPLOYMENT BASICS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M2.9-12.1</b></p>	<p><b>Looking for Employment:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Compute periodic salary based on annual contract salary.</li> <li>• Interpret abbreviations in classified ads.</li> <li>• Express classified ad prices as piecewise functions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-CED.1. A-REI.1.</p> <p><b><u>Mathematical Practices</u></b> Use appropriate tools strategically.</p>
<p><b>M1.9-12.2</b></p>	<p><b>Pay Periods and Hourly Rates:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Compute weekly, semimonthly, and biweekly earnings given annual salary.</li> <li>• Compute hourly pay and overtime pay given hourly rate.</li> <li>• Compute annual salaries based on annual percentage increases.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.1, A-CED.2. A-CED.4, A-REI.1. F-IF.4, F-IF.6.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision.</p>
<p><b>M3.9-12.1</b> <b>M4.9-12.1</b></p>	<p><b>Commissions, Royalties, and Piecework Pay:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Compute pay based on percent commission.</li> <li>• Compute piecework pay.</li> <li>• Explain advantages and disadvantages of pay based on production.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.4, A-CED.1. A-CED.2, A-CED.4. A-REI.1, F-IF.4.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision.</p>

## EMPLOYMENT BASICS (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M5.9-12.2</b> <b>M5.9-12.3</b></p>	<p><b>Employee Benefits:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Explain and calculate the value of certain employee benefits.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will: Learn about childcare leave</p>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.4, A-CED.1. A-CED.2, A-CED.4. A-REI.1, F-IF.4.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them.</p>
<p><b>M5.9-12.3</b></p>	<p><b>Social Security and Medicare:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Compute paycheck deductions for Social Security.</li> <li>• Compute paycheck deductions for Medicare.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.4, A-CED.1. A-REI.1.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Guest speaker – temp agency hiring manager</li> <li>• Invite car dealership to talk about commission</li> </ul>	

## INCOME TAXES

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<b>M1.9-12.1</b> <b>M2.9-12.1</b>	<b>Tax Tables, Worksheets, and Schedules:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Express tax schedules algebraically.</li> <li>Compute federal income taxes using a tax table and tax schedules.</li> </ul>	<u>AKSS</u> A-SSE.1, A-SSE.4, A-CED.1, A-CED.2. A-REI.1.  <u>Mathematical Practices</u> Attend to precision. Use appropriate tools strategically.
<b>M3.9-12.3</b>	<b>Modeling Tax Schedules:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Construct income tax graphs using compound equations.</li> </ul>	<u>AKSS</u> F-LE.1.  <u>Mathematical Practices</u> Use appropriate tools strategically.
<b>M1.9-12.1</b> <b>M5.9-12.3</b>	<b>Income Statements:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Interpret and use the information on a pay stub, W-2 form, and 1099 form.</li> </ul>	<u>AKSS</u> A-SSE.1, A-CED.4.  <u>Mathematical Practices</u> Attend to precision.
	<b>Forms 1040EZ and 1040A:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>Complete Form 1040EZ.</li> <li>Complete Form 1040A.</li> </ul>	<u>AKSS</u> A-SSE.1, A-CED.4.  <u>Mathematical Practices</u> Make sense of problems and persevere in solving them. Attend to precision.
	<b>Form 1040 and Schedules A and B:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>File Form 1040 with itemized deductions.</li> <li>Explain the difference between a tax credit and a tax deduction.</li> </ul>	<u>AKSS</u> A-REI.1.  <u>Mathematical Practices</u> Make sense of problems and persevere in solving them. Attend to precision.
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>Ask H&amp;R Block to talk about tax season</li> <li>TurboTax: Using TurboTax to Teach Tax Basics (<a href="https://www.intuit.com/partners/education-program/products/turbotax/">https://www.intuit.com/partners/education-program/products/turbotax/</a>)</li> </ul>	

## INDEPENDENT LIVING

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M7.9-12.1</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b>  <b>M7.9-12.4</b>  <b>M7.9-12.5</b>  <b>M7.9-12.6</b></p>	<p><b>Finding a Place to Live:</b>  <u>Must be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Calculate the affordability of a monthly rent.</li> <li>• Determine the relationship between square footage and monthly rent.</li> <li>• Determine lease signing costs.</li> <li>• Calculate moving expenses.</li> </ul>	<p style="text-align: center;"><u>AKSS</u>                      A-SSE.1, A-SSE.4.                      A-CED.1, A-CED.2.                      A-CED.3, A-CED.4.                      A-REI.1, F-IF.4.</p> <p><u>Mathematical Practices</u>                      Make sense of problems and persevere in solving them. Attend to precision.</p>
<p><b>M6.9-12.3</b></p>	<p><b>Reading a Floorplan:</b>  <u>Must be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Compute the perimeter and the area of a polygon.</li> <li>• Compute areas of irregular regions.</li> <li>• Compute volumes of rectangular solids.</li> </ul> <p><u>Can be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• The Monte Carlo method.</li> </ul>	<p style="text-align: center;"><u>AKSS</u>                      A-CED.1, A-CED.2.                      A-CED.4, A-REI.1.                      F-IF.4, G-GMD.3.                      G-MG.2.</p> <p><u>Mathematical Practices</u>                      Attend to precision. Use appropriate tools strategically.</p>
<p><b>M3.9-12.1</b>  <b>M3.9-12.2</b></p>	<p><b>Mortgage Application Process:</b>  <u>Must be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Compute the monthly cost of paying for a house.</li> <li>• Explain the research that is necessary before you purchase a home.</li> </ul>	<p style="text-align: center;"><u>AKSS</u>                      A-SSE.1, A-SSE.4.                      A-CED.1, A-CED.2.                      A-CED.3, A-REI.1.</p> <p><u>Mathematical Practices</u>                      Make sense of problems and persevere in solving them. Attend to precision.</p>

