Lesson Plans for Module 27501-15

CABINETMAKING

Module 27501-15 introduces advanced trainees and experienced carpenters to the construction of high-quality finished products such as cabinets and furniture. Many companies build and install custom cabinets designed to fit into a specific area or serve a particular need. Custom cabinets are common in both residential and commercial construction. Custom entertainment centers, bookcases, and kitchen cabinets are all examples of work done by cabinetmakers. Like trim carpentry, this craft requires great precision, attention to detail, an eye for design, and the ability to use a variety of specialized tools that are unique to cabinet fabrication and construction.

Objectives

Learning Objective 1

- Identify and describe the types of wood commonly used to construct cabinets.
  a. Identify and describe solid woods.
  b. Identify and describe various types of plywood.
  c. Identify and describe particleboard.

Learning Objective 2

- Identify and describe the safe use of various cabinetmaking power tools.
  a. Identify and describe the safe use of various types of saws.
  b. Identify and describe the safe use of jointers, planers, shapers, and routers.
  c. Identify and describe the safe use of sanders, drill presses, and brad guns.

Learning Objective 3

- Identify and describe joints and other construction features of cabinet components and their related hardware and fasteners.
  a. Identify and describe the common wood joints used in cabinetmaking.
  b. Identify and describe the construction features of cabinet doors, drawers, and shelves.
  c. Identify and describe various types of cabinet hardware and fasteners.

Learning Objective 4

- Describe how to assemble, sand, and finish cabinets.
  a. Describe the process of cabinet assembly.
  b. Describe how to properly sand cabinets.
  c. Describe how to apply sealers, wood fillers, and stains.

Learning Objective 5

- Describe how to prepare and apply laminate to a countertop.
  a. Identify basic considerations for laminate installation.
  b. Describe how to lay out and cut laminates.
  c. Describe how to apply laminate to a countertop.

Performance Tasks

Performance Task 1

(Learning Objectives 2 and 3)

- Use power tools to make joints commonly used by cabinetmakers.

Performance Task 2

(Learning Objectives 2, 3, and 4)

- Build a cabinet from a set of drawings.

Performance Task 3

(Learning Objective 5)

- Install plastic laminate on a countertop core.

Teaching Time: 35 Hours

(Fourteen 2.5-hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites

Core Curriculum; Carpentry Levels One and Two.

Before You Begin

As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the accompanying PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the written examinations and Performance Profile sheets from **www.nccerirc.com**. The passing score for submission into NCCER's Registry is 70% or above for the written examination; all Performance Tasks are graded pass or fail.

Safety Considerations

This module requires that trainees work with and around numerous power tools and equipment capable of causing serious personal injury. Safety must be emphasized at all times. Trainees should be carefully observed to ensure that they wear the proper PPE, follow safe practices, and give due respect to unseen hazards related to power tools and the cabinet-shop environment. Any deficiencies must be corrected to ensure the future safety of all trainees. All practice sessions and Performance Tasks must be completed under your direct supervision.

Classroom Equipment and Materials

- Whiteboard
- Dry-erase markers
  - (a variety of standard marker sizes)
- Pencils and paper
- Poster board
- Flip chart
- LCD projector and screen
- Computer (Internet access optional)
- Samples of various hardwoods
- Samples of plywood with different core types
- Samples of particleboard, MDF, and melamine
- A variety of sandpapers with different abrasives and grit values
- Module Review answer key
- Copies of the Module Examination and answer key
- Performance Profile sheets
- The following tools are optional for classroom sessions:
  - Table saw
  - Radial arm saw
  - Compound miter saw
  - Jointer
  - Planer
  - Shaper
  - Router and router table
  - Drum sander
  - Belt-disc sander
  - Belt and pad sanders
  - Drill press
  - Brad gun
  - Biscuit joiner and biscuits

