

EDUCATIONAL SERVICES

Course of Study Information Page

Course Title:	Architectural Design & Graphics (#0512)	
Rationale:	<p>The ability to effectively communicate ideas both visually and orally and an understanding of design and graphics are the basis for architecture and engineering. Additionally, understanding how to use the computer and related software will give the student the skills and knowledge demanded at the professional level.</p> <p>In this course students will express themselves visually and be able to showcase their own creativity within a framework of constructive criticism. Through instruction in the areas of technical drafting, sketching, computer graphics, and elements of design, the student is helped to develop and understand scientific theory and facts and underlying engineering, industrial, and architectural practices. The course is designed to give the student confidence in organizing ideas, the ability to work ideas into new and useful creations, and the satisfaction in the design to finished product process. The assignments in this class will prepare students for future college level work.</p>	
Course Description:	<p>Architectural Design and Graphics is an advanced course in which the student will develop a portfolio showcasing projects completed in the areas of Sketching, Architectural History, Structural Graphics, Architectural Design, and Presentation. The use and understanding of the computer as a design tool will also be stressed.</p>	
How Does This Course Align with or Meet State and District Content Standards	<p>This course is in the sequence of courses for both Construction Trades and Engineering Design pathways as set forward in the state standards. This course also meets the requirements for a college prep elective and UC "a-g" requirements and has been approved to meet the High School District VAPA requirement.</p>	
Length of Course:	One Year	
Grade Level:	10 - 12	
Credit:	<input checked="" type="checkbox"/> Number of units: <u>10</u> <input checked="" type="checkbox"/> Meets graduation requirements <input checked="" type="checkbox"/> Request for UC "a-g" requirements	<input checked="" type="checkbox"/> College Prep <input checked="" type="checkbox"/> Elective <input checked="" type="checkbox"/> Career Technical
Prerequisites:	Design 1 or Art 1 or Engineering Design 1	
Department(s):	Trades & Industry	
District Sites:	ORHS and UMHS	
Board of Trustees Adoption Date:	April 14, 2009	

Textbooks / Instructional Materials	Supplementary Materials
Date Adopted by the Board of Trustees:	NA

Course description that will be in the Course Directory:

Architectural Design and Graphics is an advanced course in which the student will develop a portfolio showcasing projects completed in the areas of sketching, architectural history, structural graphics, architectural design, and presentation. Use and understanding of the computer as a design tool shall also be stressed. At Oak Ridge, landscape design will be stressed.

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Department: **Trades and Industries**

Course Title: **Architectural Design & Graphics (#0512)**

UNIT/STANDARD #: Elements Of Design - 1.0

LEARNING OUTCOME:

A - Students understand the ways in which architecture is shaped by history and know significant events in the history of structural engineering.
 B - Students understand the theoretical, practical, and contextual issues that influence design.
 C - Students understand the relationship between architecture and the external environment.
 D - Students learn and implement the fundamentals of Architectural and Graphic Design by exploring the use of the Elements and Principles of Design.

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
<p>1. What students will learn, know, and be able to do? (Must be aligned to state content standards.)</p> <p>1. Learn the Principles and Elements of Design in approaching solutions to design problems. Have an understanding of <u>Artistic Perception</u> so students can apply to real world endeavors (analyzing and then responding to).</p> <p>2. Use line, value, color, texture, space, and volume to create projects in two and three dimension.</p> <p>3. Learn how balance, rhythm and repetition, emphasis and subordination, movement, variety, proportion, unity, opposition, and transition are used in the process of</p>	<p>2. Instructional strategies that will be used to engage students.</p> <p>A - Direct instruction utilizing instructor created examples, examples, slides, and demonstrations to illustrate the elements and principles of design and how they are used in the real world.</p> <p>B - Direct instruction to demonstrate how to use art materials and drafting tools to create lifelike drawings.</p> <p>C - Students create two-dimensional and three-dimensional sketches from two-dimensional and three-dimensional objects.</p> <p>D - View video of principles and elements.</p>	<p>3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples.</p> <p>Visual Assessment Projects. Peer review Use of Project Rubric</p>	<p>4. What will we do if students do not learn? (Outline the planned intervention strategies)</p> <p>Review and reassignment</p> <p>5. What will we do if students already know it?</p> <p>Peer tutoring and design team leader</p>

