

STRANDS AND STANDARDS

CABINETMAKING



Course Description

The third instructional course in a sequence of courses that prepares individuals to apply technical knowledge and skills, set up and operate industrial woodworking machinery, and use such machinery to design and fabricate custom cabinets and architectural millwork. It stresses the safe use of trade hand and power tools and machinery used in the production of millwork items. Cabinets, such as kitchen and vanities are constructed, finished, and installed as part of this program.

Intended Grade Level	10-12
Units of Credit	0.5
Core Code	40.10.00.00.020
Concurrent Enrollment Core Code	40.10.00.13.020
Prerequisite	Woodworking
Skill Certification Test Number	524
Test Weight	0.5
License Type	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Cabinetmaking/Millwork
Endorsement 2	N/A
Endorsement 3	N/A

STRAND 1

Students will understand cabinetmaking, manufacturing, installation, and theory.

Standard 1

Understand the cabinetmaking industry.

- Identify career opportunities in cabinetmaking/millwork manufacturing.
- Identify career opportunities using career pathways in related millwork industries.
- Describe the integration of cabinetmaking into construction schedules.

Standard 2

Understand the design, planning, and estimation process.

- Identify principles of design as they apply to kitchen layout.
 - U-shape
 - Peninsula
 - Corridor
 - L-shape
 - Work triangle
- Draw the necessary views of a selected project.
- Create a material list for the selected project and determine the project cost.
- Follow a procedure list for construction of a cabinet.
- Extract pertinent cabinet information and specifications from a set of house plans.
- Identify cabinet standards related to kitchen, vanity, and commercial type cabinets (quality standards, dimension standards, etc.).

Standard 3

Understand and demonstrate basic math and measuring concepts.

- Calculate the cost of a project.
- Demonstrate the optimization of materials.
- Demonstrate basic woodworking math proficiency.
- Multiply two-digit numbers.
- Calculate board feet and square feet.
- Read and measure with a tape using sixteenths (1/16).

Performance Skill

Understand cabinetmaking, manufacturing, installation, and theory.

- Understand the cabinetmaking industry.
- Understand the design, planning, and estimation process.
- Understand and demonstrate basic math and measuring concepts.

STRAND 2

Students will understand and demonstrate the safe use of cabinetmaking tools.

Standard 1

Understand and demonstrate the safe use of hand tools.

- Describe the purpose and demonstrate the proper use of the following measuring and layout tools:
 - Measuring tape
 - Caliper (digital or dial)
 - Scratch awl
 - Framing square
 - Combination square
 - Try square
 - Sliding T-bevel
 - Stud finder
 - Scribe
- Describe the purpose and demonstrate the proper use of the following cutting and shaping tools:
 - Hand planes (block, smooth, jack)
 - Wood chisel
 - Wood file/rasp
 - Hand saw
 - Glue scraper
 - Putty knife
 - Card scraper
- Describe the purpose and demonstrate the proper use of the following striking tools:
 - Claw hammer
 - Nail set
 - Dead-blow hammer
- Describe the purpose and demonstrate the proper use of the following drill bits:
 - Twist
 - Spade
 - Countersink
 - Driver bits: Phillips, Square, Flat
 - Centering bit (Vix bit)
 - Hole saw
 - Multi-spur bit

Standard 2

Understand and demonstrate the safe use of portable power tools.

- Describe the purpose and demonstrate the proper use of the following portable power tools:
 - Pneumatic/power nail gun
 - Power drills
 - Impact driver
 - Router
 - Finish sander
 - Belt sander
 - Orbital sander
 - Biscuit jointer
 - Hand jig saw
 - Reciprocal saw

Standard 3

Understand and demonstrate the safe use of power machines.

- Describe the purpose and demonstrate the proper use of the following sawing machines:
 - Table saw
 - Power miter saw
 - Band saw
- Describe the purpose and demonstrate the proper use of the following surfacing machines:
 - Surface planer
 - Jointer
- Describe the purpose and demonstrate the proper use of the following sanding machines:
 - Disc sander
 - Wide belt sander
 - Spindle sander
 - Edge sander
- Describe the purpose and demonstrate the proper use of the following shaping machines:
 - Router table
 - Shaper
 - CNC machine
 - Lathe
- Describe the purpose and demonstrate the proper use of the following drilling machines:
 - Drill press
 - Line boring machine

Standard 4

Understand wood products, characteristics, and procedures.

- Describe the parts of a tree and the significance that it has in cabinet construction.
 - Bark
 - Sap wood
 - Pith
 - Annual (growth) rings
 - Lignin
- Describe and identify natural defects.
 - Warp (cut, twist, bow, cook)
 - Cracks
 - Bark inclusions
 - Knots
- Understand the methods of the seasoning and drying lumber.
 - Standard moisture content levels for kiln and air dried lumber.
 - The effects of moisture on materials (expansion and contraction).
- Distinguish between softwoods and hardwoods.
- Identify the difference between solid wood and manufactured materials and describe the use of each.
- Identify wood species and their specific characteristics.