## INDEPENDENT LIVING (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M3.9-12.3</b></p>	<p><b>Purchasing a Home:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Estimate closing costs.</li> <li>• Create an amortization table for a fixed-rate mortgage.</li> <li>• Create an amortization table for a fixed-rate mortgage with extra payments.</li> </ul> <p>Investigate the amortization table for an adjustable-rate mortgage.</p>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.1, A-CED.2. A-CED.3, A-CED.4. A-REI.1.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Use appropriate tools strategically.</p>
<p><b>M3.9-12.2</b></p>	<p><b>Mortgage Points:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Calculate discount points for a mortgage.</li> <li>• Determine the breakeven time for discount points.</li> <li>• Calculate negative points.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.1, A-CED.2. A-CED.3, A-CED.4. A-REI.1, F-IF.5.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision.</p>
<p><b>M3.9-12.3</b></p>	<p><b>Rentals, Condominiums, and Cooperatives:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Compute the costs of purchasing a cooperative or a condominium.</li> <li>• Explain the advantages and disadvantages of purchasing different types of homes.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about landminium.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.1, A-CED.2. A-CED.3, A-CED.4. A-REI.1.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Use Zillow (<a href="https://www.zillow.com/">https://www.zillow.com/</a>) to compare rent rates on places in Fairbanks and other areas.</li> <li>• Guest speaker: banker about mortgage points</li> <li>• Guest speaker: State Farm about renter’s insurance</li> </ul>	

## THE STOCK MARKET

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M3.9-12.3</b></p>	<p><b>Business Organization:</b> <b>Must be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• State the basic vocabulary of business organizations.</li> <li>• Compute financial responsibility of business ownership based on ratios and percents.</li> </ul>	<p><b>AKSS</b> A-SSE.1, A-SSE.4. A-CED.2, A-CED.3. A-CED.4.</p> <p><b>Mathematical Practices</b> Make sense of problems and persevere in solving them.</p>
<p><b>M1.9-12.2</b> <b>M2.9-12.1</b></p>	<p><b>Stock Market Data:</b> <b>Must be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• Use stock data to follow the daily progress of a corporate stock.</li> <li>• Write spreadsheet formulas.</li> </ul> <p><b>Can be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about after-hours trading.</li> </ul>	<p><b>AKSS</b> A-SSE.1, A-CED.2. A-CED.3, A-CED.4.</p> <p><b>Mathematical Practices</b> Reason abstractly and quantitatively. Use appropriate tools strategically.</p>
<p><b>M2.9-12.1</b> <b>M5.9-12.5</b></p>	<p><b>Stock Market Data Charts:</b> <b>Must be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• Interpret a stock bar chart.</li> <li>• Create a stock bar chart.</li> <li>• Interpret a stock candlestick chart.</li> <li>• Create a stock candlestick chart.</li> </ul>	<p><b>AKSS</b> A-SSE.1, A-REI.10. F-IF.5, F-IF.7.</p> <p><b>Mathematical Practices</b> Construct viable arguments and critique the reasoning of others. Reason abstractly and quantitatively Use appropriate tools strategically.</p>

## THE STOCK MARKET (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b> <b>M7.9-12.3</b></p>	<p><b>Trends in Stock Closing Prices:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Explain how data is smoothed.</li> <li>• Calculate simple moving averages using the arithmetic average formula.</li> <li>• Calculate simple moving averages using the subtraction and addition method.</li> <li>• Graph simple moving averages using a spreadsheet.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about regression analysis.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.1, A-CED.2. A-REI.1, A-REI.10. F-IF.5, F-IF.6. F-IF.7, F-LE.2.</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Use appropriate tools strategically.</p>
<p><b>M3.9-12.2</b></p>	<p><b>Stock Market Ticker:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Explain stock market ticker information.</li> <li>• Determine the total value of a trade from ticker information.</li> <li>• Determine trade volume from ticker information.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-CED.1. A-REI.1.</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> Use appropriate tools strategically.</p>
<p><b>M1.9-12.2</b> <b>M2.9-12.1</b></p>	<p><b>Stock Transactions:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Define the basic vocabulary of buying and selling shares of stock.</li> <li>• Compute gains and losses from stock trades.</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about odd lot.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.4, A-CED.1. A-CED.2, A-REI.1.</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> Reason abstractly and Quantitatively. Use appropriate tools strategically.</p>
<p><b>M1-9-12.1</b></p>	<p><b>Stock Transaction Fees:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Compute the fees involved in buying and selling stocks.</li> <li>• Define the basic vocabulary of stock trading.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-CED.1, A-CED.3. A-REI.1.</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> Attend to precision.</p>

## THE STOCK MARKET (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M3.9-12.2</b></p>	<p><b>Stock Splits:</b> <b>Must be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• Calculate the post-split outstanding shares and share price for a traditional split.</li> <li>• Calculate the post-split outstanding shares and share prices for a reverse split.</li> <li>• Calculate the fractional value amount that a shareholder receives after a split.</li> </ul> <p><b>Can be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about penny stocks.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p style="text-align: center;">A-SSE.1. A-SSE.4. A-CED.1. A-CED.2. A-CED.3. A-REI.1.</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> Attend to precision. Use appropriate tools strategically.</p>
<p><b>M3.9-12.2</b></p>	<p><b>Dividend Income:</b> <b>Must be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• Understand the concept of shareowners splitting the profit of the corporation they own.</li> <li>• Compute dividend income.</li> <li>• Compute the yield for a given stock.</li> <li>• Compute the interest earned on corporate bonds.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p style="text-align: center;">A-SSE.1. A-SSE.4. A-CED.1. A-CED.2. A-REI.1.</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Play the stock market game against other schools in Alaska and worldwide (<a href="https://www.stockmarketgame.org">https://www.stockmarketgame.org</a>).</li> </ul>	

## MODELING A BUSINESS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M5.9-12.5</b> <b>M7.9-12.6</b></p>	<p><b>Inventions:</b> <b>Must be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• Describe how to choose sample subjects without bias.</li> <li>• Use a random number table.</li> <li>• Explain methods used to reduce bias in experiments.</li> <li>• Create diagrams for experimental designs.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-CED.2, F-IF.5, F-IF.7, F-LE.2.</p> <p><b><u>Mathematical Practices</u></b> Look for and make use of structure. Reason abstractly and quantitatively. Use appropriate tools strategically.</p>
<p><b>M5.9-12.1</b> <b>M7.9-12.3</b></p>	<p><b>Market Research:</b> <b>Must be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• Compute combinations.</li> <li>• Compute unbiased estimators.</li> <li>• Determine if a statistic is biased or unbiased.</li> <li>• Critique sampling techniques.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.1, A-CED.2, A-CED.3, A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> Look for and express regularity in repeated reasoning. Reason abstractly and quantitatively. Use appropriate tools strategically.</p>
<p><b>M3.9-12.2</b></p>	<p><b>Supply and Demand:</b> <b>Must be Covered:</b> The learner will:</p> <ul style="list-style-type: none"> <li>• Describe the slopes of the supply and demand curves.</li> <li>• Find points of equilibrium.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.4, A-CED.1, A-CED.2, A-CED.3, A-CED.4, A-REI.1, A-REI.3, A-REI.11, F-IF.4, F-IF.7, F-IF.5, F-LE.2.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.</p>

