

Glendale Unified School District

High School

June 19, 2018

Department: Career Technical Education

Course Title: Construction 3-4 (replace Construction 3-4; 5496/5497)

Course Code: 5496V/5497V

Grade Level(s): 10-12

School(s)
Course Offered: Glendale High School

UC/CSU Approved
(Y/N, Subject): Pending

Course Credits: 10

Recommended
Prerequisite: none

Recommended
Textbook: Modern Carpentry, Willis H. Wagner & Howard Bud Smith, Goodheart-Wilcox Company, 11th Ed., 2008

Course Overview: Construction 3-4 is the concentration course for the Building and Construction Trades industry Sector and Cabinetry, Millwork and Woodworking pathway. The purpose of the course is to provide students the opportunity to develop their skills in foundation in art and design elements through the woodworking process. Students will learn about furniture styles, construction, and proper design so as to accommodate the characteristics of the material(s) being utilized. Project strength, durability, and overall quality will be emphasized in student projects through proper design utilizing appropriate joinery and superior craftsmanship. The hands-on nature of this course is intended to not only develop the students' ability to successfully fabricate their project, but will also provide opportunities for collaborative work habits, will encourage an appreciation for fine design and craftsmanship, and will develop self-

confidence in acquiring new knowledge and skills. The goal of the course is to expose the students to each of the woodworking and artistic processes, while applying a method or technique through project based learning.

First Semester-Course Content

Unit 1: Safety

(3 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.1, 2.6, 3.3, 4.1, 5.1, 6.1, 6.2, 6.3, 7.1, 7.1, 9.7

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: RSIT 11-12.2, 11-12.7, 11-12.10, RHSS 11-12.7, RLST 11-12.2

- A. Safety protocols for machines and tools to be used will be reviewed to insure student safety with the culminating activity being a written Safety Tests. Any tools or machines new to students will be discussed, demonstrated, and any safety test deemed appropriate will be administered.
- B. Student to review and complete Safety Study Guides and are to take and pass Safety Tests with a score of 90% or higher and they will complete “write-outs” for any missed questions. In the case of a lower than 90% score, the student will re-study, obtain any necessary help, and retake safety test. A Study Guide and Safety Test will be administered for tools and machines not previously covered as appropriate.

Unit 2: Measuring

(4 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.1, 2.2, 2.3, 5.1,

Cabinetry, Millwork and Woodworking Pathway Standards:A1.6, A2.3, A3.4, A4.1, A4.2, A5.11

Common Core State Standards: A-REI 10, A-CED 1.1, A-REI 10, G-GMD 1, 4, 5, G-GPE 4, 7

- A. Instruction in “Imperial” measuring will be taught to ensure students gain the skills and knowledge necessary to increase their accuracy of measuring by demonstrating appropriate measurements used in construction and the art of designing their piece/project.
- B. Students will complete regular quizzes (with “speed rounds”) to increase speed and accuracy of determining dimensions/measurements.

Unit 3: Design

(4 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.1, 2.2, 3.1, 3.2, 4.5, 5.0, 5.1,

Cabinetry, Millwork and Woodworking Pathway Standards: A1.1, A1.2, A1.3, A1.4, A1.5, A2.1, A2.2

Common Core State Standards: LS11-12.6, RSIT 11-12.2, 11-12.10, RHSS 11-12.7, RLST 11-12.2, WS11-12.2

- A. Students will gain and appreciate the aesthetic value of the many styles of furniture, art, utilitarian design with the ability to use critical thinking. Students will increase their own awareness of aesthetic beauty by critically comparing many designs of their work to the community they live in and the world. Using aesthetic judgment and valuing, students will describe, analyze, interpret, and then judge their own artistic talent and work according to course standards and the fundamentals of art and design. These elements will be met by direct instruction and guided practice.

- B. Students will learn to implement the fundamentals of Art and Design by creating projects exploring the use of the Elements and Principles of Design. Students will draw creative projects that will incorporate negative mass, width, and depth. Students will express their creativity by developing projects with finishing techniques utilizing color and stock selection. Students will demonstrate their creativity by using the fundamentals of art and design to produce original works utilizing texture, balance, object features, variety, unity and movement etc. Students will design and build projects with tools to express their creative side and they will also use their artistic talent to present their project to the class for demonstration.

Unit 4: **Joinery and Fasteners**

(3 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.5, 2.6, 4.1, 4.2, 5.1, 5.2, 5.3

Cabinetry, Millwork and Woodworking Pathway Standards: A6.1, A6.2, A6.3, A7.1

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

- A. Students will review and learn new joinery methods used in furniture construction. Students will learn the importance of avoiding cross-grain situations where wood movement (expansion and contraction) cannot be accommodated through the proper selection of material, wood joinery, and fasteners. Students will learn how to reinforce joinery through the use of mortise and tenon, pocket holes and dominos. Students will learn artistic woodworking joinery such as dovetails and box/finger joints.

- B. Assignments: Hands-on practice and quizzes will lead up to students employing these methods while constructing their furniture pieces.

