Idaho CTE

Cabinetry and Millwork (2016)

CONTENT STANDARD 1.0: LAB ORGANIZATION AND SAFETY SKILLS 1

1.1 Performance Standard 1.1: General Safety 1.1

- 1.1.1 Describe general shop safety rules, procedures and housekeeping duties. 1.1.1
- 1.1.2. Demonstrate knowledge of OSHA/EPA and their role in workplace safety. 1.1.2.
- 1.1.3. Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities (i.e., personal protection equipment – PPE). 1.1.3.
- 1.1.4. Utilize safe procedures for handling of tools and equipment. 1.1.4.
- 1.1.5. Operate lab equipment according to safety guidelines. 1.1.5.
- 1.1.6. Identify and use proper lifting procedures and proper use of support equipment. 1.1.6.
- 1.1.7. Utilize proper ventilation procedures for working within the lab/shop area 1.1.7.
- 1.1.8. Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment. 1.1.8.
- 1.1.9 Identify the location and use of eye wash stations. 1.1.9
- 1.1.10 Identify the location of the posted evacuation routes. 1.1.10
- 1.1.11 Identify and wear appropriate clothing for lab/shop activities. 1.1.11
- 1.1.12 Secure hair and jewelry for lab/shop activities. 1.1.12
- 1.1.13 Locate and interpret safety data sheets (SDS). 1.1.13
- 1.1.14 Follow written instructions to complete work assignments. 1.1.14
- 1.1.15. Follow written instructions to complete work assignments. 1.1.15.
- 1.1.16. Recommend attendance of OSHA 10-hr safety course 1.1.16.
- 1.1.17 Review worker's rights and responsibilities. 1.1.17

CONTENT STANDARD 2.0: MANUAL AND POWER TOOLS 1.1.18.

2.1 Performance Standard 2.1: Hand Tools 2.1

- 2.1.1 Identify hand tools and their appropriate usage 2.1.1
- 2.1.2 Demonstrate the proper techniques when using hand tools. 2.1.2
- 2.1.3. Demonstrate safe handling and use of appropriate tools. 2.1.3.

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2.1.4 Demonstrate proper cleaning, storage, and maintenance of tools. 2.1.4

2.2 Performance Standard 2.2: Power Tools and Equipment 2.2

2.2.1 Identify power tools and their appropriate usage. 2.2.1

2.2.2 Identify equipment and their appropriate usage. 2.2.2

2.2.3 Demonstrate the proper techniques when using power tools and equipment. 2.2.3

2.2.4 Demonstrate safe handling and use of appropriate power tools and equipment. 2.2.4

2.2.5 Demonstrate proper cleaning, storage, and maintenance of power tools and equipment. 2.2.5

2.2.6 Determine cut speeds and feed rates. 2.2.6

CONTENT STANDARD 3.0: FUNDAMENTAL DESIGN 3

3.1 Performance Standard 3.1: Elements of Design 3.1

3.1.1 Explain the history and characteristics of cabinetry and furniture design styles. 3.1.1

3.1.2 Identify needs and wants in cabinets and furniture in everyday living. 3.1.2

3.1.3 Describe the relationship between the function and form of a cabinet or piece of furniture. 3.1.3

3.1.4 Identify various cabinet styles and components. 3.1.4

3.1.5 Identify common sizes in relation to furniture and cabinets. 3.1.5

3.1.6 Discuss elements of design (e.g., shapes, textures, lines, colors, etc.). 3.1.6

3.1.7 Discuss principles of design (e.g., harmony, symmetry, repetitions, balance, proportion, etc.). 3.1.7

3.1.8 Identify and describe Americans with Disabilities Act (ADA) requirements when applicable 3.1.8

3.1.9 Utilize client requirements and specifications to create a finish product. 3.1.9

3.2 Performance Standard 3.2: Print Reading Techniques 3.2

3.2.1 Interpret basic elements of a working drawing (e.g., annotation, dimensions, line types, etc.). 3.2.1

3.2.2 Identify and define industry standard terminology. 3.2.2

3.2.3 Describe various types of drawings (e.g., working, assembly, pictorial, orthographic, isometric, schematic, etc.). 3.2.3

3.2.4 Understand dimensioning, sectional drawings, fasteners, tables, charts, and assembly drawings. 3.2.4

3.2.5 Develop a materials list from a working drawing. 3.2.5

3.2.6 Develop a construction plan of procedure. 3.2.6

3.2.7 Develop a cut list from a working drawing. 3.2.7

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3.3 Performance Standard 3.3: Measures and Scaling Techniques 3.3

- 3.3.1 Identify industry standard units of measure (e.g., standard, decimal, metric, etc.). 3.3.1
- 3.3.2 Define industry standard measurement terms (e.g., linear, square ft., tolerance, squareness, concentricity, perpendicular, parallel, etc.). 3.3.2
- 3.3.3 Demonstrate proper use of precision measuring tools (e.g., micrometer, dial-indicator, caliper, etc.). 3.3.3
- 3.3.4 Measure to the nearest 1/16th inch with a tape measure. 3.3.4
- 3.3.5 Demonstrate the use of geometric shapes (e.g., arcs, circles, angles, compound angles, tapers, etc.). 3.3.5