## MODELING A BUSINESS (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M2.9-12.1</b></p>	<p><b>Fixed and Variable Expenses:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>Explain the difference between fixed and variable expenses.</li> </ul> <p>Create an expense equation based on fixed and variable expenses.</p>	<p><b><u>AKSS</u></b> A-SSE.4, A-CED.1. A-CED.2, A-CED.3. A-CED.4, A-REI.1. A-REI.3, F-IF.4.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.</p>
<p><b>M5.9-12.4</b></p>	<p><b>Graphs of Expense and Revenue Functions:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>Write, graph, and interpret the expense function.</li> <li>Write, graph, and interpret the revenue function.</li> <li>Identify the points of intersection of the expense and revenue functions.</li> <li>Identify breakeven points, and explain them in the context of the problem.</li> <li>Factor a quadratic using the method of completing the square.</li> </ul>	<p><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.1, A-CED.2. A-CED.3, A-CED.4. A-REI.1, A-REI.3. A-REI.11, F-IF.4. F-IF.7, F-LE.2, F-LE.1.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.</p>
<p><b>M5.9-12.1</b> <b>M5.9-12.2</b> <b>M5.9-12.3</b> <b>M5.9-12.4</b> <b>M5.9-12.5</b></p>	<p><b>Breakeven Analysis:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>Determine the breakeven prices and amounts using technology or algebra.</li> </ul>	<p><b><u>AKSS</u></b> A-SSE.1, A-SSE.4. A-CED.1, A-CED.2. A-CED.3, A-CED.4. A-REI.1, A-REI.11. F-IF.4, F-LE.2.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.</p>

## MODELING A BUSINESS (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M3.9-12.1</b> <b>M3.9-12.3</b></p>	<p><b>The Profit Equation:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Determine a profit equation given the expense and revenue equations.</li> <li>• Determine the maximum profit and the price at which that maximum is attained.</li> <li>• Determine complex roots of a quadratic equation.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>A-SSE.1, A-SSE.4. A-CED.2, A-CED.3. A-CED.4, A-REI.11. F-IF.4, F-LE.2, F-LE.1.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.</p>
<p><b>M1.9-12.1</b> <b>M1.9-12.2</b> <b>M2.9-12.1</b> <b>M3.9-12.1</b> <b>M3.9-12.3</b></p>	<p><b>Mathematically Modeling a Business:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Recognize the transitive property of dependence as it is used in a business model.</li> <li>• Use multiple sources of information, functions, and methodologies to model a new business.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>A-SSE.1, A-CED.3. A-CED.4.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Use appropriate tools strategically.</p>
<p><b>M3.9-12.1</b> <b>M3.9-12.3</b> <b>M7.9-12.5</b></p>	<p><b>Optimal Outcomes:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Use linear programming.</li> <li>• Write an objective function.</li> <li>• Construct a feasible region given constraints.</li> <li>• Maximize an objective profit function.</li> <li>• Minimize an objective expense function.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>A-SSE.4, A-CED.1. A-CED.2, A-CED.3. A-CED.4, A-REI.1. A-REI.3, A-REI.11. F-IF.5, F-LE.2.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Use appropriate tools strategically.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Guest speaker: Pagoda restaurant or Santa Claus House</li> </ul>	

## PLANNING FOR RETIREMENT

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<b>M1.9-12.1</b> <b>M1.9-12.2</b>	<b>Retirement Income from Savings:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>• Calculate the future values of retirement investments that are both single deposit and periodic.</li> <li>• Compare the tax savings by making contributions to pre-tax retirement savings accounts.</li> <li>• Calculate an employer’s matching contribution to a retirement account.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> A-SSE.1, A-SSE.4. A-CED.2, A-CED.3. A-CED.4, F-IF.4.  <b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Use appropriate tools strategically.
<b>M1.9-12.2</b>	<b>Social Security Benefits:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>• Understand the benefits paid by Social Security.</li> <li>• Understand how benefits are computed.</li> <li>• Compute federal income tax on benefits that are paid under Social Security.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> A-SSE.1, A-SSE.4. A-CED.2, A-CED.4.  <b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.
<b>M1.9-12.1</b> <b>M1.9-12.2</b>	<b>Pensions:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>• Calculate pension benefits using various formulas.</li> <li>• Calculate pension benefits during and after vesting periods.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> A-SSE.1, A-CED.2. A-CED.3, A-CED.4. F-IF.4.  <b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.
<b>M1.9-12.2</b>	<b>Life Insurance:</b> <u>Must be Covered:</u> The learner will: <ul style="list-style-type: none"> <li>• Compute the cost of different types of life insurance.</li> <li>• State the advantages and disadvantages of different types of life insurance.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> A-SSE.1, A-CED.1. A-CED.4, A-REI.1.  <b><u>Mathematical Practices</u></b> Use appropriate tools strategically.

## PLANNING FOR RETIREMENT

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M7.9-12.1</b>  <b>M7.9-12.2</b>  <b>M7.9-12.3</b></p>	<p><b>Investment Diversification:</b>  <b>Must be Covered:</b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Compare different types of investments that were covered throughout the previous nine units.</li> </ul>	<p style="text-align: center;"><u><b>AKSS</b></u>                      A-CED.4.</p> <p><u><b>Mathematical Practices</b></u>                      Make sense of problems and persevere in solving them.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<p>Bring in a speaker from the local funeral home to talk about the cost of a western civilization funeral, and bring in someone to talk about the cost for an Alaska Native wake.</p>	

