

Glendale Unified School District

High School

June 19, 2018

Department: Career Technical Education

Course Title: Construction 1-2 (replace Construction 1-2; 5494/5495)

Course Code: 5494V/5495V

Grade Level(s): 9-12

School(s)
Course Offered: Glendale High School

UC/CSU Approved
(Y/N, Subject): Y, Visual & Performing Arts ("f") / Interdisciplinary Arts

Course Credits: 10

Recommended
Prerequisite: none

Recommended
Textbook: Carpentry, Leonard Koel, American Technical Publishers, Inc, 3rd Ed., 1997

Course Overview: Construction 1-2 is the introductory course for the Building and Construction Trades industry Sector and Cabinetry, Millwork and Woodworking pathway. This course will teach comprehensive design skills and concepts based on the elements and principles of design and applied through construction elements, using design and fabrication techniques that will have direct, relevant applications in the field. Students completing the course will have a familiarity with many of the basic job skills in the construction trades and will have applied them to creative problem solving in design projects. The physical products that the students produce will have the functionality of traditional shop projects, but will also demonstrate refined and diverse design concepts and applications.

First Semetser-Course Content:

Unit 1: **Safety**

(3 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.1, 2.6, 2.5, 4.1, 5.1, 6.2, 6.3, 7.1, 7.1, 9.6, 9.7, 10.1, 11.1

Cabinetry, Millwork and Woodworking Pathway Standards: A1.1, A1.2, A2.1, A2.3, A3.1, A.10.1, A11.1, A11.2

Common Core State Standards: LS 11-12.6, RLST 11.12.2, WHSST 11-12.2, A-REI 10

- A. This unit will teach basic safety awareness in the studio and on job sites, and will qualify students to safely use a range of hand and power tools. Students will be introduced to the concepts of work ethics, creative discipline, unfettered brainstorming, and creative problem solving in different contexts. In addition to developing broader workplace awareness for safety reasons, students will also be introduced to ideas of environmental awareness, including local geology and soil typology, both for the contextual effectiveness and sustainability of their designs. Each unit will scaffold and build to a Key Assignment which will carry over to the next unit. Each unit will have referential components to previous and following units.
- B. Tool Safety Qualification: Students will observe safe handling demonstrations by an interdisciplinary team of teachers following OSHA regulations. Students will also receive text and video instruction, and take written safety quizzes. At the end of this lesson students will have demonstrated their knowledge of hand and power tool safety for both art making and construction on paper, and then physically demonstrate safe handling and general proficiency with all hand and power tools used in the course.

Unit 2: **Drawing**

(4 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.4, 2.5, 2.6, 4.1, 4.3, 5.1, 5.2, 7.2, 9.1, 10.1,

Cabinetry, Millwork and Woodworking Pathway Standards: A1.5, A1.8, A3.1, A3.4, A4.6

Common Core State Standards: LS 11-12.6, RLST 11-12.2, 11-12.7, 11-12.9, WHSST 11-12.5, G-GPE 4, CC 1, CC 2, CC 6

- A. Students will make full size and scale drawings of 3 projects. Drawing will include: measurements, architectural symbols and machining and joinery locations.
- B. 1. Students will make a full size drawing of a pencil holder, four different drawing with dimensions and machining specifications.
2. Students will make two drawings of a model house: 1 floor plan and 1 framing plan. Students will then construct a model house.
3. Students will make 2 scale drawing of a cell phone speaker, drawing all dimensions and boring locations. Students will then construct their own speaker.

Unit 3: **Paint and Finish**

(5 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.1, 2.2, 4.1, 5.2,9.1,10.1, 11.1

Cabinetry, Millwork and Woodworking Pathway Standards: A1.1, A1.5, A1.3, A2.3, A3.6, A5.13

Common Core State Standards: LS 11-12.6, RSIT 11-12.2, 11-12.7, 12-12.10, RHSS 11-12.7, RLST 11-12.2

- A. This unit will teach the importance of dark and light Value, introduce staining and other material handling with coverings, coatings, and washes related to paint.
- B. Assignments:
1. Tone Grounds. Students will continue to practice drawing objects from observation (begun in Unit 2) and will begin to add shading. These drawings will be covered with middle-tone grounds to transform them into finished paintings using dry rubs of dirt and clay. Students will demonstrate understanding of dark and light value by erasing away light areas in their compositions and adding darks with pencil and other art media such as charcoal and colored pencil.
 2. Value Swatches. In these exercises students will learn to do smooth gradations (blended transitions and fades) from dark to light using dry material such as dirt and charcoal. They will also learn masking using tape and eraser shields for clean edges. They will demonstrate their proficiency with gradations by generating a series of value strips in sketchbooks.
 3. Stains. Students will review safe handling of solvent based materials and will do a series of value gradations using stain and paint. They will be introduced to rag-off techniques and use masking and painted resist coating (masking fluid or acrylic gel) for clean edges. They will demonstrate proficiency with gradations using water based and solvent based stains and paints on wood panels.
 4. Stained drawings. Silhouette cut-outs from Unit 2 drawings will be stained with design images and gradations.