Alder	Walnut	Pine
Cherry	Maple	Mahogany
Oak	Poplar	Red Cedar
- Identify common manufactured wood products.
 - Plywood
 - Particle board
 - MDF
 - Baltic Birch
 - Melamine
 - Plastic laminate
- Identify common grades of lumber and sheet goods.
 - FAS
 - Select
 - #1COM

Performance Skill

Understand and demonstrate the safe use of cabinetmaking tools.

- Understand and demonstrate the safe use of hand tools.
- Understand and demonstrate the safe use of portable power tools.
- Understand and demonstrate the safe use of power machines.
- Understand wood products, characteristics, and procedures.

STRAND 3

Students will understand milling and assembly.

Standard 1

Understand and demonstrate the use of joinery.

- Identify the basic woodworking joints.

Butt	Dovetail
Miter	Groove (plough)
Rabbet	Pocket
Dado	Blind dado
- Construct the basic wood joints used in cabinetmaking.

Standard 2

Understand and demonstrate the use of cabinet components and hardware.

- Identify the cabinet components of a face frame and cabinet box.

Stile	Skin	Molding
Rail	Shelf	Filter strip
Mullion	Web frame	Edge banding
Base	Kicker	Bottom
Toe kick	Drawer runner/glide	Back
Side	Nailer	
- Identify the door options in cabinetmaking.
- Identify the components of a drawer.
- Identify and properly install common cabinet/furniture hardware such as:
 - Hinges - offset, overlay, European, butt
 - Drawer guides
 - Pulls and knobs
 - Shelf supports
- Assemble a cabinet with the proper adhesive and fasteners.
- Layout and construct cabinet doors.
- Cut out and construct drawers.
- Install door and drawer.
- Identify basic construction methods.
 - Frame and panel
 - Casework construction
 - Face frame
 - European 32mm

Standard 3

Understand and demonstrate finishing, installation, and transportation techniques.

- Understand and properly apply the basic rules of sanding.
- Select and correctly use each specified grit size.
- Properly prepare a surface for finishing.

- Properly apply stain, penetrating oil, and/or a clear finish.
- Properly spray a clear coat.
- Understand basic cabinet installation techniques such as scribing, leveling, and shimming.

Performance Skill

Understand milling and assembly.

- Understand and demonstrate the use of joinery.
- Understand and demonstrate the use of cabinet components and hardware.
- Understand and demonstrate finishing, installation, and transportation techniques.

STRAND 4

Students will be able to perform automated manufacturing processes using CNC equipment.

Standard 1

Understand X, Y, Z axis.

Standard 2

Understand vector lines.

Standard 3

Define G-code.

Standard 4

Define 2D, 2.5D, and 3D.

Standard 5

Understand post-processor.

Standard 6

Create a tool path and use a CNC machine to make a cut.

Standard 7

Define vector and raster.

Performance Skill

Perform automated manufacturing processes using CNC equipment.

- Understand X, Y, Z axis.
- Understand vector lines.
- Define G-code.
- Define 2D, 2.5D, and 3D.
- Understand post-processor.
- Create a tool path and use a CNC machine to make a cut.
- Define vector and raster.

STRAND 5

Students will understand the importance of career readiness skills as it relates to the workplace and outlined in the SkillsUSA Framework – Level 2.

Standard 1

Understand and demonstrate reliability.

- Determine individual time management skills.
- Explore what's ethical in the workplace or school.
- Demonstrate awareness of government.
- Demonstrate awareness of professional organizations and trade unions.

Standard 2

Understand and demonstrate responsiveness.

- Define the customer.
- Recognize benefits of doing a community service project.
- Demonstrate social etiquette.
- Identify customer expectations.

Standard 3

Understand resiliency.

- Discover self-motivation techniques and establish short-term goals.
- Select characters of a positive image.
- Identify a mentor.

Standard 4

Understand and demonstrate workplace habits.

- Participate in a shadowing activity.
- Explore workplace ethics: codes of conduct.
- Recognize safety issues.
- Perform a skill demonstration.
- Exercise your right to know.

Standard 5

Understand and develop initiative.

- Develop personal financial skills.
- Develop a business plan.
- Investigate entrepreneurship opportunities.

Standard 6

Understand and demonstrate continuous improvement.

- Conduct a worker interview.
- Demonstrate evaluation skills.
- Examine ethics and values in the workplace.
- Develop a working relationship with a mentor.
- Construct a job search network.

Skill Certificate Test Points by Strand

Test Name	Test #	Number of Test Points by Strand					Total Points	Total Questions
		1	2	3	4	5		
Cabinetmaking	524	16	31	20	5	2	74	72