## PREPARE A BUDGET

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b> <b>M2.9-12.1</b></p>	<p><b>Utility Expenses:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Compute the cost of electricity, gas, oil, and water for the home.</li> <li>• Compute the cost of using specific appliances for specific lengths of time.</li> <li>• Compute the time it takes an energy-saving appliance to pay for itself.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>A-SSE.1, A-SSE.4. A-CED.1, A-CED.2. A-CED.3, A-CED.4. A-REI.1, A-REI.3.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision.</p>
<p><b>M1.9-12.2</b></p>	<p><b>Electronic Utilities:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Compute the cost of cell phone calls, text messaging, Internet service, and cable television.</li> <li>• Compare different plans for these services.</li> <li>• Set up, graph, and interpret an average cost function.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>A-SSE.1, A-SSE.4. A-CED.1, A-CED.2. A-CED.3, A-CED.4. A-REI.1, A-REI.3. A-REI.10, F-IF.4. F-IF.6, F-IF.7, F-LE.2. F-LE.1.</p> <p><b><u>Mathematical Practices</u></b> Make sense of problems and persevere in solving them. Attend to precision. Use appropriate tools strategically.</p>
<p><b>M1.9-12.2</b> <b>M2.9-12.1</b> <b>M5.9-12.4</b></p>	<p><b>Charting a Budget:</b> <b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Create and use a budget check-off chart.</li> <li>• Visualize and interpret a budget using a circle graph, a bar graph, a line graph, and a budget line graph.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p>A-SSE.1, A-CED.4. A-REI.3, A-REI.10. F-IF.4, F-IF.5, F-IF.7. F-LE.2.</p> <p><b><u>Mathematical Practices</u></b> Use appropriate tools strategically.</p>

## PREPARE A BUDGET (continued)

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.2</b>  <b>M3.9-12.3</b>  <b>M3.9-12.2</b>  <b>M5.9-12.4</b></p>	<p><b>Cash Flow and Budgeting:</b>  <u>Must be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Develop and interpret a cash flow chart.</li> <li>• Develop and interpret a frequency budget plan.</li> <li>• Develop and interpret a yearlong expense budget plan.</li> </ul>	<p><u><b>AKSS</b></u>                      A-SSE.1, A-CED.1.                      A-CED.4, A-REI.1.                      F-IF.4, F-LE.2.</p> <p><u><b>Mathematical Practices</b></u>                      Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Use appropriate tools strategically.</p>
<p><b>M1.9-12.2</b>  <b>M3.9-12.3</b>  <b>M3.9-12.2</b>  <b>M5.9-12.4</b>  <b>M5.9-12.5</b></p>	<p><b>Budget Matrices:</b>  <u>Must be Covered:</u>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Determine the dimension of a matrix.</li> <li>• Add, subtract, and multiply matrices.</li> <li>• Multiply a matrix by a scalar.</li> </ul>	<p><u><b>AKSS</b></u>                      A-SSE.1, A-CED.2.                      A-CED.3, A-CED.4.                      F-IF.4, F-LE.2.</p> <p><u><b>Mathematical Practices</b></u>                      Reason abstractly and Quantitatively. Attend to precision. Use appropriate tools strategically.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Next Gen Personal Finance (NGPF) budgeting activities: <a href="https://www.ngpf.org/curriculum/budgeting/activities">https://www.ngpf.org/curriculum/budgeting/activities</a></li> <li>• MoneyInstructor.com budgeting planning and budgeting lessons: <a href="https://www.moneyinstructor.com/budgeting.asp">https://www.moneyinstructor.com/budgeting.asp</a></li> </ul>	

# Computer Programming

<p><b>Grade(s):</b> 9-12  <b>Length:</b> two semesters  <b>Credit:</b> 1 (0.5 per semester)  <b>Prerequisite:</b> <i>Algebra 1</i>, concurrent enrollment in <i>Algebra 1</i>, or teacher recommendation</p>	<p><b>Overview:</b>  <i>Computer Programming</i> is a course designed to introduce basic programming concepts. Students will master concepts including integer arithmetic, basic sorts and searches, and use of data structures. Concepts of object-oriented programming and algorithm design within the syntax of a higher-level language will be introduced.</p>
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Mathematical Topics (Recommended Order)	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• Overview of Computing</li> <li>• Data and Expressions</li> <li>• Using Classes and Objects</li> <li>• Conditionals and Loops</li> </ul>	<ul style="list-style-type: none"> <li>• Writing Classes</li> <li>• Building on Conditional and Loops</li> <li>• Object Oriented Design</li> <li>• Arrays</li> </ul>

Course/ Grade Competencies	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> </ul>

## OVERVIEW OF COMPUTING

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M6.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Computer Processing</li> <li>• Hardware Components</li> <li>• Programming Language</li> <li>• Program Development</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## DATA & EXPRESSIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Character Strings</li> <li>• Variables and assignment</li> <li>• Primitive data types</li> <li>• Expressions</li> <li>• Data conversion</li> <li>• Interactive programs</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## USING CLASSES & OBJECTS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Creating objects</li> <li>• The String Class</li> <li>• Packages</li> <li>• Enumerated types</li> <li>• Wrapper classes</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## CONDITIONALS & LOOPS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Boolean expressions</li> <li>• The if statement</li> <li>• Comparing data</li> <li>• The while statement</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## WRITING CLASSES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<b>M1.9-12.1</b> <b>M1.9-12.2</b> <b>M2.9-12.1</b> <b>M3.9-12.1</b> <b>M3.9-12.2</b> <b>M5.9-12.1</b> <b>M5.9-12.2</b> <b>M5.9-12.3</b>	<p><b><u>Must be Covered:</u></b>                      The learner will about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Classes &amp; objects revisited</li> <li>• Anatomy of a class</li> <li>• Encapsulation</li> <li>• Anatomy of a method</li> <li>• Constructors</li> </ul>	<p><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>		

## BUILDING ON CONDITIONAL & LOOPS

**Graduate-Level Competency:**

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<b>M2.9-12.1</b> <b>M3.9-12.1</b> <b>M3.9-12.2</b> <b>M5.9-12.1</b>	<p><b><u>Must be Covered:</u></b>                      The learner will about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• The switch statement</li> <li>• The Conditional Operator</li> <li>• The do statement</li> <li>• The for statement</li> </ul>	<p><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>		

## OBJECT ORIENTED DESIGN

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Identifying classes and objects</li> <li>• Static class members</li> <li>• Class relationships</li> <li>• Interfaces</li> <li>• Enumerated types revisited</li> <li>• Method design</li> <li>• Method overloading</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>		

## ARRAYS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will about and understand the following topics:</p> <ul style="list-style-type: none"> <li>• Array elements</li> <li>• Declaring &amp; using arrays</li> <li>• Arrays of objects</li> <li>• Command-line arguments</li> <li>• Two-dimensional arrays</li> </ul>	<p><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

