Glendale Unified School District

High School

June 19, 2018

Department:	Career Technical Education
Course Title:	Technical Cabinet Making & Carpentry 9-10 (replace Tech Cab Crp 5-8; 5507/5508)
Course Code:	5507D/5508D
Grade Level(s):	12
School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	Yes, College-Preparatory Elective ("g")/Interdisciplinary
Course Credits:	10
Recommended Prerequisite:	Completion of Construction 5-6 with a grade of C or better.
Recommended Textbook:	Modern Carpentry, Willis H. Wagner & Howard Bud Smith, Goodheart-Willox Company, 11th Ed., 2008
Course Overview:	Technical Cabinet Making and Carpentry 9-10 is the capstone course under the Building and Construction Trade Industry Sector, Cabinetry, Millwork and Woodworking pathway. Technical Cabinet Making and Carpentry 9-10 integrates skills and concepts from the Building and Construction Trades with applied mathematics and English. Students apply advanced levels of craft skills required to design and build a piece of furniture that meet current code requirements. Students make real-world connections between construction, math, and English using written projects, construction documents that include creating advanced professional blueprints and student-centered construction projects. This course provides students the opportunity to apply academic knowledge and technical skills through a hands- on curriculum that meets pre-

apprenticeship requirements for the National Building Trades Council and Construction employment trends.

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. Students receive instruction and extended practice in the orientation and industry awareness of the construction industry. Students understand and use the vocabulary of the construction trades, as well as the the vocabulary of various math concepts as they apply to the construction industry. They study math and building sequences related to measurements, geometry, and practical building applications that are related to the construction industry. Learners will receive instruction in measurement and marking/layout, the fundamental skills which will be needed to complete all of the applied mathematics, English, and Construction units and assignments that follow in this course. This will include -- review of fractions and decimals: converting fractions to higher or lower terms, improper fractions and mixed numbers, common denominators, and adding, subtracting, multiplying, and dividing with decimals and fractions; reading a ruler and a tape measure while incorporating fractional measurements to 1/16 of an inch in a building project; reading a fractional caliper to measure material to desired thicknesses. Students practice the key concepts of general shop safety, learning the specific safety rules for the tooling that is applicable to the task at hand and acquiring the knowledge and skills required to work in a safe environment. Shop safety procedures will include; transporting sharp woodworking tools to prevent injury, shop etiquette as it applies to cleanliness and safety, safe and appropriate use of basic, non-powered hand tools including cross-cut saws, rip saws, pull-saws, coping saws, hammers and chisels, hand planes, sand paper of various grits, etc. Students will take written and practical safety tests that are applicable to each tool demonstrated as well as general shop safety procedures.

B. Furniture Design: After instruction on specific tool safety for each shop tool, students create a furniture design. To prepare them for this, students using their drawing must create the furniture piece. Students are given the materials using the tools of instruction, they demonstrate proper tool safety to the teacher. In order to demonstrate understanding of applied math concepts, students also use geometry tools (i.e., protractor, compass) in order to create shapes in the wood. Ultimately the shapes need to match the given orthographic drawing. While demonstrating, students should also communicate with their instructor, using the vocabulary of the instruction trades, their understanding of how the tools should be used.

Unit 2: **Furniture Structure** *(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, A7.1, A7.2, A7.7
Common Core State Standards: LS 9-10, 11-12.6, SLS 11-12.2, WS 11-12.7, RSTS 11-12.4, RLST 11-12.10, F-TF 1.1, G-C 1, G-GMD 1, 4, 5, G-GPE 5, 7

A. The students will design a structure and develop construction documents for a cabinetry unit. Examples would include kitchen cabinets, bathroom cabinets, or a free standing storage cabinet. The design should include a variety of geometric shapes and should require applied mathematical skills and concepts in order to complete construction. To complete their design, students review specific geometric concepts including understanding the definitions of point, line, line segment, ray, plane, angle, vertex, diameter, radius, and circumference including circular shapes and where other circular shapes fit inside of them. Students apply the area formulas for circles and cylinders and use knowledge of precise measurement of angles using a protractor and angle bisectors using a compass to complete their construction project.

B. Assignments: Building on what they learned creating shed structures, students create a set of construction documents for their furniture structure that should include a front view, side view, top view, materials list and cost, and a written proposal (see below) that identifies the advantages of their design. The drawings must have dimensions in both standard and metric, calculated angles, an accurate and labeled scale, and any other pertinent information. Students should include a variety of geometric shapes in order to challenge their design and layout skills. The final project drawings should have detailed labels and dimensions, stressing the importance of accuracy in design and mathematical calculations. After the documents have been approved by the instructor, the furniture piece will be built.