Laboratory Equipment and Materials

- Minimum Safety Equipment:
  - Safety glasses
  - Face shields
  - Work gloves
  - The following items as directed by the instructor or training facility provider:
    - Respiratory protection
    - Proper footwear
    - Hearing protection
    - Hard hat
- Table saw with both cutting and dado blade sets
- Radial arm saw
- Compound miter saw
- Scroll or band saw
- Jointer-planer
- Thickness planer
- Shaper with assorted cutting blades
- Router with assorted bits
- Router table
- Laminate trimmer (or appropriate router bit)
- Drum sander
- Disc sander
- Belt sander
- Random-orbit sander
- Appropriate abrasives and sandpaper for all sanding equipment
- Drill press and assorted bits
- Brad gun and brads
- Biscuit joiner
- Biscuits and dowels
- Squares
- Level
- Block plane
- Assortment of clamps
- Wood files and/or rasps
- Tape measures and steel rulers
- J-rollers
- Paint rollers and/or brushes for applying contact cement
- Contact cement
- Wood glue
- Wood sealers
- Wood filler
- Various wood stains
- Finish coat products, such as varnish or polyurethane
- Brushes and rags for applying finishes
- Assortment screws and similar assembly hardware
- Appropriate scrap lumber for joint-fabrication demonstration and trainee practice
- Countertop base and backsplash
- Sufficient laminate material to cover the countertop base

Additional Resources

This module presents thorough resources for task training. The following resource material is suggested for further study.

Wood Handbook: Wood as an Engineering Material. General Technical Report FPL-GTR-190. Madison, WI: Forest Products Laboratory, United States Department of Agriculture.

Building Kitchen Cabinets. 2003. Udo Schmidt. Newton, CT: Taunton Press.

The Complete Kitchen Cabinetmaker. 2014. Robert W. Lang. East Petersburg, PA: Fox Chapel Publishing.

Understanding Wood Finishing: How to Select and Apply the Right Finish. 2010. Bob Flexner. East Petersburg, PA: Fox Chapel Publishing.

American Plywood Association. **www.apawood.org**. Last accessed June 24, 2015.

Hardwood Plywood and Veneer Association. **www.hpva.org**. Last accessed June 24, 2015.

The Wood Database. **www.wood-database.com**. Last accessed June 24, 2015.

Jet Power Tools. **www.jettools.com**. Last accessed June 27, 2015.

Porter Cable. **www.portercable.com**. Last accessed June 27, 2015.

CPO Powermatic. **www.cpopowermatic.com**. Last accessed June 27, 2015.

SawStop™ Table Saws. **www.sawstop.com**. Last accessed June 27, 2015.

Rockler Woodworking and Hardware. **www.rockler.com**. Last accessed June 28, 2015.

Kreg Enterprises, Inc. **www.kregtool.com**. Last accessed June 28, 2015.

General Finishes. **www.generalfinishes.com**. Last accessed September 2, 2015.

Wilsonart LLC. **www.wilsonart.com**. Last accessed June 28, 2015.

There are a number of online resources available for trainees who would like more information on cabinetmaking and related finish carpentry skills. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Numerous videos related to the topic are available on the Internet. These can be located by searching “custom cabinets”, “cabinetmaking”, or similar terms and using the Video tab on the results page of your preferred search engine.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take still pictures related to the subject matter and add them to the presentations throughout the program.

Session Outline for 27501-15

Cabinetmaking

The lesson plan for this module is divided into fourteen 2.5-hour sessions.
Each session includes 10 minutes for administrative tasks and one 10-minute break.

Session One

Session One introduces trainees to a wide variety of cabinet woods. The session concludes with an introduction to shop saws. This session covers Sections 1.0.0 through 2.1.3.

1. Open the Session One presentation.
2. Use the Kickoff Activity to encourage discussion and learn more about the trainees.
3. Introduce hardwoods and softwoods used in cabinetmaking.
4. Review plywood construction and the use of particleboard.
5. Open the topic of shop power tools with an introduction to shop saws.
6. Use the Section Review questions to review the topics of this session.

Session Two

Session Two presents the remaining power tools to be covered in this module and introduces trainees to common wood joints used in cabinetmaking. This session covers Sections 2.2.0 through 3.1.11.

1. Open the Session Two presentation.
2. Use the Kickoff Activity to introduce trainees to the jointer and its proper adjustment.
3. Identify and describe jointer-planers, thickness planers, shapers, and routers.
4. Identify and describe sanders, drill presses, and brad guns.
5. Introduce a variety of wood joints used in cabinetmaking.
6. Use the Section Review questions to review the topics of this session.