# Geometry & Honors

<p><b>Grade(s):</b> 9-12  <b>Length:</b> two semesters  <b>Credit:</b> 1 (0.5 per semester)  <b>Prerequisite:</b> <i>Algebra 1</i> or teacher recommendation</p>	<p><b>Overview:</b>  The fundamental purpose of the course in Geometry is to formalize and extend students’ geometric experiences using more precise definitions and developing careful proofs. In Geometry, students take the basic distance and angle-preserving properties of rigid motions and similarity transformations as axiomatic, establish triangle congruence, and similarity criteria, then use them to prove a wide variety of theorems and solve problems involving, for example, triangles, other polygons, and circles.</p> <p>Students study geometric measurement and solve problems involving length, area and volume, learning more sophisticated arguments for the circumference, area, and volume formulas that they learned in earlier grades. They use similarity of right triangles with given angle measures to define sine, cosine, and tangent in terms of side ratios. They prove theorems and solve problems about circles, segments, angles, and arcs.</p> <p>Throughout the course, students use coordinates to connect geometry with algebra, and engage in mathematical modeling using geometric principles.</p> <p><b>Geometry Honors:</b>  Students will master all of the topics from <i>Geometry</i> listed above, with a variety of additional topics. These additional topics (content objectives) are documented within each unit in <b>RED</b> under the “can be covered” section.</p>
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Mathematical Topics (Recommended Order)	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• Constructions</li> <li>• Rigid Transformations</li> <li>• Congruence</li> <li>• Similarity</li> </ul>	<ul style="list-style-type: none"> <li>• Right Triangle Trigonometry</li> <li>• Solid Geometry</li> <li>• Coordinate Geometry</li> <li>• Circles</li> </ul>

Course/ Grade Competencies	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M6.9-12.1:</b> The learner will apply geometric theorems and postulates to solve problems, create arguments, and support their reasoning.</li> <li>• <b>M6.9-12.2:</b> The learner will use geometric theorems and postulates to construct and apply viable arguments.</li> <li>• <b>M6.9-12.3:</b> The learner will create and use a formal geometric construction, using appropriate tools, to illustrate geometric properties.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M4.9-12.1:</b> The learner will provide rationale for solving measurement problems that require making conversions among various units and measurement systems, or applying the effect of a scale factor.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M6.9-12.1:</b> The learner will apply geometric theorems and postulates to solve problems, create arguments, and support their reasoning.</li> <li>• <b>M6.9-12.2:</b> The learner will use geometric theorems and postulates to construct and apply viable arguments.</li> <li>• <b>M6.9-12.3:</b> The learner will create and use a formal geometric construction, using appropriate tools, to illustrate geometric properties.</li> </ul>

## CONSTRUCTIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M3.9-12.3</b>  <b>M6.9-12.1</b>  <b>M6.9-12.2</b>  <b>M6.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Know and be able to use precise definitions of geometric terms.</li> <li>• Make formal geometric constructions.</li> <li>• Construct an equilateral triangle, a square, an angle bisector, and a perpendicular bisector.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• <b>Construct a regular polygon.</b></li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-CO.1, G-CO.12,                      G-CO.13</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>		

## RIGID TRANSFORMATIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M3.9-12.3</b>  <b>M6.9-12.1</b>  <b>M6.9-12.2</b>  <b>M6.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Develop and apply precise definitions for translations, reflections, and rotations.</li> <li>• Describe rigid motions that take one figure onto another.</li> <li>• Prove angles of a triangle add up to 180 degrees.</li> <li>• Construct and apply a sequence of rigid motions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-CO.2, G-CO.3,                      G-CO.4, G-CO.5</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>		

## CONGRUENCE

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M3.9-12.3</b>  <b>M6.9-12.1</b>  <b>M6.9-12.2</b>  <b>M6.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Specify sequences of rigid motion that will carry a figure onto another.</li> <li>• Understand that there can be more than one sequence of rigid motion that carries a figure onto another figure.</li> <li>• Use the definition of congruence in terms of rigid motion to decide if two figures are congruent.</li> <li>• Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.</li> <li>• Be able to explain how the criteria for triangle congruence (ASA, SAS, SSS) follow from the definition of congruence in terms of rigid motion.</li> <li>• Prove theorems about triangles, lines, angles, and parallelograms.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Prove congruence for quadrilaterals.</li> <li>• Develop an understanding of AAS triangle congruence.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-CO.6, G-CO.7,                      G-CO.8, G-SRT.4</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## SIMILARITY

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M6.9-12.1</b>  <b>M6.9-12.2</b>  <b>M6.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Understand dilations, using center and scale factor to describe them.</li> <li>• Use the definition of similarity to decide if two figures are similar.</li> <li>• Use the properties of similarity to understand the Angle Similarity Theorem.</li> <li>• Prove why triangles are similar.</li> <li>• Prove why all circles are similar.</li> <li>• Find unknown side lengths of similar triangles.</li> <li>• Apply similarity to quadrilaterals.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Understand Side Side Side and Side Angle Side Triangle Similarity Theorem.</li> <li>• Prove the Law of Sines and Cosines and use them to solve problems.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-SRT.1, G-SRT.2,                      G-SRT.3, G-SRT.4,                      G-SRT.5, G-C.1</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## RIGHT TRIANGLE TRIGONOMETRY

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M4.9-12.1</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M6.9-12.1</b>  <b>M6.9-12.2</b>  <b>M6.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Using similarity, show that side ratios in right triangles are properties of angles.</li> <li>• Define the trigonometric ratios (sin, cos, tan) for acute angles.</li> <li>• Explain and use the relationship between sine and cosine of complementary angles.</li> <li>• Use trigonometric ratios to solve a variety of modeling problems.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Understand relationships in special right triangles (30-60-90 &amp; 45-45-90 triangles).</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-SRT.6, G-SRT.7,                      G-SRT.8</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## SOLID GEOMETRY

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

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**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M4.9-12.1</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M6.9-12.1</b>  <b>M6.9-12.2</b>  <b>M6.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Identify the shapes of two-dimensional cross-sections of three-dimensional objects and 3D objects from rotation of 2D shapes.</li> <li>• Understand the effects of dilation on area and volume.</li> <li>• Derive volume formulas using dissections and Cavalieri’s Principle.</li> <li>• Apply volume formulas to solve problems involving surface area to volume ratios and density.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• <b>Informally prove the formula for the volume of a sphere using Cavalieri’s principle.</b></li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-GMD.1, G-GMD.3,                      G-GMD.4</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## COORDINATE GEOMETRY