3.4 Performance Standard 3.4: Freehand Technical Sketching Techniques 3.4

- 3.4.1 Identify industry standard units of measure (e.g., standard, decimal, metric, etc.). 3.4.1
- 3.4.2 Define industry standard measurement terms (e.g., linear, square ft., tolerance, squareness, concentricity, perpendicular, parallel, etc.). 3.4.2
- 3.4.3 Demonstrate proper use of precision measuring tools (e.g., micrometer, dial-indicator, caliper, etc.). 3.4.3
- 3.4.4 Demonstrate the use of geometric shapes (e.g., arcs, circles, angles, compound angles, tapers, etc.). 3.4.4

3.5 Performance Standard 3.5: Computer Design Technologies 3.5

- 3.5.1 Introduction to current software programs. 3.5.1
- 3.5.2 Design and create a model. 3.5.2
- 3.5.3 Create shop drawings. 3.5.3
- 3.5.4 Modify and adjust standards within a software program. 3.5.4

3.6 Performance Standard 3.6: Mathematical Concepts 3.6

- 3.6.1 Convert between customary and metric systems 3.6.1
- 3.6.2 Identify and convert standards and metric designation. 3.6.2
- 3.6.3 Add, subtract, multiply and divide fractions, decimals, and whole numbers. 3.6.3
- 3.6.4 Convert fractions to decimals. 3.6.4
- 3.6.5 Determine the cost of materials needed for a furniture/cabinetmaking project. 3.6.5

3.7 Performance Standard 3.7: Layout Principles and Practices 3.7

- 3.7.1 Interpret drawing, sketch or specification information. 3.7.1
- 3.7.2 Prepare work area for layout. 3.7.2
- 3.7.3 Select appropriate materials to complete work assignment. 3.7.3

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3.7.4 Use layout and marking tools as required. 3.7.4

3.7.5 Layout parts using measurement practices. 3.7.5

CONTENT STANDARD 4.0: MATERIALS AND HARDWARE 4

4.1 Performance Standard 4.1: Materials 4.1

4.1.1 Identify and describe the major materials and their characteristics used in furniture and cabinetmaking (e.g., hardwood, softwood, composites, laminates, veneers, edge treatment, etc.) 4.1.1

4.1.2 Define material terminology (e.g., air dry, kiln dry, defects, lumber grade, face grades, sanded, etc.) 4.1.2

4.1.3 Differentiate between the various types of material properties and their applications. 4.1.3

4.1.4 Discuss the impact of material usage on the environment. 4.1.4

4.1.5 Discuss the impact of the environment and climate on materials. 4.1.5

4.1.6 Explain how production is affected by the availability, quality, and quantity of resources. 4.1.6

4.1.7 Differentiate between raw materials, standard stock, and finished products. 4.1.7

4.2 Performance Standard 4.2: Fasteners and Methods 4.2

4.2.1 Identify and discuss various fasteners (e.g., type, purpose, application, etc.) 4.2.1

4.2.2 Categorize fastening methods by appropriate applications. 4.2.2

4.2.3 Discuss fastening methods for various materials (e.g., toenailing, countersinking, pocket screws, dowels, biscuits, dominos, etc.) 4.2.3

4.3 Performance Standard 4.3: Adhesives and Methods 4.3

4.3.1 Identify and discuss various adhesives (e.g., glues, contact adhesives, edge bending adhesives, etc.) 4.3.1

4.3.2 List and define common terminology (e.g., open assembly time, closed assembly time, cure time, 1-piece flow, slip, and shelf life, etc.) 4.3.2

4.3.3 Discuss adhesive methods for various materials. 4.3.3

4.3.4 Compare characteristics of adhesives that affect the assembly time, cure time and strength of the product. 4.3.4

4.3.5 Demonstrate the proper cleanup procedures for specific adhesives. 4.3.5

4.4 Performance Standard 4.4: Hardware 4.4

4.4.1 Identify and describe common types of hardware and their applications. 4.4.1

4.4.2 Select the hardware for the appropriate application. 4.4.2

4.4.3 Layout, install, and adjust hardware. 4.4.3

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CONTENT STANDARD 5.0: MANUFACTURING PROCESSES 5

5.1 Performance Standard 5.1: Manufacturing 5.1

- 5.1.1 Identify and describe the current manufacturing processes (e.g., layout, milling, joinery, sanding, assembly, finishing, installation, etc.) 5.1.1