Architectural and Graphic Design.	<p>E - Using the Symmetrical and Asymmetrical designs given as examples, students create a series of Symmetrical and Asymmetrical designs using only straight lines, arcs and circles. A stained glass frame design will be used as the format.</p> <p>F - With the use of all the Principles and Elements of Design, students create 6 (1/4" scale) 16'x22' landscapes. Students will sketch and color 6 preliminary drawings of their designs on graph paper before finalizing their landscapes on 36"x24" paper.</p> <p>G - Using one's initials as a base, design a business logo. Students design five, two-dimensional designs and then select the "best" design to convert to 3D.</p>		
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Content Area Standards (Please identify the source)

<p>The students will demonstrate mastery of the following content standards:</p> <p>California Career Technical Education Model Curriculum Standards:</p> <p>A1.0 Students understand the ways in which architecture is shaped by history and know significant events in the history of structural engineering.</p> <p>A1.1 Know significant historical architectural and structural projects and their effects on society.</p> <p>A1.2 Understand the development of architectural and structural systems in relation to aesthetics, efficiency, and safety.</p> <p>A2.0 Students understand the theoretical, practical, and contextual issues that influence design:</p> <p>A2.1 Understand the ways in which socio-cultural conditions and issues influence architectural design.</p>

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Course Title: **Architectural Design & Graphics (#0512)**

UNIT/STANDARD # : Sketching and Journal Sketch Book - 2.0

LEARNING OUTCOME:
 A – To learn the process for building roofs.
 B – To experience commands necessary to use a computer aided drafting.
 C – To realize what is expected in a two-dimensional home design.
 D – To learn sketching techniques.

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
<p>1. What students will learn, know, and be able to do? (Must be aligned to state content standards.) 1. Imagine and then apply the conversion of a two-dimensional view to a three-dimensional model. Be able to use <u>Creative Expression</u> to perform and participate in art and architecture.</p> <p>2. Demonstrate sketching capability of design using lines, arcs, circles, shades, and shadows to express depth, volume, and space. Use the orthographic projection method to develop multi-view sketches. Develop pictorial sketches in both isometric and perspective modes.</p> <p>3. Learn the elements of the color wheel (primary, secondary, tertiary, visual properties, and hue, value, and intensity) and understand color</p>	<p>2. Instructional strategies that will be used to engage students. A. From an over-head view of various 2-D roofs, students create the 3-D model of that roof using poster board for construction. Students learn the algebraic formula for figuring the true length and then cut the roof model.</p> <p>B -Direct instruction of sketching techniques.</p> <p>C -Students break up into groups of two and design a small home using a computer aided drafting program. They learn how to design the floor, roof, and elevation plans. Fundamentals of design are encouraged to create designs. Architectural video presentation.</p> <p>D -Students will develop a color wheel</p>	<p>3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples.</p> <p>Visual Assessment Projects. Peer review Use of Project Rubric</p>	<p>4. What will we do if students do not learn? (Outline the planned intervention strategies)</p> <p>Peer tutoring and design team leader</p> <p>5. What will we do if students already know it? Review and reassignment</p>

<p>composition (monochromatic harmony, complementary harmony, analogous harmony, and triad harmony).</p> <p>4. Show proficiency in the use of the computer and AutoCAD software.</p>	<p>using colored pencils or pens. E - Students will create a variety of drawings using colored pencils or pens.</p> <p>F. Students break up into groups of two and design a small home using a computer aided drafting program. They learn how to design the floor, roof, and elevation plans. Fundamentals of design are encouraged to create designs.</p> <p>G -Using pencil or pen and ink, and given a number of different basic home plans and elevations, students lay out and draw one and then two point perspectives as architectural presentations.</p> <p>H- Using their chosen design, students draw a two-point perspective showing shades and shadows.</p>		
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Content Area Standards (Please identify the source)

The students will demonstrate mastery of the following content standards:

California Career Technical Education Model Curriculum Standards:

- C10.0 Students understand the sketching process used in concept development.
- C10.1 Understand the process of producing proportional two- and three-dimensional sketches and designs
- C10.2 Use sketching techniques as they apply to a variety of architectural and engineering models.
- C10.3 Use freehand graphic communication skills to represent conceptual ideas, analysis, and design concepts.