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M4.9-12.1</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M6.9-12.1</b>  <b>M6.9-12.2</b>  <b>M6.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Describe functions as transformations using coordinate transformation notation.</li> <li>• Describe transformations in the coordinate plane.</li> <li>• Derive equations for circles using definition of a circle.</li> <li>• Derive equations for parabolas using focus and directrix.</li> <li>• Understand the relationship between an equation and the graph, especially for linear and quadratic equations.</li> <li>• Understand slopes of parallel and perpendicular lines in a coordinate plane.</li> <li>• Use coordinates to make conjectures and prove geometric theorems algebraically.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• <b>Derive the formula for an ellipse and hyperbolas.</b></li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-GPE.1, G-GPE.2,                      G-GPE.4, G-GPE.5</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b>                      All mathematical practices                      are present in each unit.</p>
<p><b>Suggested Activities,                      Materials, and Resources:</b></p>		

## CIRCLES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

**M6 - Geometry:** The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.3</b>  <b>M4.9-12.1</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b>  <b>M5.9-12.3</b>  <b>M6.9-12.1</b>  <b>M6.9-12.2</b>  <b>M6.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Use the Pythagorean Theorem to derive an equation for a circle given center and radius.</li> <li>• Use similarity to derive the length of the arc of the circle.</li> <li>• Derive a formula for the area of sector.</li> <li>• Describe the relationship between central and inscribed angles and their arcs.</li> <li>• Describe relationships and ratios of lengths of intersecting chords.</li> <li>• Use relationships about inscribed angles to solve problems about inscribed polygons.</li> <li>• Solve problems involving properties of circles.</li> <li>• Prove properties of angles of inscribed polygons.</li> <li>• Proves that a radius and a tangent to a circle at the same point are perpendicular.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• <b>Prove that an inscribed angle that subtends a diameter is a right angle.</b></li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-C.2, G-C.3,                      G-C.5, G-GPE.1</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

# Math for the Trades & Technical Careers

<p><b>Grade(s):</b> 9-12  <b>Length:</b> two semesters  <b>Credit:</b> 1 (0.5 per semester)  <b>Prerequisite:</b> none</p>	<p><b>Overview:</b>  <i>Math for Trades &amp; Technical Careers</i> emphasizes the advanced and applied algebraic topics needed for success in industry-based occupations. The course is designed to introduce students to the mathematics used in various trades and apprenticeship programs through a focus on the practical application of mathematics.</p> <p>Students are expected to master skills without the use of a calculator, in addition to working with applied problems using manipulatives, calculators, spreadsheets, application software, and specialized technologies. There will be a review of the real number system, fractions, measuring tools, unit conversions, ratios, proportions, percent, plane and solid geometry, systems of equations, trigonometry, and vectors.</p> <p>All concepts are applied to industry situations with the goal and focus of preparing for industry entrance exams.</p>
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<b>Mathematical Topics</b> (Recommended Order)	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• Numeration</li> <li>• Measurement</li> <li>• Geometry and Unit Analysis</li> <li>• Formulas and Equations</li> </ul>	<ul style="list-style-type: none"> <li>• Ratios and Slope</li> <li>• Apply and Interpret Functions</li> <li>• Vectors</li> </ul>

Course/ Grade Competencies	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M3.9-12.3:</b> The learner will compare the effectiveness or logic of two plausible arguments or models.</li> <li>• <b>M4.9-12.1:</b> The learner will provide rationale for solving measurement problems that require making conversions among various units and measurement systems, or applying the effect of a scale factor.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M4.9-12.1:</b> The learner will provide rationale for solving measurement problems that require making conversions among various units and measurement systems, or applying the effect of a scale factor.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M7.9-12.1:</b> The learner will formulate questions to clarify the problem at hand and formulate one (or more) questions that can be answered with data.</li> <li>• <b>M7.9-12.2:</b> The learner will design and implement a plan to collect the appropriate data to answer the statistical question.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> <li>• <b>M7.9-12.5:</b> The learner will interpret descriptive statistics and linear models within the context of the data and the original question.</li> <li>• <b>M7.9-12.6:</b> The learner will apply probability concepts to analyze and evaluate potential decisions and strategies.</li> </ul>

## NUMERATION

**Graduate-Level Competency:**

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M2.9-12.1</b> <b>M4.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Apply rational numbers to common trade situations.</li> <li>• Express rational numbers as common fractions and mixed fractions.</li> <li>• Evaluate operations with rational numbers in applied situations.</li> <li>• Convert between ratios, decimals, and percents</li> </ul> <p><b><u>Can be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Learn about and understand binary, octal, and hexadecimal numbers.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Make a daily goal to practice Work Keys questions so students interested in the trade unions may score well on the math portion of this test.</li> </ul>	

## MEASUREMENT

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M1.9-12.2</b> <b>M4.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Reason quantitatively and use units to solve problems.</li> <li>• Use metric and U.S. systems of measurement.</li> <li>• Use precision when necessary and estimate when necessary.</li> <li>• Use industry related scales.</li> <li>• Use measuring tapes (regular/landscaper’s), speed squares, carpenter’s squares, vernier caliper, micrometers</li> <li>• Differentiate the terms “level”, “square”, “plum”</li> <li>• Measure in one, two, and three dimensions</li> <li>• Measure angles in degrees using industry-appropriate tools</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> N-Q.1, N-Q.2, N-Q.3</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## GEOMETRY & UNIT ANALYSIS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M4.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Determine area &amp; perimeter of rectangular, triangular, and circular floor layouts.</li> <li>• Determine volume of right rectangular prisms to find common trade volumes.</li> <li>• Use dimensional analysis to convert units in one, two, and three dimensions.</li> <li>• Use dimensional analysis to convert rates involving one, two, and three dimensions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      N-Q.1, N-Q.2,                      N-Q.3</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

## FORMULAS & EQUATIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Create and solve equations that describe numbers or relationships.</li> <li>• Simplify, then solve equations.</li> <li>• Solve equations with variables on both sides.</li> <li>• Solve any linear equation.</li> <li>• Write and solve equations to model situations.</li> <li>• Apply the Pythagorean theorem and the converse of the Pythagorean theorem.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b></p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Use the converse of the Pythagorean theorem to create a 20 by 30 rectangle with tape on the floor.</li> </ul>	

## RATIO & SLOPE

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Create unit rates to perform quick calculations in applied problems.</li> <li>• Use proportions to perform any one-step unit conversion.</li> <li>• Use proportions to read/ create scale drawings.</li> <li>• Graph lines in slope-intercept form.</li> <li>• Find the slope of physical objects</li> <li>• Cite industry standards slopes for roofs, plumbing, and stairs.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      S-CP.3, S-CP.2,                      S-CP.1, S-ID.4,                      S-ID.3, S-ID.2</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Hang an ABS pipe at industry standard minimum slope.</li> </ul>	

