

1. COVER PAGE

Course Title Geometry P	Department or Discipline <input type="checkbox"/> History/Social Studies <input type="checkbox"/> English/Language Arts <input checked="" type="checkbox"/> Mathematics <input type="checkbox"/> Laboratory Science <input type="checkbox"/> Language other than English <input type="checkbox"/> Visual & Performing Arts (for 2003) <input type="checkbox"/> College Preparatory Elective: Subject Area: _____
School Arthur Andersen Community Learning Center	Grade Level(s) for which course is intended 9-12
District Alameda Unified	
City Alameda	
Name of School Contact Person Paul Bentz	Length of Course <input type="checkbox"/> Semester <input checked="" type="checkbox"/> Year <input type="checkbox"/> Other
Title/Position Facilitator	Unit Value <input type="checkbox"/> 0.5 (half year equivalent) <input checked="" type="checkbox"/> 1.0 (one year equivalent) <input type="checkbox"/> 2.0 (two year equivalent) <input type="checkbox"/> Other: _____
Contact Information Phone: 510-521-7123 x4 Fax: 510-521-7350 E-mail:	Seeking "Honors" distinction? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Date of School Board Approval	_____
Was this course previously approved by UC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If so, in what year? <u>1996-2000</u> Under what course title? <u>Geomeetry P (Encinal High School)</u>	
Pre-Requisites AACLC Algebra 1	
Co-Requisites None	
Brief Course Description The main purpose of the geometry curriculum is to develop geometric skills and concepts and the ability to construct formal logical arguments and proofs in a geometric setting. Although the curriculum is weighted heavily in favor of plane (synthetic) Euclidean geometry, there is room for placing special emphasis on coordinated geometry and its transformations.	

2. OPTIONAL BACKGROUND INFORMATION

Context for Course (optional).

How does this course fit into broader departmental and/or pathway structure? How does it fit into the overall school restructuring plans? Is the course intended to be a core course or supplemental? What are the student/school/community needs met by this course?

Geometry is expected to be a core course. Graduation standards at the AACLC require all learners to take and pass with a C or better, Algebra 1, Geometry, and Algebra 2 (taught in conjunction with physics.)

History of Course Development (optional).

Who was involved in the course development? Did you consult with UC Admissions personnel or UC professors? If so, what was the nature of such consultation and what was the result? Was this course modeled after another course at another school? If so, is that course UC approved? How does the course being submitted differ from the course after which it was modeled? Has this course received any special recognitions, designations or awards? Has it been articulated to local community colleges or universities?

Many of the course projects and activities were developed by Jim Richards, a former AACLC facilitator. Some of the current projects are being developed by Paul Bentz, who is currently teaching the course. Learners taking the course have been extremely successful in performing well on the Golden State Exam in Geometry. Course improvements have been made to increase the number of learners doing well on this exam.

3. COURSE CONTENT

Course Goals and/or Major Student Outcomes – A limited number of broad educational goals to be addressed by this course.

The geometry skills and concepts developed in this discipline are useful to all students. Aside from learning these skills and concepts, students will develop their ability to construct formal, logical arguments and proofs in geometric settings and problems.

... Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.

... 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 prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles.

... Students know and are able to use the triangle inequality theorem.

... Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.

... Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.

... Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and students commit to memory the formulas for prisms, pyramids, and cylinders.

... Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.

... Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.

... Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.

... Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.

... 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 prove theorems by using 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 elementary relationships between them. For example, $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$.

... 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 know and are able to use angle and side relationships in problems with special right triangles, such as 30o, 60o, and 90o triangles and 45o, 45o, and 90o triangles.

... 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 rotations, translations, and reflections.

Course Objectives – A list of specific student learning objectives. If you choose, you may also list appropriate academic content standards alongside each objective.

The geometry skills and concepts developed in this discipline are useful to all students. Aside from learning these skills and concepts, students will develop their ability to construct formal, logical arguments and proofs in geometric settings and problems.

Course Outline – A traditional course outline listing all topics and sub-topics, indicating both breadth and depth of coverage. As appropriate, please list major assignments (i.e. labs, essays, projects, etc.) alongside topics and sub-topics.

I. Points, Lines, Planes, and Angles

A. Basic figures

1. Points, Lines, and Planes

B. Definitions and Postulates

1. Segments, Rays, Distance, and angles

2. Postulates and Theorems relating points, lines, and planes

II. Deductive Reasoning

A. Using Deductive reasoning

1. If-then statements; Converses

2. Properties from Algebra and Proving theorems

B. Theorems about Angles and Perpendicular Lines

1. Special pairs of angles and Perpendicular lines

2. Planning a proof

III. Parallel lines and planes

A. When lines and planes are parallel

1. Definitions, properties of parallel lines and proofs

B. Applying parallel lines to polygons

1. Angles of a triangle, polygon and inductive reasoning

IV. Congruent Triangles

A. Corresponding parts in a congruence

B. Theorems based on congruent triangles

C. Proofs

V. Quadrilaterals

A. Parallelograms

B. Special Quadrilaterals

VI. Inequalities in geometry

A. Inequalities and indirect proof

B. Inequalities in triangles

VII. Similar Polygons

A. Ratio, proportion, and similarity

B. Working with similar triangles

VIII. Right triangles

A. Pythagorean theorem

B. Trigonometry

IX. Circles

A. Tangents, Arcs, and Chords

B. Angles and segments

X. Constructions and Loci

A. Basic constructions and locus

XI. Areas of Plane figures

A. Areas of polygons

B. Circles, similar figures and geometric probability

XII. Areas and volumes of solids

A. Prisms, Pyramids, Cylinders and Cones

B. Spheres

XIII. Coordinated Geometry

XIV. Transformations

Texts & Supplemental Instructional Materials -- A list of district-adopted core textbooks and/or core literature, followed by other readings, articles, reports, etc., indicating if materials will be used in part or in their entirety.

Text: Discovering Geometry: An Inductive Approach, Second Edition, Michael Serra, Key Curriculum Press, 1997.

Computer Software: Geometer's Sketchpad

Instructional Methods and/or Strategies – A general description of instructional methods including lecture, discussion, group work, readings, lab work, project-based learning, service-learning, library research, internet research, interviewing, videos, audiotapes, CD Rom, etc.

Project based learning, group work, individual work, readings, and group seminar with lecture. Course also involves extensive use of surveyor's transit for real projects, computer simulations involving Geometer's Sketchpad, and constructing model towers, and 3 – D architectural model built to scale.

Assessment Methods and/or Tools – A description of assessment methods, including exams, quizzes, papers, homework assignments, projects, participation, attendance, etc.

... Content exams = 40%

... Homework = 20%

... Projects = 40%

Assessment criteria – Indicate what criteria are used to assess student work. For example, has the school or department developed rubrics that define quality work? Until the State has published its academic performance standards, what is being used to define quality?

Learners are given ACLC developed project rubrics that define the grading performance standards for all projects. Examinations (written, oral, and take-home) are evaluated on a 10-point scale.