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Course Title: **Architectural Design & Graphics (#0512)**

UNIT/STANDARD #: Computer Aided Drafting and Design - 3

LEARNING OUTCOME: A - Students will understand the various CADD programs used to develop architectural designs.
 B - Students will understand the steps necessary to complete a project.

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
<p>1. What students will learn, know, and be able to do? (Must be aligned to state content standards.)</p> <p>1. Show proficiency in the use of the computer and AUTO CAD software to:</p> <ul style="list-style-type: none"> ▪ Create, edit, and print ▪ Manage files with ability to move information from one drawing to another <p>Create text, layers, and symbol libraries to enhance drawings.</p>	<p>2. Instructional strategies that will be used to engage students.</p> <ul style="list-style-type: none"> ▪ Use the computer to complete each page of the architectural drawing set. <p>From student design square subdivision, on the computer draw the square subdivision and use with pline and hatch.</p>	<p>3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples.</p> <p>Visual Assessment Projects. Peer review Use of Project Rubric</p>	<p>4. What will we do if students do not learn? (Outline the planned intervention strategies)</p> <p>Peer tutoring and design team leader</p> <p>5. What will we do if students already know it?</p> <p>Review and reassignment</p>

Content Area Standards (Please identify the source)

The students will demonstrate mastery of the following content standards:

Content Standards: California Career Technical Education Model Curriculum Standards:

- C5.0 Students know various object-editing techniques and CADD programs.
- C5.1 Understand the commands and concepts necessary for editing engineering drawings.
- C5.2 Know the various object-altering techniques.
- C5.3 Know the CADD components and the operational functions of CADD systems.
- C5.4 Apply two-dimensional and three-dimensional CADD operations in creating working and pictorial drawings, notes, and notations.
- A6.0 Students understand the use of computer-aided drafting and design (CADD) in developing architectural designs.
- A6.1 Know various CADD programs that are commonly used in architectural design.
- A6.2 Use CADD software to develop a preliminary architectural proposal.
- A7.0 Students understand how to systematically complete an architectural project.

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Course Title: **Architectural Design & Graphics (#0512)**

UNIT/STANDARD # : Architectural Design and Historical Perspective - 4

LEARNING OUTCOME:
 A - Students understand the ways in which architecture is shaped by history and know significant events in the history of structural engineering;
 B - Students understand the theoretical, practical, and contextual issues that influence design;
 C - Students understand the relationship between architecture and the external environment

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
1. What students will learn, know, and be able to do? (Must be aligned to state content standards.) 1. Make aesthetic decisions concerning architectural design. 2. Demonstrate an understanding of the great works of architecture and their influence on modern design.	2. Instructional strategies that will be used to engage students. <ul style="list-style-type: none"> ▪ Expose students to various works of architecture (slides, pictures), past and present. Have students apply historical criticism to make aesthetic judgments. ▪ Sketch examples of great 	3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples. Visual Assessment Projects. Peer review Use of Project Rubric	4. What will we do if students do not learn? (Outline the planned intervention strategies) Peer tutoring and design team leader 5. What will we do if students already know it?

<p>3. Review examples of modern residential architecture, learn how to compare and contrast the form and function.</p> <p>4. Be able to respond to the aesthetic value of an architectural structure.</p>	<p>works of architecture and site examples of the elements used in the design process.</p> <ul style="list-style-type: none"> ▪ Review examples of modern floor plans and their exterior elevations and write a narrative about each set. ▪ Apply aesthetic criticism to each structure in a series of architectural prints ▪ Recognize historical architectural styles in current design of windows, doors, arches, columns, etc. ▪ Sketches ▪ Lecture ▪ Write a review of an oral presentation or a written article from a professional journal 		<p>Review and reassignment</p>
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Content Area Standards (Please identify the source)

The students will demonstrate mastery of the following content standards:

California Career Technical Education Model Curriculum Standards:

A1.0 Students understand the ways in which architecture is shaped by history and know significant events in the history of structural engineering.

A1.1 Know significant historical architectural and structural projects and their effects on society.

A1.2 Understand the development of architectural and structural systems in relation to aesthetics, efficiency, and safety.