## APPLY & INTERPRET FUNCTIONS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b>  <b>M1.9-12.2</b>  <b>M2.9-12.1</b>  <b>M3.9-12.1</b>  <b>M3.9-12.2</b>  <b>M3.9-12.3</b>  <b>M5.9-12.1</b>  <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Understand similarity in terms of similarity transformations.</li> <li>• Define trigonometric ratios and solve problems involving right triangles.</li> <li>• Extend the domain of trigonometric functions using the unit circle.</li> <li>• Apply the law of sines &amp; law of cosines to find angles in a truss.</li> </ul> <p><b><u>Can be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Use identities from the unit circle to perform quick calculations.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-SRT.2, G-SRT.6,                      G-SRT.7, G-SRT.8,                      F-TF.1, F-TF.2,                      F-TF.3, G-GMD.1,                      G-GMD.2, G-GMD.3,                      G-MG.2, G-MG.3,                      G-GPE.7</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b>                      All mathematical practices                      are present in each unit.</p>
<p><b>Suggested Activities,                      Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• Make clinometers to find heights of tall objects outside or in school.</li> </ul>	

## VECTORS

**Graduate-Level Competency:**

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M5.9-12.1</b> <b>M5.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Represent and model with vector quantities.</li> <li>• Calculate exponents, roots, and rational exponents.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> N-VM.1, N-VM.2, N-VM.4, N-VM.5</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>		

# Pre-Calculus

<p><b>Grade(s):</b> 10-12  <b>Length:</b> two semesters  <b>Credit:</b> 1 (0.5 per semester)  <b>Prerequisite:</b> <i>Geometry</i> and <i>Algebra 2</i> or teacher recommendation</p>	<p><b>Overview:</b>  <i>Pre-Calculus</i> is the preparation for Calculus. The course approaches topics from a function point of view, where appropriate, and is designed to strengthen and enhance conceptual understanding and mathematical reasoning used when modeling and solving mathematical and real-world problems. Students will be provided with a rigorous algebraic study of rational, polynomial, exponential and logarithmic functions, radians, degrees, DMS, graphing trigonometric functions, trigonometric identities, and other coordinate systems.</p>
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Mathematical Topics (Recommended Order)	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• Functions</li> <li>• Polynomials</li> <li>• Rational Functions</li> <li>• Exponential and Logarithmic Relationships</li> <li>• Sequences and Series</li> </ul>	<ul style="list-style-type: none"> <li>• Unit Circle and Right/ Non-Right Triangle Trigonometry</li> <li>• Graphs of Trigonometric Functions</li> <li>• Trigonometric Identities</li> <li>• Other Coordinate Systems</li> </ul> <p>Other topics, if time allows:</p> <ul style="list-style-type: none"> <li>• Conditional Probability</li> </ul>

Course/ Grade Competencies	
Semester 1	Semester 2
<ul style="list-style-type: none"> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.M5.9-12.1</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> <li>• <b>M5.9-12.5:</b> The learner will identify, build, and perform operations on relations and functions and justify their reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>M1.9-12.1:</b> The learner will write, apply, and provide a rationale for a mathematical model representing a given situation.</li> <li>• <b>M1.9-12.2:</b> The learner will interpret and use symbols to express relationships and justify reasoning when solving problems.</li> <li>• <b>M2.9-12.1:</b> The learner will justify how to apply properties of real number systems to variable expressions in a variety of contexts.</li> <li>• <b>M3.9-12.1:</b> The learner will use computational strategies and algorithms and provide rationale for their use.</li> <li>• <b>M3.9-12.2:</b> The learner will reason quantitatively when analyzing, representing, and solving problems.</li> <li>• <b>M4.9-12.1:</b> The learner will provide rationale for solving measurement problems that require making conversions among various units and measurement systems, or applying the effect of a scale factor.</li> <li>• <b>M5.9-12.1:</b> The learner will apply properties of arithmetic and algebra to simplify and manipulate symbolic expressions or models.</li> <li>• <b>M5.9-12.2:</b> The learner will write and apply algebraic modes to represent and answer questions about a given situation.</li> <li>• <b>M5.9-12.3:</b> The learner will interpret, analyze, and use relations and functions applied in a variety of contexts, including real-world phenomena.</li> <li>• <b>M5.9-12.4:</b> The learner will analyze relations and functions, using multiple representations.</li> <li>• <b>M5.9-12.5:</b> The learner will identify, build, and perform operations on relations and functions and justify their reasoning.</li> <li>• <b>M7.9-12.3:</b> The learner will summarize data using appropriate statistics.</li> <li>• <b>M7.9-12.4:</b> The learner will select appropriate graphical and numerical methods, and use these methods to represent the data in a way that supports interpretation.</li> <li>• <b>M7.9-12.6:</b> The learner will apply probability concepts to analyze and evaluate potential decisions and strategies.</li> </ul>

## FUNCTIONS

**Graduate-Level Competency:**

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M5.9-12.1</b> <b>M5.9-12.5</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Perform operations with functions:               <ul style="list-style-type: none"> <li>○ Add</li> <li>○ Subtract</li> <li>○ Composition.</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-BF.1</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M5.9-12.3</b> <b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Find inverses of functions:               <ul style="list-style-type: none"> <li>○ To include domain restriction when needed.</li> </ul> </li> <li>• Verify inverses through composition.</li> <li>• Use a graph or table to find values of an inverse.</li> <li>• Use the inverse relationship between exponentials and logarithms to solve problems.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-BF.4a, F-BF.4b, F-BF.4c, F.BF.4d, F-BF.5</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 2</li> </ul>	

## POLYNOMIALS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

Course/ Grade Competency	Content Objectives	Standards
<b>M3.9-12.1</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Use long and/or synthetic division to factor polynomials of degree three or higher.</li> <li>• Use algebraic methods to find all real and imaginary zeros of polynomials degree three or higher.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-APR.1, N-CN.9</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>M1.9-12.2</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Graph polynomials of degree three or higher and identify key features:               <ul style="list-style-type: none"> <li>○ Intercepts, increasing/decreasing intervals, positive/negative intervals, end behavior, relative max/min.</li> </ul> </li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-IF.4</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 3</li> </ul>	