Session Three

Session Three presents the components of cabinets as well as the necessary hardware. The session concludes with a discussion of cabinet assembly and finishing processes. This session covers Sections 3.2.0 through 4.3.3.

1. Open the Session Three presentation.
2. Use the Kickoff Activity to introduce trainees to the extensive variety of cabinet pulls, knobs, and related hardware available on the market.
3. Review the construction details of cabinet doors, drawers, and shelves.
4. Identify and describe different types of hinges, catches, knobs, pulls, and fasteners.
5. Review the steps in cabinet assembly.
6. Discuss the application of sealers, wood fillers, stains, and finish coatings.
7. Use the Section Review questions to review the topics of this session.

Session Four

Session Four reviews the process of installing countertop laminates. In addition, this session includes a review of the complete module and the module exam is administered. This session covers Sections 5.0.0. through 5.3.2.

1. Open the Session Four presentation.
2. Use the Kickoff Activity to introduce the installation of laminates through a video presentation.
3. Review the process of cutting and applying laminates.
4. Use the Section Review questions to review the topics of this session.
5. Go over the Module Review to prepare trainees for the module exam.
6. Administer the module exam. Record the testing results on the Registration of Training Modules form and submit the form to your Training Program Sponsor.

SESSIONS FIVE THROUGH FOURTEEN

Sessions Five through Fourteen are laboratory sessions that provide an opportunity for trainees to practice and complete the Performance Tasks associated with this module.

1. Note that no slide presentation is associated with these laboratory sessions.
2. Demonstrate how to use a variety of power tools.
3. Demonstrate how to create common wood joints using power tools.
4. Provide trainees with a set of plans to build a cabinet and review the details of its construction.
5. Under your supervision, have trainees practice and complete the requirements of Performance Tasks 1 and 2.
6. Coach trainees through the installation of a laminate on a countertop base.
7. Under your supervision, have trainees practice and complete the requirements of Performance Task 3.
8. Document successful Performance Task completions for each trainee on the Performance Profile sheet and submit the results to the Training Program Sponsor.

Materials Checklist for Module 27501-15, Cabinetmaking

Equipment and Materials					
Personal protective equipment:		Table saw with both cutting and dado blade sets		J-rollers	
Safety glasses		Radial arm saw		Paint rollers and/or brushes for applying contact cement	
Face shields		Compound miter saw		Contact cement	
Work gloves		Scroll or band saw		Wood glue	
The following items as directed by the instructor or training facility provider:		Jointer-planer		Wood sealers	
Respiratory protection		Thickness planer		Wood filler	
Proper footwear		Shaper with assorted cutting blades		Various wood stains	
Hearing protection		Router with assorted bits		Finish coat products, such as varnish or polyurethane	
Hard hat		Router table		Brushes and rags for applying finishes	
Whiteboard		Laminate trimmer (or appropriate router bit)		Assortment screws and similar assembly hardware	
Dry-erase markers		Drum sander		Appropriate scrap lumber for joint-fabrication demonstration and trainee practice	
Pencils and paper		Disc sander		Countertop base and backsplash	
Poster board		Belt sander		Sufficient laminate material to cover the countertop base	
Flip chart		Random-orbit sander		Tools for classroom sessions (*optional*):	
LCD projector and screen		Appropriate abrasives and sand-paper for all sanding equipment		Table saw	
Cabinetmaking PowerPoint® Presentation Slides		Drill press and assorted bits		Radial arm saw	
Computer (Internet access optional)		Brad gun and brads		Compound miter saw	
Module Review answer key		Biscuit joiner		Jointer, planer, shaper	
Copies of the Module Examination and answer key		Biscuits and dowels		Router and router table	
Performance Profile sheets		Squares		Drum sander	
Samples of various hardwoods		Level		Belt-disc sander	
Samples of plywood with different core types		Block plane		Belt and pad sanders	
Samples of particleboard, MDF, and melamine		Assortment of clamps		Drill press	
Variety of sandpapers with different abrasives and grit values		Wood files and/or rasps		Brad gun	
		Tape measures and steel rulers		Biscuit joiner and biscuits	

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.