Unit 5: **Designing a Piece of Furniture**

(5 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.5, 2.6, 3.7, 4.5, 5.1, 5.2, 6.3, 6.4, 6.6,
Cabinetry, Millwork and Woodworking Pathway Standards: A5.1, A5.2, A5.3, A5.6, A5.11,
A5.12, A7.1, A7.2, A7.7

Common Core State Standards: RLST 11-12.10, F-TF 1.1, G-C 1, G-GMD 1, 4, 5, G-GPE 5, 7

- A. Students will learn about/review “scaled” and “non-scaled” drawings, and methods that may be used to determine pleasing proportions will be discussed (such as the golden ratio). Students will be provided historical reference to classic styles of furniture such as cabinets, chairs, solar power lunch boxes and how these styles can be incorporated into the furniture they construct.
- B. Assignments: Students will generate a concept sketch, then a final drawing of what will be their project. Drawing may be an isometric or three-view drawings) as deemed appropriate by the teacher (both types of drawings were covered in Wood Design). All drawings will show proper extension and dimension lines, fractional dimensions, and auxiliary views as needed. Students will then generate a final material cut-list for their project. Students will also research furniture styles and prepare a report/presentation to present to their class.

Second Semester-Course Content

Unit 6: **Production Methods**

(4 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.5, 2.6, 5.1, 5.2, 5.4, 6.1, 6.2, 7.1, 7.2, 8.1
Cabinetry, Millwork and Woodworking Pathway Standards: A1.6, A1.7, A1.8, A1.9, A2.3, A3.1,
A4.6, A4.7, A5.8, A5.9, A6.11, A6.12, A6.13, A7.2, A7.3

Common Core State Standards: RLST 11-12.2, RSIT 11-12.2, 11-12.10, WS 11-12.2, 11-12.4

- A. Students will quickly review the process of “Squaring Material” and the means of replicating parts for a project by utilizing production systems/methods. Students will learn/review the importance of appropriate use of machinery, precision cutting and machining of wood. They will strive to continually check for quality and will correct deficiencies as needed (sometimes in creative ways (rather than starting over). The

production value of jigs and fixtures to insure uniformity of parts and efficiency of fabrication will be explored as well as how they increase safety. Examples include adding adjoining parts, and sleds used on the table saw.

- B. Assignments: Quizzes on concepts and identification of terms and tools will be given, but ultimately the primary assignment will be to employ the concepts and methods while fabricating their student project.

Unit 7: **Making a Adirondack Chair**

(5 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.5, 2.6, 3.7, 4.5, 5.1, 5.2, 6.3, 6.4, 6.6,7.1, 7.2, 10.3, 10.4, 10.5, 11.1, 11.2, 11.3

Cabinetry, Millwork and Woodworking Pathway Standards: A7.1, 7.2 7.3, 7.4, 7.5, 7.11, 7.12, A8.1, A8.2, A9.0, A9.2, A9.3

Common Core State Standards: RSIT 11-12.2, 11-12.10, RLST 11-12.2, 11-12.10, G-SRT 8.1, G-GPE 5

- A. Students will mill material to specifications on their plan (a multi-step process). Students will form plans, make templates, measure cut and mill materials. Create and assemble chair parts to complete an Adirondack Chair. Students will finish the chair with a variety of finishes, stain, paint and clear coats.
- B. Students will create a plan, make and draw the templates to produce parts, assemble parts and put a finish on the chair.

Unit 8: **Solar Lunch Box**

(5 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.5, 2.6, 3.7, 4.5, 5.1, 5.2, 6.3, 6.4, 6.6,7.1, 7.2, 10.3, 10.4, 10.5, 11.1, 11.2, 11.3

Cabinetry, Millwork and Woodworking Pathway Standards: A7.1, 7.2 7.3, 7.4, 7.5, 7.11, 7.12, A8.1, A8.2, A9.0, A9.2, A9.3

Common Core State Standards: RSIT 11-12.2, 11-12.10, RLST 11-12.2, 11-12.10, G-SRT 8.1, G-GPE 5

- A. From plans that students have worked on creating and drawing, they will create a wooden box, install solar panels, wire a solar battery for a complete solar battery charger (lunch box).

- B. Build a box that includes cutting, machining and assembling parts. Install solar panels, complete all wiring and install electrical assembly. Install hinges and locking mechanisms.

Unit 9: **Shop, Machinery, and Tool Maintenance**

(5 weeks)

STANDARDS

Building and Construction Anchor Standards: 1.0, 2.5, 2.6, 3.7, 4.5, 5.1, 5.2, 6.3, 6.4, 6.6, 7.1, 7.2, 10.3, 10.4, 10.5, 11.1, 11.2, 11.3

Cabinetry, Millwork and Woodworking Pathway Standards: A6.10, A6.11, A6.12, A7.1, 7.2, 7.3, 7.4, 7.5, 7.11, 7.12, A8.1, A8.2, A9.0, A9.2, A9., 10.1, 10.2

Common Core State Standards: RSIT 11-12.2, 11-12.10, RLST 11-12.2, 11-12.10, G-SRT 8.1, G-GPE 5, G-GMD 5

- A. Throughout the course the proper care and maintenance of machines and tools will be demonstrated and discussed as it is the proper alignment and calibration of machines and tools, and their sharp cutting edges, that permit the fabrication of quality products while ensuring operator safety.
- B. Quizzes on concepts and identification of terms, tools and tool parts will be given. Ultimately students will demonstrate the ability to detect and correct any machine or tool deficiency that might compromise quality, efficiency, or safety.