A2.0 Students understand the theoretical, practical, and contextual issues that influence design.

A2.1 Understand the ways in which socio-cultural conditions and issues influence architectural design.

A2.2 Understand the theoretical and practical effects of human and physical factors as well as cost analysis on the development of architectural designs.

A2.3 Use the necessary equipment for producing an architectural design and the methods and techniques for employing that equipment appropriately.

A2.4 Use freehand graphic communication skills to represent conceptual ideas, analysis, and design concepts

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Course Title: **Architectural Design & Graphics (#0512)**

UNIT/STANDARD # : Designing with Color - 5.0

LEARNING OUTCOME: A - Students understand the ways in which color can be used to enhance and elucidate architectural designs

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
<p>1. What students will learn, know, and be able to do? (Must be aligned to state content standards.)</p> <p>1.Learn the components of the Color Wheel</p> <ul style="list-style-type: none"> ✓ Primary ✓ Secondary ✓ Tertiary ✓ Visual properties <p>Hue, Value, and Intensity</p> <p>2.Understand color composition</p>	<p>2. Instructional strategies that will be used to engage students.</p> <ul style="list-style-type: none"> ▪ 1 - Using colored pencils or pens, develop a color wheel and graph the visual properties of hue, value, and intensity. Apply these to selected assignments. 2 - Add color to an architectural presentation project board. 3 - Apply a color scheme to assigned 	<p>3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples.</p> <p>Visual Assessment Projects. Peer review Use of Project Rubric</p>	<p>4. What will we do if students do not learn? (Outline the planned intervention strategies)</p> <p>Peer tutoring and design team leader</p> <p>5. What will we do if students already know it?</p> <p>Review and reassignment</p>

<ul style="list-style-type: none"> ✓ Monochromatic Harmony ✓ Complementary Harmony ✓ Analogous Harmony <p>Triad Harmony</p> <p>3. Understand Color Tools Pens, pencils, paints, water colors, etc.</p>	<p>Square Division, Town House and Landscape projects</p> <p>4 - Used a variety of tools on each assigned project</p>		
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Content Area Standards (Please identify the source)

<p>The students will demonstrate mastery of the following content standards:</p> <p>California Career Technical Education Model Curriculum Standards Visual and Performing Arts</p> <p>1.1 Analyze and discuss complex ideas, such as distortion, color theory, arbitrary color, scale, expressive content, and real versus virtual in works of art.</p> <p>2.6 Write technical documents (e.g., a manual on rules of behavior for conflict resolution, procedures for conducting a meeting, minutes of a meeting):a. Report information and convey ideas logically and correctly. b. Offer detailed and accurate specifications. c. Include scenarios, definitions, and examples to aid comprehension (e.g., troubleshooting guide).d. Anticipate readers' problems, mistakes, and misunderstandings.</p> <p>Energy and Utilities Industry Sector</p> <p>5.0 Problem Solving and Critical Thinking Students understand how to create alternative solutions by using critical and creative thinking skills, such as logical reasoning, analytical thinking, and problem-solving techniques.</p> <p>5.1 Apply appropriate problem-solving strategies and critical thinking skills to work-related issues and tasks.</p> <p>5.2 Understand the systematic problem-solving models that incorporate input, process, outcome, and feedback components.</p> <p>5.3 Use critical thinking skills to make informed decisions and solve problems.</p>
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Department: **Trades and Industries**

Course Title: **Architectural Design & Graphics (#0512)**

UNIT/STANDARD #: Pictorial Drawings and Sketches – 6.0

LEARNING OUTCOME: A - Each student will have the opportunity to develop both perspective sketches and mechanical (use of drafting equipment) perspective

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
<p>1. What students will learn, know, and be able to do? (Must be aligned to state content standards.)</p> <p>1. Learn how to layout and develop a one and or two point perspective.</p> <p>2. Learn how to layout and develop a two point perspective.</p>	<p>2. Instructional strategies that will be used to engage students.</p> <ul style="list-style-type: none"> ▪ 1 - Given a number of different simple plans and elevations, layout and draw one or two point perspectives as architectural presentations. <p>2 -Using their chosen design, draw a two point perspective showing shades</p>	<p>3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples.</p> <p>Visual Assessment Projects.</p> <p>Peer review</p> <p>Use of Project Rubric</p>	<p>4. What will we do if students do not learn? (Outline the planned intervention strategies)</p> <p>Peer tutoring and design team leader</p> <p>5. What will we do if students already know it?</p>

