



CABINETMAKING/MILLWORK

Furniture Design & Manufacturing

The second instructional course in a sequence that prepares individuals to apply technical knowledge and skills to prepare and execute furniture design projects; assemble and finish furniture articles; repair furniture; and stresses the safe use a variety of hand and power tools and machinery. Recommended projects would be anything that would allow students to incorporate all joints and tools e.g. a chest of drawers.

USOE
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Furniture Design & Manufacturing

Levels:	Grades 10-12
Units of Credit:	Minimum 0.5
CIP Code:	48.0702
11 Digit Code:	40-10-00-00-130
11 Digit DE Code:	40-10-00-13-130
Test #:	522
License:	CTE/Secondary
Endorsement:	Cabinetmaking/Millwork
Prerequisite:	Woodworking

CORE STANDARDS, OBJECTIVES, AND INDICATORS

STANDARD
480702-01 **Students will be able to understand the furniture making industry.**

OBJECTIVES

480702-0101 Identify career opportunities in the furniture and cabinetmaking industries.

STANDARD
480702-02 **Students will be able to understand the design, planning and estimation process.**

OBJECTIVES

480702-0201 Identify elements and principles of design as they apply to woodworking and cabinetmaking/millwork manufacturing.

480702-0202 Identify standard furniture dimensions relating to tables, seating, bookshelves, and shelving.

480702-0203 Draw the necessary views of a selected project.

480702-0204 Create a material list for the selected project and determine the project cost.

480702-0205 Create a procedure list for construction of a cabinet.

480702-0206 Extract pertinent cabinet information and specifications from working drawings and specifications.

STANDARD
480702-03 **Students will be able to understand and demonstrate safe practices.**

OBJECTIVES

480702-0301 Demonstrate the ability to work safely in a wood shop following general safety rules.

480702-0302 Demonstrate the safe use of woodworking tools and machines.

- 480702-0303 Demonstrate how to handle, store, and dispose of materials according to MSDS sheets.
- 480702-0304 Pass a written safety test with a score of 100 percent.

STANDARD 480702-04 Students will be able to understand and demonstrate the safe use of hand tools.

OBJECTIVES

480703-0401 Describe the purpose and demonstrate the proper use of the following measuring and layout tools:

Measuring tape	Scratch awl
Combination square	Try square
Framing square	Sliding T-bevel
Tammel points	Compass

480703-0402 Describe the purpose and demonstrate the proper use of the following cutting and shaping tools:

Utility knife	Back saw
Block plane	Wood chisel
Wood file/rasp	Hand saw
Jack plane	Glue scraper
Putty knife	

480703-0403 Describe the purpose and demonstrate the proper use of the following striking tools:

Claw hammer	Dead-blow hammer
Rubber mallet	Nail set

480703-0404 Describe the purpose and demonstrate the proper use of the following drill bits:

Twist	Forstner
Spade	Countersink
Driver bits: Phillips, Square, slotted	Hole saw
Multi spur bit	Hogging tool

STANDARD 480702-05 Students will be able to understand and demonstrate the safe use of portable power tools.

OBJECTIVES

480703-0501 Describe the purpose and demonstrate the proper use of the following portable power tools:

Pneumatic nailer	Power drills	Router
Finish sander	Belt sander	Orbital sander
Biscuit jointer	Hand jig saw	

STANDARD 480702-06 Students will be able to understand and demonstrate the safe use of power machines.