## RATIONAL FUNCTIONS

### Graduate-Level Competency:

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<b>M5.9-12.4</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Graph functions and show key features:                             <ul style="list-style-type: none"> <li>○ Linear</li> <li>○ Quadratic</li> <li>○ Square and cube root</li> <li>○ Piecewise to include step and absolute value</li> <li>○ Polynomial functions</li> <li>○ Rational functions</li> <li>○ Exponential functions</li> <li>○ Logarithmic functions.</li> </ul> </li> <li>• Find domain and range of a function.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-IF.7a, F-IF.7b, F-IF.7c, F-IF.7d, F-IF.7e, F-IF.5</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 3</li> </ul>	

## EXPONENTIAL & LOGARITHMIC RELATIONSHIPS

### Graduate-Level Competency:

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

Course/ Grade Competency	Content Objectives	Standards
<b>M3.9-12.1</b> <b>M3.9-12.2</b>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Use properties of logarithms to simplify and expand logarithms.</li> <li>• Use a variety of algebraic methods to solve logarithmic and exponential equations; include restrictions in the solutions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-IF.5</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 4</li> </ul>	

## SEQUENCES & SERIES

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M5.9-12.1</b> <b>M5.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Write arithmetic sequences recursively.</li> <li>• Write arithmetic sequences explicitly.</li> <li>• Write geometric sequences recursively.</li> <li>• Write geometric sequences explicitly.</li> <li>• Model situation with sequences.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F.BF.2</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M1.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Use summation notation to write finite and infinite series</li> <li>• Use summation notation to evaluate finite and infinite series</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> A-SSE.4</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 12</li> </ul>	

## UNIT CIRCLE & RIGHT/ NON-RIGHT TRIANGLE TRIGONOMETRY

### Graduate-Level Competency:

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

**M4 - Measurement:** The learner will explain reasoning when applying and modeling geometric principles.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<b>M3.9-12.2</b> <b>M4.9-12.1</b>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Solve right triangles using Pythagorean Theorem and trigonometry ratios.</li> <li>• Solve non-right triangles using Law of Sines and/or Law of Cosines (to include ambiguous case).</li> <li>• Convert between radians, degrees, and degree/minute/second.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      G-SRT.8, G-SRT.11,                      F-TF.1, N-Q.3</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<b>M5.9-12.1</b> <b>M5.9-12.2</b>	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Extend the domain of trig functions using the unit circle.</li> <li>• Evaluate all six trig functions for exact values.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      F-TF.2, F-TF.3</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
	<p><b><u>Must be Covered:</u></b>                      The learner will:</p> <ul style="list-style-type: none"> <li>• Use inverse trig functions to solve trigonometric equations.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b>                      F-TF.7</p> <p><b><u>Mathematical Practices</u></b>                      All mathematical practices are present in each unit.</p>
<b>Suggested Activities, Materials, and Resources:</b>	<ul style="list-style-type: none"> <li>• <i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 5, lesson 1-2 and chapter 6</li> </ul>	

## GRAPHS OF TRIGONOMETRIC FUNCTIONS

**Graduate-Level Competency:**

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M1.9-12.1</b> <b>M5.9-12.3</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>Graph the six trigonometric functions and their transformations.</li> <li>Graph the inverses of trigonometric functions.</li> <li>Model periodic phenomena with trigonometric functions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F.BF.3, F-TF.6, F-TF.5</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li><i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 5, lessons 3-6</li> </ul>	

## TRIGONOMETRIC IDENTITIES

**Graduate-Level Competency:**

**M3 – Reasoning and Strategic Thinking:** The learner will use evidence to support authentic application of concepts and support mathematical arguments.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M3.9-12.2</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>Prove and apply the three Pythagorean Identities .</li> <li>Prove and apply the addition and subtraction formulas.</li> <li>Prove and apply the double and half-angle identities.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-TF.8, F-TF.9</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M3.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>Use identities to solve trigonometric equations.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> F-TF.9</p> <p><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li><i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 7</li> </ul>	

## OTHER COORDINATE SYSTEMS

### Graduate-Level Competency:

**M1 – Symbolic Expression:** The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.

**M2 – Numbers and Number Systems:** The learner will develop an applied knowledge of numbers and number systems to solve problems.

**M5 – Algebraic Functions, Patterns and Relations:** The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M5.9-12.1</b> <b>M5.9-12.5</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Recognize vector quantities have both magnitude and direction.</li> <li>• Represent vectors with directed line segments.</li> <li>• Use appropriate symbols for vectors and their magnitudes .</li> <li>• Find the components of a vector.</li> <li>• Solve problems that can be represented by vectors.</li> <li>• Add and subtract vectors.</li> <li>• Multiply a vector by a scalar.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> N-VM.1, N-VM.2, N-VM.3, N-VM.4a, N-VM.4b, N-VM.4c, N-VM.5a, N-VM.5b</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M5.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Graph parametric functions with and without technology.</li> <li>• Graph ordered pairs in polar.</li> <li>• Graph polar functions.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> N-CN.4</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M1.9-12/2</b> <b>M2.9-12.1</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Represent complex numbers on the complex plane.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> N-CN.4</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 8 and chapter 9</li> </ul>	

## CONDITIONAL PROBABILITY (Optional, if time allows.)

**Graduate-Level Competency:**

**M7 – Data, Analysis, Probability, and Statistics:** The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
<p><b>M7.9-12.3</b> <b>M7.9-12.4</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Understand independence and conditional probability and use them to interpret data.               <ul style="list-style-type: none"> <li>○ Construct and interpret two way frequency tables.</li> </ul> </li> <li>• Use the rules of probability to compute probabilities of compound events in a uniform probability model.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> S.CP.1, S.CP.2, S.CP.3, S.CP.4, S.CP.5, S.CP.6, S.CP.7</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>M7.9-12.6</b></p>	<p><b><u>Must be Covered:</u></b> The learner will:</p> <ul style="list-style-type: none"> <li>• Use probability to evaluate outcomes of decisions.               <ul style="list-style-type: none"> <li>○ Making fair decisions.</li> </ul> </li> <li>• Analyzing decisions and strategies using probability concepts.</li> </ul>	<p style="text-align: center;"><b><u>AKSS</u></b> S.MD.6, S.MD.7</p> <p style="text-align: center;"><b><u>Mathematical Practices</u></b> All mathematical practices are present in each unit.</p>
<p><b>Suggested Activities, Materials, and Resources:</b></p>	<ul style="list-style-type: none"> <li>• <i>Precalculus: Mathematics for Calculus</i> (Cengage, 7<sup>th</sup> edition, 2016) – chapter 14</li> </ul>	



Fairbanks North Star Borough School District

The Fairbanks North Star Borough School District is an equal employment and educational opportunity institution, as well as a tobacco and nicotine-free learning and work environment.

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