

Glendale Unified School District

High School

June 19, 2018

Department: Career Technical Education

Course Title: Construction 5-6 (replace Construction 5-6; 5498/5499)

Course Code: 5498V/5499V

Grade Level(s): 11-12

School(s)  
Course Offered: Glendale High School

UC/CSU Approved  
(Y/N, Subject): Y, "g" General Elective

Course Credits: 10

Recommended  
Prerequisite: Completion of Construction 3-4 with a grade of C or better

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

Course Overview: Construction 5-6 is the second concentration course for the Building and Construction Trades industry Sector and Cabinetry, Millwork and Woodworking pathway. This course provides students an overview of the various materials used in construction. After receiving an introduction into fundamental principles of structural, physical and long-term performance, students learn about material and product manufacturing techniques and how they relate to mechanical and non-mechanical properties of the various materials. Common construction methods are introduced and building details are explored. Students have the opportunity to experience material capacity and behavior as well as construction methods in demonstrations and lab experiments. Furthermore, material applications and detailing in structural and non-structural building components are explored. Resulting from this course, students will gain a comparative

knowledge of material properties and possible applications in construction and architecture.

### **First Semester-Course Content**

#### **Unit 1: Safety**

*(4 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. This unit serves as an introduction to the course. The scope of the course includes the classroom policies and procedures as well as class/workplace emergency procedures. Special emphasis is placed on Cal/OSHA standards for the construction industry as well as personal responsibility in the workplace. Career exploration in the construction industry as well as examining issues that address gender/equity issues. Examination of the impact of EPA legislation on industry practices as well as the proper disposal of hazardous materials. The role of LEED Green Building Rating System in the major implementation of technical instruction and practical experience in residential and commercial construction using sustainable and green technology.
- B. Safety Presentation: Using what they've learned about safety in the lab, students will create a PowerPoint or Google Slide presentation on all safety regulations directly related to the Building and Construction Trades industry sector. Students will need to cover classroom policies and procedures as well as emergency procedures in the classroom and in the workplace. Students will need to research OSHA standards and cover a minimum of 3 workplace safety standards in their presentations. Students must also cite OSHA in their presentations using in-text citations or a works cited page at the end of their presentations.

Safety Exam: Students will obtain industry knowledge of advanced safety procedures that will continue to be integrated through the rest of the course. Students have pass a safety exam with 100% to be able to operate machinery. Students will master the safety test at 100% to be able to move through the classroom. Additionally, they will be continually modeling safety in the lab.

Initial Resource Management Review for shed Structure: Using what they've practiced in their previous assignment, students will need to calculate labor plans for a shed structure. They will need to calculate the time needed to complete various steps in

building the structure from: time to draft blueprints, time needed to frame the structure, time needed to complete roofing, finishes.

Unit 2: **Measurement and Blueprint Reading**

(9 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. Students will learn how to identify the elements and symbols commonly included in a set of blueprints. Students will also be able to demonstrate the use of scale, square footage, and linear measurement in architectural drawings.
- B. Assignments:  
Generic Blueprint: Students will create a blueprint of a single room structure like a shed, classroom, or woodshop from which they will do mathematical calculations for lineal foot / trim, square footage for concrete foundation. They will also identify the the appropriate architectural symbols for electrical, plumbing and mechanical aspects of the plan.

Shed Blueprint: Students will learn, apply and demonstrate skills needed to build a model of a basic foundation, residential interior wall and roof framing. Students will create blueprints for a four foot by three foot shed style structure. All students will be required to complete mathematical processes in measurement, decimal conversions, fractions, geometry and algebraic fundamentals when creating their blueprints.

Unit 3: **Framing and Roofing**

(6 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, A6.11, A6.12, A6.13, A7.1, A7.2, A7.7, A7.11, A7.12

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

- A. Students will learn and apply skills needed to properly measure and calculate concrete volume, measure board feet and area for roofing material. Students will also learn basic skills necessary to form concrete pads and footings, including laying rebar and finishing the concrete. The framing aspect will address the skills needed to properly frame a wall, door, window and ceiling joists. The roofing section will cover the fundamental needs of

roofing a residential home and applying flashing and drip edge.