Unit 3: **Construction Employment History** *(7 weeks)*

STANDARDS
Building and Construction Anchor Standards: 1.0, 2.5, 3.3, 3.4, 3.7, 3.8, 3.9, 5.1, 6.1, 6.11, 7.7, 7.8, 8.1, 8.2, 9.2, 9.3
Building and Construction Pathway Standards: AA3.1, A3.2, A4.3, A8.3, A8.4, A9.6, A10.5,
Common Core State Standards: RSIT 11-12.7, 11-12.10, RHSS 11-12.7, RLST 11-12.2A-REI 10, G-C1, G-GPE 5

A. Students will work collaboratively in teams and respond to a given prompt related to the political, economic, and social conditions that have influenced American labor history and current labor laws. Students will write a research essay, write blog posts and comment on those of peers, and make in-class presentations. Students will learn research, organization, and presentation skills as those skills apply to students showcasing their knowledge of American labor history as well as current labor laws.

B. Assignments: In order to gain a deeper understanding of the historical situations and

issues that have led to the creation of current labor laws, students will research a given era to identify key leaders and major movements, focusing on their influence throughout history. Topics include the significance of apprenticeships, heritage of craft unions and symbols, the progression of working conditions, collective bargaining and economic and social justice.
Presentation: Students present the key findings of their research essay in a 3-5 minute multimedia format (PowerPoints, Prezis, posters, videos, or other platform) and provide an overview of evidence collected including the identification of key leaders and their impact on major labor movements for the given era, a description of the political, economic and social implications of the leaders and movements, and labor law and contemporary application. Presentations are intended to demonstrate a deeper understanding of the labor history movement, demonstrate mastery of research, organizational, and presentation skills, and the effective use of academic language in the oral presentation. Students will present to classmates and a panel of Advisors including teachers, peers, building trades professionals and other community partners as appropriate.

Second Semester-Course Content

Unit 4: **Advanced Construction Techniques** *(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, A7.1, A7.2, A7.7, A9.1, 9.2, 9.3, A9.6, A10.1, A10.4, A10.5, A11.1
Common Core State Standards: RSIT 11-12.2, 11-12.10, RLST 11-12.10, F-TF 1.1, G-C 1, G-GMD 1, 4, 5, G-GPE 5, 7

A. In this unit students will explore numerous building and construction trades and discover their unique aptitudes and specific skill sets as they build wall sections using varied materials, i.e., dimension lumber products, steel stud framing for use by various trades including but not limited to, plumbing, electrical, HVAC, finish carpentry, lath plaster and drywall, framing, glazing, veneers, waterproofing, roofing, sheet metal, concrete etc. Students will use these skills to complete the capstone project. Math skills used will include applied geometry related to the angles of roof pitches, wall angles, finish trim, etc. They will also understand the connection between fractions and decimals and how they relate to the construction process.

B. Assignments:
Capstone Project Preparation: Student will use advanced skills to create dimensioned lumber from rough lumber to use later to complete the capstone project. Math skills used will include applied geometry related to the angles of roof pitches, wall angles, finish trim, etc. They will also understand the connection between fractions and decimals and how they relate to the construction process.

Unit 5: **Capstone Project** *(12 weeks)*

STANDARDS
Building and Construction Anchor Standards:
Building and Construction Pathway Standards: A6.1, A6.2, A6.8, A6.9, A6.10, A6.11, A7.5, A7.6, A7.7, A7.8, A7.10, A 7.11, A8.3, A8.4, A9.2, A9.3, A9.4, A10.1, A10.2, A10.3, A11.1, A11.2
Common Core State Standards: RSIT 11-12.2, 11-12.10, RLST 11-12.2, RLST 11-12.10, A-REI 10, G-C1, G-GPE 5

A. Students will design and build a scaled furniture that encompasses the multiple facets of the building and construction trades. Examples of a capstone project may include a "tiny" home, structure on a trailer, shed, or office space. The interior of the sustainable structure could be a work area or living habitat with finished walls, flooring system, and cabinetry. The sustainable capstone structure requires that a broad variety of the trades be represented and may include skills for rough framing, finish carpentry, machining, assembling and finishing the piece of furniture.

B. Design and Build Furniture:
Students will design and build an original piece of furniture by following these steps:

a) Students will create scale and full sized drawings of furniture and all component parts showing dimension, joinery, fastening and machining elements.

b) Machine, joint, plane, square, laminate, etc. all rough lumber, using advanced construction techniques and equipment.

c) Assemble furniture using proper joinery, gluing and mechanical fastening techniques.

d) Prepare project for finish, filling, sanding, leveling.

e) Finish using advanced finishing techniques; hand rubbed, sprayed, rolled and brushed finishes.