<p>3. Demonstrate the ability to add shades and shadows to perspective</p> <p>4. Learn how to use pen and ink on tracing paper drawings.</p>	<p>and shadows, in ink on Mylar.</p> <p>3 - Develop a perspective of a plan designed by the student</p> <p>4 - Develop a free hand rendering of a exterior of a building</p>		<p>Review and reassignment</p>
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Content Area Standards (Please identify the source)

<p>The students will demonstrate mastery of the following content standards:</p> <p>California Career Technical Education Model Curriculum Standards 1.4 Visual and Performing Arts</p> <p>1.1 Analyze and discuss complex ideas, such as distortion, color theory, arbitrary color, scale, expressive content, and real versus virtual in works of art.</p> <p>1.3 Analyze their works of art as to personal direction and style.</p> <p>2.3 Assemble and display objects or works of art as a part of a public exhibition.</p> <p>2.4 Demonstrate in their own works of art a personal style and an advanced proficiency</p> <p>4.6 Develop written criteria for the selection of a body of work from their portfolios that represents significant achievements.</p> <p>5.1 Speculate on how advances in technology might change the definition and function of the visual arts.</p> <p>5.3 Prepare portfolios of their original works of art for a variety of purposes.</p>

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Department: **Trades and Industries**

Course Title: **Architectural Design & Graphics (#0512)**

UNIT/STANDARD #: Model Building – 7.0

LEARNING OUTCOME: A - Students understand the ways to use CADD to design a professional model
B - Students understand the steps to create an architectural design from planning to finished project

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
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<p>1. What students will learn, know, and be able to do? (Must be aligned to state content standards.)</p> <p>1. Develop the necessary skills to copy blue prints, cut out plans and elevations, and mount on foam board to create a model of an architectural residence.</p> <p>2. Learn how to estimate needed scaled wood stock, and develop a stick frame model.</p>	<p>2. Instructional strategies that will be used to engage students.</p> <ul style="list-style-type: none"> ▪ Construct a model of the final design for the square subdivision project. ▪ From a set of drawings, construct a model to scale which shows an understanding of how to layout and cut a roof with proper ridge, hip, valley, and gables using poster board. ▪ Construct models using foam core as a base material. <p>Construct a stick frame scale model of the house plan the student designed.</p>	<p>3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples.</p> <p>Visual Assessment Projects. Peer review Use of Project Rubric</p>	<p>4. What will we do if students do not learn? (Outline the planned intervention strategies)</p> <p>Peer tutoring and design team leader</p> <p>5. What will we do if students already know it?</p> <p>Review and reassignment</p>
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Content Area Standards (Please identify the source)

<p>The students will demonstrate mastery of the following content standards:</p> <p>California Career Technical Education Model Curriculum Standards A6.0Students understand the use of computer-aided drafting and design (CADD) in developing architectural designs.</p> <p>A6.1 Know various CADD programs that are commonly used in architectural design.</p> <p>A6.2 Use CADD software to develop a preliminary architectural proposal.A7.0Students understand how to systematically complete an architectural project.</p> <p>A7.1 Develop, read, and understand architectural and construction plans, drawings, diagrams, and specifications.</p> <p>A7.2 Estimate the materials needed for a project by reading an architectural drawing.</p> <p>A7.3 Plan the sequence of events leading to an architectural project.</p> <p>A7.4 Develop a process to record the progress of a project.</p>
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Course Title: **Architectural Design & Graphics (#0512)**

UNIT/STANDARD # : Career Planning – 8.0

LEARNING OUTCOME: A - Students understand the ways to market themselves after high school and post secondary education
B - Students create a portfolio to showcase their best work