- B. Calculating Roofing Material: Students will learn, apply and demonstrate skills needed to build a model of a basic foundation, residential interior wall and roof framing. Students will receive various blueprints with roofing measurements. They will need to calculate the volume of concrete, and measure the board feet area for roofing material. Framing a Shed Structure: Using teacher provided construction drawings, students will construct the framing. Students will frame a shed structure using standard framing techniques and by using their floor plans for a shed structure, students will build the frame for their structures.

## Second Semester-Course Content

### Unit 4: Electrical, Plumbing, Insulation, HVAC, Communication

(9 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: A1.1, A1.4, A1.5, A1.6, A3.1, A6.1, A6.2, A6.3, A7.1

Common Core State Standards: LS 11-12.6, WS 11-12.10, RSIT 11-12.2, 11-12.10, RLST 11-12.2, 11-12.7, 11-12.9

- A. This unit serves as an introduction to the Electrical, Plumbing, Insulation and HVAC trades. These trades will be introduced with a variety of teaching methods such as powerpoint presentation, lecture and shop demonstrations. Upon completion of this unit, students will be able to use trade specific terminology to demonstrate their understanding of trade procedures. An emphasis will be placed on job site safety and workplace conduct throughout the unit. At the end of the unit, students will be able to independently complete a small project in each of the specific trade skills.
- B. Assignments:
1. Updating the Shop: Students will demonstrate these trades by installing plumbing, electrical and insulation material in a practice wall within the shop area. The plumbing will be pressure tested and the electrical will be tested with low voltage.
  2. Plumbing, Electrical & Insulation: Students will demonstrate plumbing techniques by connecting appropriate rigid PVS pipe and flex PVC using newer connection processes using the framed wall module from the earlier framing unit.
  3. Students will use appropriate plumbing pipe fittings to make a typical sink connection. Students will then place insulation (or model insulation) in their structures.
  4. Students will also use the framed module to run typical housing electrical connections. These connections to include typical wall plugs, two-way and single switch

light connections. Students will demonstrate use of electrical tools in stripping wire and making all connections according to the building code.

Unit 5: **Drywall, Finishing, Carpentry and Tiling**

(10 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: A3.1, A3.2, A3.3, A4.1, 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: WHSST 11-12.5, 11-12.6, RSIT 11-12.2, 11-12.10, RLST 11-12.2, 11-12.10, G-SRT 8.1

- A. This unit focuses on the materials available and their characteristics, sources, and applications. Properties and appropriate uses for interior construction and finish materials are explored. Through lectures, presentations, and the preparation of construction details, students become familiar with the application of a wide variety of interior materials and finishes including: implementing on-site safety procedures; using proficiently all the tools used in class; maintaining the sharpness and/or optimum condition of tools; hanging an interior door; trimming out doors and windows; installing a baseboard; cutting and installing crown molding; installing wood flooring; constructing closet built-ins; constructing and installing shelving (ex: Students will be able to understand and apply measures of central tendency.)
- B. Assignments:
1. Finish Carpentry: Students will examine the history and progression of the tools used in finish carpentry, and how these tools developed and have been implemented over the last century and how this has helped the progression of technology. Students will learn to physically use these tools as well as the types of materials to use them on class projects. Students will create a manual on how to use 3 types of finishing tools.
  2. Roofing, Painting and Revised Resource Management Review: Students will, again use the framed module to demonstrate the use of roofing tools and techniques in covering the modular structure with typical asphalt shingles. Students will use appropriate tools to install appropriate flashing and weather-stripping.
  3. Students will use appropriate paint tools to do "cutting in" and trim work as well as wall painting using the dry walled modular building. All trim work to be primed and painted with both oil and water based paint. An emphasis on both brush and roller work with the integration of proper environmental cleaning techniques.