

Course Description

A. COVER PAGE

<p>1. Course Title Geometry w/Advanced Algebra</p> <p>2. Transcript Title / Abbreviation Geometry w/Advanced Algebra</p> <p>3. Transcript Course Code / Number GEOadvAlg</p> <p>4. School Bay Area School of Independent Study (BASIS)</p> <p>5. District Sunol Glen</p> <p>6. City Newark</p> <p>7. School / District Web Site www.basischarter.org</p> <p>8. School Course List Contact Name: Leslie Nilson Title/Position: High School Administrator Phone: 510-687-9111 E-mail: founnilsons@aol.com</p>	<p>9. Subject Area</p> <p><input type="checkbox"/> History/Social Science</p> <p><input type="checkbox"/> English</p> <p><input checked="" type="checkbox"/> Mathematics</p> <p><input type="checkbox"/> Laboratory Science</p> <p><input type="checkbox"/> Language other than English</p> <p><input type="checkbox"/> Visual & Performing Arts</p> <p><input type="checkbox"/> College Prep Elective</p> <p>10. Grade Level(s) 11th</p> <p>11. Seeking "Honors" Distinction? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>12. Unit Value</p> <p><input type="checkbox"/> 0.5 (half year or semester equivalent)</p> <p><input checked="" type="checkbox"/> 1.0 (one year equivalent)</p> <p><input type="checkbox"/> 2.0 (two year equivalent)</p> <p><input type="checkbox"/> Other: _____</p>
<p>13. Was this course previously approved by UC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If yes, check all that apply:</p> <p><input type="checkbox"/> Course reinstated after removal within 3 years. Year removed from list? _____ Same course title? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, previous course title? _____</p> <p><input type="checkbox"/> Identical course approved at another school in same district. Which school? _____ Same course title? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, course title at other school? _____</p> <p><input type="checkbox"/> Alternative course title for course with identical content at this school Title of previously-approved identical course: _____</p> <p><input type="checkbox"/> Advanced Placement (AP) or International Baccalaureate (IB) course</p> <p><input type="checkbox"/> Approved UC College Prep (UCCP) Initiative course</p> <p><input type="checkbox"/> Approved P.A.S.S. course</p> <p><input type="checkbox"/> Approved ROP/C course. Name of ROP/C? _____</p> <p><input type="checkbox"/> Other. Explain: _____</p>	
<p>14. Is this course modeled after an UC-approved course from another school <u>outside</u> your district? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If so, which school(s)? _____</p>	

15. Pre-Requisites

A grade of C or better in Algebra 2 CP-S.

16. Co-Requisites

None

17. Brief Course Description

This course is the third in the series of Saxon textbook courses. The three courses are Algebra 1 CP-S, Algebra 2-S, and Geometry w/ Advanced Algebra and are to be taken consecutively.

The course is an integrated course based on the standards set by the State of California. The following topics are included: geometric proofs; Pythagorean theorem; constructions; trigonometric functions; special triangles; coordinate geometry; conic sections; statistics and probability.

B. COURSE CONTENT

Please refer to instructions

18. Course Goals and/or Major Student Outcomes

Coursework will include a thorough understanding and application of the following topics:

- Students write geometric proofs, including proofs by contradiction.
- Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.
- Students prove basic theorems involving congruence and similarity.
- Students compute the volumes and surface areas of spheres.
- Students prove the Pythagorean theorem.
- Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.
- Students perform basic constructions with a straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line.
- Students use coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles.
- Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use relationships between them.
- Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side.
- Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.
- Students know the effect of rigid motions on figures in the coordinate plane and space, including translations and reflections.
- Students solve systems of linear equations and inequalities (in two or three variables) simultaneously, by substitution, graphically, or with matrices.
- Students factor polynomials representing the sum and difference of two cubes.
- Students demonstrate knowledge of how real and complex numbers are related both arithmetically and graphically and can plot complex numbers as points in the plane.
- Students graph quadratic functions and determine the zeros of the function
- Students prove simple logarithms including understanding the inverse relationship between exponents and logarithms, and judging the validity of an argument based on whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step.
- Students know the laws of exponents, understand exponential functions, and use these functions in problems involving exponential growth and decay.
- Students use the definition of logarithms and the product formula for logs to translate between logarithms in any bases.
- Students understand and use the properties of logarithms to simplify logarithmic numeric expressions and identify their approximate values.
- Students demonstrate and explain how geometry of the graph of a conic section depends on the coefficients of the quadratic equation representing it.
- Given a quadratic equation, students can use the method of completing the square to put the equation into standard form and can recognize whether its graph is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.
- Students use fundamental counting principles to compute combinations and permutations.
- Students use combinations and permutations to compute probabilities.
- Students know the Binomial Theorem and use it to expand binomial expressions that are raised to positive integer powers.
- Students solve problems involving functional concepts such as composition, inverse, and arithmetic operations
- Students use a normal distribution table, percentile and z-scores, and box and whisker plots to evaluate data.
- Students use domain and range and tests to evaluate functions.

19. Course Objectives

After completing this course, students will have expanded their ability to solve equations and inequalities, factoring polynomials, graphs, and exponents, and solving quadratic equations. Students will further develop the ability to perform quadratic, logarithmic, and exponential functions. Finally, students will understand the real-world applications of algebra and geometry.

20. Course Outline

- Points, Lines, Planes, and Angles
 - Definitions and Postulates-Segments, Rays, Distance, and angles and Postulates and Theorems relating points, lines, and planes
- Deductive Reasoning
 - Using Deductive reasoning-If-then statements; Converses and Properties from Algebra and Proving theorems
 - Theorems about Angles and Perpendicular Lines-Special pairs of angles and Perpendicular lines and Planning a proof
- Quadrilaterals
 - Parallelograms
- Similar Polygons
 - Working with similar triangles
 - Proofs
- Right triangles
 - Pythagorean theorem
- Trigonometry
 - Inverse Trig. Functions
 - Reciprocal Trig. Functions
 - Graphs of Sine, Cosine, Tangent, and Cotangent
 - Trig. Equations
 - Law of Sines and Cosines
 - Trig Identities
 - De Moivre's Theorem
- Circles
 - Tangents, Arcs, and Chords
 - Radian measure
- Areas and volumes of solids
 - Spheres
- Sum and difference of 2 cubes
- Functions
 - Evaluating
 - Domain and Range
 - Tests for functions
- Exponents and Logarithms
 - Equations
 - Laws
 - Inverse functions
 - Common logs and natural logs
 - Antilogs
- Conic Sections
- Statistics and Probability
 - Binomial Expansion
 - Fundamental Counting Principle
 - Combinations and Permutations
 - Single variable analysis
 - Normal Distribution
 - Percentile and z-scores
 - Box and Whisker Plots
- Symmetry
 - Reflections
 - Translations
- Matrices and Determinants
 - Kramer's Rule

21. Texts & Supplemental Instructional Materials

Advanced Mathematics 2nd Edition*

Saxon, co. 2001

*Complete lessons 1-90 only.

22. Key Assignments

- Unit by Unit problem sets
- End of Chapter tests
- Finals required at mid-term and end of year

23. Instructional Methods and/or Strategies

Instruction may include the following:

- Lecture/Demonstration
- Discussion
- Text Reading and Practices
- Personal Tutoring
- CD Rom
- Internet Research

24. Assessment Methods and/or Tools

Assessment tools include the following, but are not limited to:

- Monthly review of student work by the Independent Study Teacher.
- Chapter and Unit tests and examinations.
- Student grades on text practices and standardized tests
- Written state examinations
- Oral communication with Independent Study Teacher.
- Final Examination

C. HONORS COURSES ONLY

Please refer to instructions

25. Indicate how this honors course is different from the standard course.

D. OPTIONAL BACKGROUND INFORMATION

Please refer to instructions

26. Context for Course (optional)

27. History of Course Development (optional)