Unit 4: **Framing and Construction Techniques**

(6 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.1, 2.2, 4.1, 5.1, 5.2, 5.4, 6.1, 7.1, 8.1, ,9.1,10.1, 11.1

Cabinetry, Millwork and Woodworking Pathway Standards: A3.1, A3.2, A3.3, A4.6, A 4.7, A5.1, A5.2, A5.3A7.1, A7.2

Common Core State Standards: WHSST 11-12.5, 11-12.5, 11-12.6, LS 11-12.6, RSIT 11-12.2, 11-12.7, 12-12.10, RHSS 11-12.7, RLST 11-12.2

- A. Unit 4 will reinforce Unit 2 skills of precision cutting and will introduce compositional planning for 2-D and 3-D projects. Students will become familiar with the visual and practical elements of spatial planning. They will be introduced to basic joinery, structural principles, and California Building Codes that pertain to framing. This unit will also introduce students to permit processes and the soft skills involved in application inquiries.
- B. Assignments:
1. Compositional Thumbnails. Students will learn the basics of 2-D visual composition (the rule of thirds, center, offset, balanced, imbalanced, symmetrical, and “ideal.”) They will discuss the characteristics of each and will demonstrate their understanding by drawing four original, ideal compositions in sketchbooks.
 2. Introduction to Linear Perspective. In this series of exercises students will become familiar with drawing in 1 point and 2 point perspective and will practice with a variety of geometric shapes in sketchbooks.
 3. Introduction to Framing. Students will do planning drawings for framed houses and rectangles in 2 point perspective. They will learn code requirements for framing of buildings and for concrete forms and will demonstrate their knowledge by correctly answering sample questions from contractor licensing exams. After producing hand generated images they will then be created by the students. Students will review safety procedures and will build their wooden frames.

Second Semester-Course Content

Unit 5: Color

(6 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.3, 2.4, 4.3, 5.2, 5.3, 5.4, 6.1, 6.2, 7.1, 8.1

Cabinetry, Millwork and Woodworking Pathway Standards: A1.6, A2.3, A3.2, A4.1

Common Core State Standards: Ws11-12.7, WHSST 11-12.7, 11-12.9, 11-12.10, RSIT 11-12.2, 11-12.7, 11-12.10

- A. This unit will address color theory, house painting, and begin to introduce elements of interior design-painting, color theory, spray paint and stencils.
- B. Assignments:
1. Introduction to Color Theory. In this unit students will become familiar with the color wheel and will produce a painted color wheel by measuring and drawing a dodecagon in sketchbooks, then painting it with watercolor. Students will become familiar with the psychological and physiological effects of different colors and will demonstrate their knowledge of warm and cool color balance by painting their projects.
 2. Introduction to Paints. After a safety review of solvent based materials, students will become familiar with the different qualities of water based and solvent based

paints. They will practice a variety of brush techniques and will review masking techniques from Unit 3. They will demonstrate their proficiency with painting techniques by generating sample swatches of flat washes and gradations (blending and dry-brushing) on wood and paper.

3. Introduction to house painting. Students will practice paint stripping with a variety of techniques and will learn to use and maintain a spray rig.

4. Introduction to spray paint and stencils. Students will learn spray painting techniques. They will demonstrate their proficiency with spray paint by generating a design using thumbnails in sketchbooks, then cutting a stencil out of railroad or bristol board and spraying it with both hard and soft edges.

Unit 6: **Engineering and Design**

(6 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.5, 2.6, 3.1, 3.2, 5.1, 6.1, 6.2

Cabinetry, Millwork and Woodworking Pathway Standards: A1.5, A1.6, A1.9, A4.6, A4.7, A5.3, A5.4, A5.5, A5.9

Common Core ELA Standards: LS 11-12.6, RSIT 1-12.2, 11-12.7, RHSS 11-12.7, RLST 11-12.2, ETS1.A, ETS1.B

A. Students will learn basic concepts of engineering through 3 design build projects.

B. Assignments:

1. Paper chain-students will design and build a 3 link paper chain using paper and glue only. Chains will be tested for strength and strength through design will be evaluated.

2. Paper column-students will design and build a column using only paper and glue. Columns will be tested for strength and effectiveness of design and construction.

3. Spaghetti Bridge-Students will design and construct a "truss" bridge, drawing the truss design. Bridges will be tested for strength to weight ratio and evaluated for design and construction elements.

Unit 7: **Environmental Design**

(6 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0,2.3, 2.4, 3.3, 4.1, 4.2, 5.1, 6.1, 6.2,

Cabinetry, Millwork and Woodworking Pathway Standards: A1.9, A2.3, A3.5, A3.6, A5.13, A7.10

Common Core ELA Standards: LS 11-12.6, RSIT 11-12.10, ELAT 11-12.2, 11-12.10, WS 11-12.4, 11-12.5, 11-12.6

A. Unit 7 will review and reinforce student's knowledge of geology, soil typology, biomes,

and ecosystems. It will build on the concepts of permaculture, biodynamics, bioswales, storm drain filtration, expand on more advanced concepts of landscaping. It will reinforce and expand on the green building techniques that have been introduced in previous units.

- B. This unit will build on what students have learned about basic principles of environmental integration and sustainability. They will demonstrate their knowledge in the final, long-term project of a full house design complete with multi-page plans and an integrated landscape and garden plan which will be approved by a multidisciplinary faculty group.