West Linn–Wilsonville School District
Mathematics – Course Statement

Course Title: Advanced Algebra
Course Titles: Advanced Algebra (Part A) & Advanced Algebra (Part B)

Length of Course: Year; (2 years to complete Part A & Part B sequence)
Number of Credits: 1 each year
Grade Level: 9, 10, 11, 12
Prerequisites: Placement by previous math teacher or Geometry

Date of Description/Revision: 2013

Course Overview	

Advanced Algebra uses the language of Algebra to describe real world cause and effect relationships using linear and quadratic equations and inequalities, rational expressions, polynomials, exponential and logarithmic equations, systems of equations, conic sections and basic trigonometry. Students in this course will study these functions and will be able to represent them numerically, graphically and symbolically.

Advanced Algebra (Part A) and Advanced Algebra (Part B) together cover the same content as Advanced Algebra, except at a slower pace, requiring two years to complete instead of one.

Essential Questions	Concepts providing focus for student learning

- What mathematical models are used to describe any cause and effect relationship in our world?
- What are the different mathematical ways to record and analyze the models that describe these relationships?
- How do we communicate and use these algebraic models effectively, accurately and efficiently?

Proficiency Statements	

Upon completion of course, students will be able to:
- Convert numeric and geometric patterns to their symbolic and graphical representations.
- Communicate the numeric pattern given symbolic and graphical representations (advanced algebraic functions).
- Predict outcomes of given advanced algebraic functions and graphs.

Course Standards/Units	

Units	Includes Standards Clusters	Mathematical Practice Standards
Unit 1 Polynomial, Rational, and Radical Relationships	- Perform arithmetic operations with complex numbers. - Use complex numbers in polynomial identities and equations. - Interpret the structure of expressions. - Write expressions in equivalent forms to solve problems. - Perform arithmetic operations on	Make sense of problems

	polynomials. • Understand the relationship between zeros and factors of polynomials. • Use polynomial identities to solve problems. • Rewrite rational expressions. • Understand solving equations as a process of reasoning and explain the reasoning. • Represent and solve equations and inequalities graphically. • Analyze functions using different representations.	and persevere in solving them. Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others.
Unit 2 Modeling with Functions	• Create equations that describe numbers or relationships. • Interpret functions that arise in applications in terms of a context. • Analyze functions using different representations. • Build a function that models a relationship between two quantities. • Build new functions from existing functions. • Construct and compare linear, quadratic, and exponential models and solve problems.	Model with mathematics. Use appropriate tools strategically. Attend to precision
Unit 3 Inferences and Conclusions from Data	• Summarize, represent, interpret data on single count or measurement variable. • Understand and evaluate random processes underlying statistical experiments. • Make inferences and justify conclusions from sample surveys, experiments and observational studies. • Use probability to evaluate outcomes of decisions.	Look for make use of structure. Look for and express regularity in repeated reasoning.
Unit 4 Trigonometric Functions	• Extend the domain of trigonometric functions using the unit circle. • Model periodic phenomena with trigonometric functions. • Prove and apply trigonometric identities.	

Advanced Algebra (A) covers units 1 and 2 and Advanced Algebra (B) covers units 3 and 4.

Above table adapted from: National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common Core State Standards for Mathematics.* Washington, DC: Authors.

Resources

• Text: *Algebra 2,* Larson, Holt McDougal, 2011