COURSE TITLE	
Geometry	

DISTRICT COURSE NUMBER	4-DIGIT STATE COURSE CODE (COMPLETED BY SILT)
#0221	**2413**

Rationale:	Students successfully completing this course will have an extensive background in Geometry preparing them for college level or career technical coursework.
Course Description that will be in the Course Directory:	This course is designed for students bound for college or career technical training. Students will apply algebra as well as develop geometric concepts. Students will engage in an in-depth study of California's Common Core Standards for Mathematics. Topics include inductive and deductive reasoning, properties and proofs of parallel and perpendicular lines, properties and proofs of congruent triangles, relationships within triangles, properties of polygons and quadrilaterals, similar shapes and proportional reasoning, trigonometry, transformations, properties of circles, finding area and perimeter of triangles, various quadrilaterals, regular polygons and circles, and finding surface area and volume of prisms, pyramids, cones, cylinders and spheres.
How Does this Course align with or meet State and District content standards?	This course is aligned with the California Common Core Standards.

NCLB Core Subjects:

Select up to two that apply:

- [ ] Arts
- [ ] Economics
- [ ] English
- [ ] Foreign Language
- [ ] Geography
- [ ] Civics and Government
- [ ] History
- [x] Mathematics
- [ ] Reading / Language Arts
- [ ] Science
- [ ] Not Core Subject

CDE CALPADS Course Descriptors:

(See Page 2 for Definitions)

CTE TECH PREP COURSE INDICATORS	CTE COURSE CONTENT CODE	INSTRUCTIONAL LEVEL CODE
[ ] Tech Prep (32) (Higher Ed)	[ ] CTE Introductory (01)	[ ] Remedial (35)
[ ] Tech Prep & ROP(33) (Higher Ed)	[ ] CTE Concentrator (02)	[ ] Honors UC-Certified (39)
[ ] ROP (30)	[ ] CTE Completer (03)	[ ] Honors Non UC-Certified (34)
[x] N/A	[ ] Voc Subject _____	[ ] College (40)
	[x] N/A	[x] N/A

Length of Course:	[x] Year [ ] Semester
Grade Level(s):	[x] 9 [x] 10 [x] 11 [x] 12
Credit:	[x] Number of credits: **10** [x] Meets graduation requirements (subject **Mathematics**) [ ] Request for UC "a–g" requirements CSU/UC requirement _____ [x] College Prep
Prerequisites:	C or better in Algebra I or teacher recommendation
Department(s):	Mathematics
District Sites:	EDHS, ORHS, PHS, UMHS, IHS, MVHS, Virtual Academy
Board of Trustees COS Adoption Date:	5/14/2013

Textbooks / Instructional Materials:	**Geometry** (Common Core), Randall I. Charles, Ph.D., Dan Kennedy, Ph. D., & Basia Hall, Pearson Publishing, Copyright: 2013, ISBN: 978-0-13-318583-6
Funding Source:	General Fund
Board of Trustees Textbook Adoption Date:	5/14/2013

Definitions

CALPADS	California Longitudinal Pupil Achievement Data System
CTE Technical Prep	A course within a CTE technical career pathway or program that has been articulated with a postsecondary education or through an apprenticeship program of at least 2 years following secondary instruction.
Instructional Level Code	Represents a nonstandard instructional level at which the content of a specific course is either above or below a 'standard' course instructional level. These levels may be identified by the actual level of instruction or identified by equating the course content and level of instruction with a state or nationally recognized advanced course of study, such as IB or AP.
Instructional Level Honors, UC Certified	Includes all AP courses.
Instructional Level Honors, non UC Certified	Requires Board approval.
Instructional Level College	Includes ACE courses. Equivalent to college course and content, but not an AP course. Not related to section, but to course.

EL DORADO UNION HIGH SCHOOL DISTRICT

EDUCATIONAL SERVICES

Course Title: Geometry **#0221**

TABLE OF CONTENTS

EDUCATIONAL SERVICES

Department: **Mathematics**

Course Title: **Geometry**   Course Number: **#0221**

Unit Title: **Congruence**

Content Area Standards (Please identify the source): List content standards students will master in this unit.
• Experiment with transformations in the plane
• Understand congruence in terms of rigid motions
• Prove geometric theorems
• Make geometric constructions

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Experiment with transformations in the plane

G-CO 1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line,distance along a line, and distance around a circular arc.