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
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<p>1. What students will learn, know, and be able to do? (Must be aligned to state content standards.)</p> <p>1. Learn how to develop a portfolio of their best work as a tool for both preservations and presentation.</p> <p>2. Learn how to acquire a letter of reference, develop a resume, and fill out a job or college application.</p>	<p>2. Instructional strategies that will be used to engage students.</p> <ul style="list-style-type: none"> ▪ Design a portfolio, using proper layout and design to show the work they completed in this class. ▪ As part of their portfolio, have someone write a letter of reference for them. ▪ Write a resume showing all education, work experience, and other interest. <p>Fill out a job application leaving no unanswered questions</p> <ul style="list-style-type: none"> ▪ Review sample resumes/templates ▪ Resume assessment <p>Complete job and/or college application</p>	<p>3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples.</p> <p>Visual Assessment Projects. Peer review Use of Project Rubric</p>	<p>4. What will we do if students do not learn? (Outline the planned intervention strategies)</p> <p>Peer tutoring and design team leader</p> <p>5. What will we do if students already know it?</p> <p>Review and reassignment</p>
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Content Area Standards (Please identify the source)

The students will demonstrate mastery of the following content standards:

California Career Technical Education Model Curriculum Standards A8.0 Students understand the methods of creating both written and digital portfolios.
A8.1 Develop a binder of representative student work for presentation.
A8.2 Produce a compact disc, Web site, or other digital-media portfolio.
A8.3 Give an effective oral presentation of a portfolio.

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UNIT/STANDARD #: Materials used in Architecture – 9.0

LEARNING OUTCOME: A - Students will understand the relationship between architecture and the external environment

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
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<p>1. What students will learn, know, and be able to do? (Must be aligned to state content standards.)</p> <p>1. Understand - from an historical perspective - how materials were used and how (up to the 1900's) the creativity of the designer was limited.</p> <p>2. Be able to recognize the basic types of materials used in architectural drawings.</p> <p>3. Be able to sketch, and develop hatches, that represent the basic types of materials used in modern architecture.</p>	<p>2. Instructional strategies that will be used to engage students.</p> <ul style="list-style-type: none"> ▪ Design different plots or interior spaces using the same square foot for each. Use as many types of materials as possible to create different themes for each frame. ▪ Develop a photo essay that shows a clear understanding of the way a variety of materials can enhance the quality of design in architectural buildings and landscapes. <p>When tested, be able to answer 90% correct the questions that relate to architectural materials, their symbols on drawings and use in the design process.</p> <ul style="list-style-type: none"> ▪ Lecture /demonstration on materials used in architecture ▪ Work sheet ▪ Quiz ▪ Apply knowledge of materials to student project ▪ Computer exercise <p>Apply hatches to student projects on CAD</p>	<p>3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples.</p> <p>Visual Assessment Projects. Peer review Use of Project Rubric</p>	<p>4. What will we do if students do not learn? (Outline the planned intervention strategies)</p> <p>Peer tutoring and design team leader</p> <p>5. What will we do if students already know it? Review and reassignment</p>
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Content Area Standards (Please identify the source)

The students will demonstrate mastery of the following content standards:

California Career Technical Education Model Curriculum Standards

- A3.1 Understand the influence of community context and zoning requirements on architectural design.
- A3.2 Develop a site analysis that considers passive energy techniques, sustainability issues, and landscaping.
- A3.3 Develop a preliminary proposal for a simulated architectural design.
- A3.4 Develop a complete set of architectural plans and drawings.
- A4.0 Students understand the mechanics and properties of structural materials.
- A4.1 Understand the integration of architectural factors, such as soil mechanics, foundation design, engineering materials, and structure design.
- A4.2 Understand various forces that bear on and within structures, including axial force, shear, torsion, and moment.
- A4.3 Know the various components of structures, including lighting; heating, ventilating, and air-conditioning (HVAC); mechanical; electrical; plumbing; communication; security; and vertical transportation systems.
- A4.4 Develop a stress analysis chart of a typical structural component.
- A4.5 Evaluate available building materials (e.g., steel and wood) by considering their properties and their effect on building form.
- A4.6 Develop a preliminary building plan by using the appropriate materials.
- A9.0 Students understand the effective use of architectural and structural equipment.
- A9.1 Use the methods and techniques for employing all architectural and structural equipment appropriately.
- A9.2 Apply conventional architectural and structural processes and procedures accurately, appropriately, and safely.
- A9.3 Apply the concepts of architectural and structural engineering to the tools, equipment, projects, and procedures of the Architectural and Structural Engineering Pathway.

