

Lesson Plans for Module 27501

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

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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.



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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 (<i>optional</i>):
LCD projector and screen		Appropriate abrasives and sandpaper for all sanding equipment	Table saw
<i>Cabinetmaking PowerPoint®</i> 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.