G-CO 2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).

G-CO 3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

G-CO 4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

G-CO 5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

Understand congruence in terms of rigid motions

G-CO 6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.

G-CO 7. 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.

G-CO 8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

Prove geometric theorems

G-CO 9. Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.

G-CO 10. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel

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to the third side and half the length; the medians of a triangle meet at a point.

G-CO 11. Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

Make geometric constructions

G-CO 12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

G-CO 13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

Teachers will use a variety of instructional strategies that may include, direct instruction utilizing Smart Notebook, investigative approaches using measurement tools and manipulatives, and simulations or demonstrations with graphing calculators and mathematical software.

Students may take notes in pre-printed notepackets or workbooks.

Teachers will guide practice as students work independently, collaboratively in pairs or in groups to discover, investigate, practice and apply the concepts of the course to a mastery level. Smart Responders will be used to assess and adjust student progress.

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

Formative assessments will include warm-ups, classwork, homework, individual and collaborative quizzes, investigative activities and multi-step performance tasks.

Summative assessments will include unit tests, semester finals and culminating projects that simulate and apply the common core standards.

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

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EDUCATIONAL SERVICES

Department: **Mathematics**

Course Title: **Geometry**   Course Number: **#0221**

Unit Title: **Similarity, Right Triangles, and Trigonometry**

Content Area Standards (Please identify the source): List content standards students will master in this unit.
• Understand similarity in terms of similarity transformations
• Prove theorems involving similarity
• Define trigonometric ratios and solve problems involving right triangles
• Apply trigonometry to general triangles

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Understand similarity in terms of similarity transformations

G-SRT 1. Verify experimentally the properties of dilations given by a center and a scale factor:
a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

G-SRT 2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

G-SRT 3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.

Prove theorems involving similarity

G-SRT 4. Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.

G-SRT 5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Define trigonometric ratios and solve problems involving right triangles

G-SRT 6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

G-SRT 7. Explain and use the relationship between the sine and cosine of complementary angles.

G-SRT 8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

G-SRT 8.1 Know and use angle and side relationships in problems with special right triangles.

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EDUCATIONAL SERVICES

Department: **Mathematics**

Course Title: **Geometry**   Course Number: **#0221**

Unit Title: **Circles**

Content Area Standards (Please identify the source): List content standards students will master in this unit.
• Understand and apply theorems about circles
• Find arc lengths and areas of sectors of circles

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

G-C 1. Prove that all circles are similar.

G-C 2. Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

G-C 3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

G-C 4. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.

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EDUCATIONAL SERVICES

Department: **Mathematics**

Course Title: **Geometry**   Course Number: **#0221**

Unit Title: **Expressing Geometric Properties with Equations**

Content Area Standards (Please identify the source): List content standards students will master in this unit.
• Use coordinates to prove simple geometric theorems algebraically

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Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

EDUHSD Standard 1. Use the equation of a circle in standard form to graph a circle and write the equation of a circle in standard form given the center and radius.

G-GPE 4. Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.

G-GPE 5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

G-GPE 6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

G-GPE 7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

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EDUCATIONAL SERVICES

Department: **Mathematics**

Course Title: **Geometry**   Course Number: **#0221**

Unit Title: **Geometric Measurement and Dimension**

Content Area Standards (Please identify the source): List content standards students will master in this unit.
• Explain volume formulas and use them to solve problems
• Visualize relationships between two-dimensional and three-dimensional objects

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Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Explain volume formulas and use them to solve problems

G-GMD 1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.

G-GMD 2. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. Visualize relationships between two-dimensional and three-dimensional objects.

G-GMD 3. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

G-GMD 4. Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.

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EDUCATIONAL SERVICES

Department: **Mathematics**

Course Title: **Geometry**   Course Number: **#0221**

Unit Title: **Modeling with Geometry**

Content Area Standards (Please identify the source): List content standards students will master in this unit.
• Apply geometric concepts in modeling situations

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Apply geometric concepts in modeling situations

G-MG 1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

G-MG 2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

G-MG 3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

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EDUCATIONAL SERVICES

Department: **Mathematics**

Course Title: **Geometry**   Course Number: **#0221**

Unit Title: **Definitions and Examples**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

• Identify and give examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

CA 1.0 Demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.

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