EL DORADO UNION HIGH SCHOOL DISTRICT

EDUCATIONAL SERVICES

Department: **Trades and Industries**

UNIT/STANDARD # : Structural Graphics -10.0

LEARNING OUTCOME : A) Students understand the mechanics and properties of structural materials
 B) Develop a preliminary building plan by using the appropriate materials

LEARNING OUTCOME	INSTRUCTIONAL STRATEGIES	ASSESSMENTS	INTERVENTIONS
<p>1. What students will learn, know, and be able to do? (Must be aligned to state content standards.)</p> <p>1. Create a residential floor plan which demonstrates to include proper room layout, architectural symbols, dimensions, notes, and schedules.</p> <p>2. Demonstrate the ability to develop a foundation plan using a slab on grade or an inverted "T".</p> <p>3. Demonstrate the ability to draw necessary details based upon the type of foundation plan used.</p> <p>4. Learn the basic U.B.C. for foundations and be able to apply those rules to both types of foundations.</p> <p>5. Demonstrate the ability to draw the necessary exterior elevations, showing proper dimensions, structural members, notes, and architectural design details with a variety of textures and patterns that are aesthetically pleasing.</p> <p>6. Understand the basic types of roof structures, where they are used, and their relationship to the adjacent</p>	<p>2. Instructional strategies that will be used to engage students.</p> <ul style="list-style-type: none"> ▪ A -Layout a residential floor plan of about 1800 sq. Ft. that is aesthetically pleasing. <p>Given a quiz of the proper layout and symbols, the student will answer 85% of questions correctly.</p> <p>B - Based on the floor plan the student has designed, design a foundation plan with required notes, symbols, and flags</p> <p>C - Based on the foundation plan used: draw the proper details with flags, dimensions, and notations</p> <p>D -Identify the type of foundation detail, where it would be located on a foundation plan when given on a written exam with 85% correct.</p> <p>E -Based upon the floor plan and other necessary structural sketches, design and draw the exterior elevations for the plan set.</p> <p>F - On a quiz be able to identify the</p>	<p>3. How will we know that students have learned? Include both Formative (for learning) and Summative (of learning) assessment examples.</p> <p>Visual Assessment Projects. Peer review Use of Project Rubric</p>	<p>4. What will we do if students do not learn? (Outline the planned intervention strategies)</p> <p>Peer tutoring and design team leader</p> <p>5. What will we do if students already know it?</p> <p>Review and reassignment</p>

<p>elevation.</p> <p>7. Be able to draw full transverse (cross) and longitudinal sections, a typical fund, "W", and scissors truss.</p> <p>8. Be able to identify the major structural parts that need details.</p>	<p>basic roof shapes and be able to sketch how they look in the elevation with 90% correct.</p> <p>G - Based upon the floor plan the student has designed, locate the proper place for two types of sections and draw those sections with all necessary note, dimensions, and flags.</p> <p>H - Add to the above sections the necessary truss plans and details.</p> <p>I - On a quiz, be able to sketch the three types of trusses and label their major parts with 85% accuracy.</p>		
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Content Area Standards (Please identify the source)

<p>The students will demonstrate mastery of the following content standards:</p> <p>California Career Technical Education Model Curriculum Standards:</p> <p>A3.1 Understand the influence of community context and zoning requirements on architectural design.</p> <p>A3.2 Develop a site analysis that considers passive energy techniques, sustainability issues, and landscaping.</p> <p>A3.3 Develop a preliminary proposal for a simulated architectural design.</p> <p>A3.4 Develop a complete set of architectural plans and drawings.</p> <p>A4.1 Understand the integration of architectural factors, such as soil mechanics, foundation design, engineering materials, and structure design.</p> <p>A4.2 Understand various forces that bear on and within structures, including axial force, shear, torsion, and moment.</p> <p>A4.3 Know the various components of structures, including lighting; heating, ventilating, and air-conditioning (HVAC); mechanical; electrical; plumbing; communication; security; and vertical transportation systems.</p> <p>A4.4 Develop a stress analysis chart of a typical structural component.</p> <p>A4.5 Evaluate available building materials (e.g., steel and wood) by considering their properties and their effect on building form</p>
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