5.2 Performance Standard 5.2: Milling Operations 5.2

- 5.2.1 Identify terms used with milling tools (e.g., kerf, set, grain, drilling, boring, counterboring, countersinking, etc.) 5.2.1
- 5.2.2 Select the proper milling tools for specific operations (e.g., table saw, drill press, joiner, lathe, band saw, jigsaw, routers, etc.) 5.2.2
- 5.2.3 Demonstrate the steps to square a board. 5.2.3
- 5.2.4 Demonstrate cutting and handling techniques used for lumber and sheet goods. 5.2.4
- 5.2.5 Demonstrate the use of a jig, template, and fixture. 5.2.5
- 5.2.6 Demonstrate safety operating procedures, (e.g. feather boards, holders, and power feeders). 5.2.6
- 5.2.7 Identify terms used with milling tools (e.g., kerf, set, grain, drilling, boring, counterboring, countersinking, etc.) 5.2.7

5.3 Performance Standard 5.3: Computer Numerical Control (CNC) 5.3

- 5.3.1 Discuss the applications of CNCs and CNC technology. 5.3.1
- 5.3.2 Understand the programming and set up of CNCs. 5.3.2
- 5.3.3 Discuss the outcomes of appropriate G codes/M codes. 5.3.3
- 5.3.4 Discuss troubleshooting methods 5.3.4
- 5.3.5 Advantages and disadvantages of using CNCs. 5.3.5

5.4 Performance Standard 5.4: Joinery Techniques 5.4

- 5.4.1 Identify terms used with joinery techniques (e.g., doweling, biscuits, floating tenon, tongue & groove, dados, miter, dovetail, etc.). 5.4.1
- 5.4.2 Determine the appropriate joinery applications 5.4.2
- 5.4.3 Discuss the advantages and disadvantages of joinery types. 5.4.3
- 5.4.4 Select the proper joinery tools and machinery for specific operations. 5.4.4
- 5.4.5 Construct various joints (i.e., dado, miter, rabbet, butt). 5.4.5

5.5 Performance Standard 5.5: Sanding 5.5

- 5.5.1 Identify terms used with sanding processes and techniques (e.g., grit, belt, disc, hand, etc.) 5.5.1
- 5.5.2 Properly prepare a surface for a treatment or finish. 5.5.2
- 5.5.3 Demonstrate proper application methods for different types of filler materials. 5.5.3

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5.5.4 Select the proper tool and abrasive for shaping and smoothing materials. 5.5.4

5.5.5 Select the proper grit sizes and sequences for shaping and smoothing operations. 5.5.5

5.5.6 Utilize the proper health and safety procedures when working with abrasives and fillers 5.5.6

5.6 Performance Standard 5.6: Assembly 5.6

5.6.1 Identify terms used with assembly procedures (e.g., dry fitting, clamping, gluing, etc.) 5.6.1

5.6.2 Select the proper assembly tools for specific operations (e.g., c-clamps, bar clamps, pipe clamps, etc.) 5.6.2

5.6.3 Demonstrate assembly and clamping procedures. 5.6.3

5.6.4 Demonstrate common case construction techniques (e.g., face frame, frameless, etc.) 5.6.4

5.6.5 Demonstrate common frame and panel construction techniques (e.g., stile, rail, panel, etc.) 5.6.5

5.6.6 Demonstrate furniture construction techniques. 5.6.6

5.6.7 Construct a project that includes a drawer and a door. 5.6.7

5.6.8 Use specific quality control criteria to check the accuracy and squareness of a project. 5.6.8

5.6.9 Demonstrate laminating techniques (e.g., plastic, veneers, edge treatment, etc.) 5.6.9

5.6.10 Demonstrate molding and trim usage and installation 5.6.10

5.7 Performance Standard 5.7: Finishing 5.7

5.7.1 Identify terms and products used in finishing procedures (e.g., staining, clear coating, penetrating oils, sheen, sealer, etc.) 5.7.1

5.7.2 Select the proper finishing tools and materials for specific operations. 5.7.2

5.7.3 Demonstrate proper application methods for different types of finishes. 5.7.3

5.7.4 Demonstrate clean up procedures for various types of finishing products and equipment. 5.7.4

5.7.5 Utilize the proper health and safety procedures when working with finishes. 5.7.5

5.8 Performance Standard 5.8: Installation 5.8

5.8.1 Discuss cabinet layout and installation techniques. 5.8.1

5.8.2 Discuss countertop layout, materials, and installation techniques. 5.8.2

5.8.3 Check walls and floors for level and plumb. 5.8.3

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5.8.4 Determine fasteners for walls. 5.8.4

5.8.5 Install upper and lower cabinets and other casework. 5.8.5

5.8.6 Install countertops, including sink cutouts and back splash. 5.8.6

5.8.7 Cut and install molding and trim. 5.8.7

5.8.8 Adjust doors and drawers. 5.8.8

5.8.9 Clean work site. 5.8.9

6.1 Performance Standard 6.1: Career Exploration 6.1

6.1.1 Discuss the employment opportunities in the industry. 6.1.1

6.1.2 Discuss economic impacts within the industry. 6.1.2

6.1.3 Create an employment application and resume. 6.1.3

6.1.4 Explore education and training for careers in the industry. 6.1.4

Standard