OBJECTIVES

- 480701-0601 Describe the purpose and demonstrate the proper use of the following sawing machines:
Table saw Power Miter Saw Radial arm saw
Band saw
- 480701-0602 Describe the purpose and demonstrate the proper use of the following surfacing machines:
Surface planer Jointer
- 480701-0603 Describe the purpose and demonstrate the proper use of the following sanding machines:
Disc sander Surface sander Spindle sander
- 480701-0604 Describe the purpose and demonstrate the proper use of the following shaping machines:
Router table Shaper
- 480701-0605 Describe the purpose and demonstrate the proper use of the following drilling and turning machines:
Drill press Line boring machine Lathe

STANDARD **Students will be able to understand wood products, characteristics, and procedures.**
480702-07

OBJECTIVES

- 480702-0701 Describe the parts of a tree and the significance that it has in cabinet construction.
▪ Bark
▪ Sap wood
▪ Pith
▪ Annual (growth) rings
- 480702-0702 Describe and know how natural defects.
▪ Warp
▪ Cracks
▪ Bark inclusions
▪ Knots
- 480702-0703 Demonstrate a knowledge of the seasoning and drying of lumber.
- 480702-0704 Distinguish between softwoods and hardwoods.
- 480702-0705 Identify the difference between solid wood and manmade goods and describe the use of each.
- 480702-0706 Identify wood species and list the species most suited for furniture construction.
▪ Alder
▪ Cherry
▪ Oak
▪ Walnut
▪ Maple
▪ Poplar

- Pine
 - Mahogany
 - Cedar
- 480702-0707 Identify the common grades of lumber and sheet goods.
- FAS
 - Select
 - #1COM
- 480702-0708 Properly store material.

**STANDARD
480702-08** **Students will be able to understand and demonstrate basic math and measuring concepts.**

OBJECTIVES

- 480701-0801 Add two- and three-digit numbers.
- 480701-0802 Subtract two-, three-, and four-digit numbers.
- 480701-0803 Solve two-digit divisor numbers.
- 480701-0804 Multiply a two-digit factor.
- 480701-0805 Add, subtract, multiply, and divide fractions and mixed numbers.
- 480701-0806 Convert fractions to decimals.
- 480701-0807 Reduce fractions.
- 480701-0808 Add, subtract, multiply, and divide decimal numbers.
- 480701-0809 Calculate percentages and basic ratios.
- 480701-0810 Add and subtract linear measurement in feet and inches.
- 480701-0811 Use a ruler or measuring tape to measure within a sixteenth (1/16) of an inch.
- 480702-0812 Calculate board feet and square feet.
- 480702-0813 Demonstrate the optimization of materials.

**STANDARD
480702-09** **Students will be able to understand and demonstrate the use of fasteners and adhesives.**

OBJECTIVES

- 480701-0901 Identify the various woodworking fasteners and the application of each.
- Nails
 - Screws
 - Staples
 - Pins
 - Bolts
- 480702-0902 Identify the different adhesives and preferred use of each.
- Yellow glue
 - Polyurethane glue
 - Cyanoacrylate
 - Epoxy

480701-0903 Identify the different types of clamps.

- Bar
- “C”
- Spring
- Band
- Handscrew.

STANDARD
480702-10 **Students will be able to understand and demonstrate the use of joinery.**

OBJECTIVES

480702-1001 Identify the basic wood joints used in furniture making.

- Butt
- Miter
- Rabbet
- Dado
- Spline
- Mortise and tenon
- Dovetail
- Groove (plough)
- Lap
- Pocket
- Dowel
- Biscuit
- Blind dado

480702-1002 Construct the basic wood joints used in cabinetmaking/millwork.

STANDARD
480702-11 **Students will be able to understand and demonstrate the use of cabinet components and hardware.**

OBJECTIVES

480702-1101 Identify the cabinet components of a face frame and cabinet box.

- Stile
- Rail
- Mullion
- Side
- Skin
- Base
- Shelf
- Web frame
- Kicker
- Drawer runner/glide
- Toe kick
- Back

- 480702-1102 Describe the concept of a European (frameless) cabinet system and the advantages and disadvantages of that system.
- 480702-1103 Identify the door options in cabinetmaking:
- Flush
 - Overlay
 - Lip
 - Tambour
- 480702-1104 Identify the components of a drawer.
- 480702-1105 Identify and properly install common cabinet/furniture hardware such as:
- Hinges - offset, overlay, European, butt, lip
 - Drawer guides,
 - Pulls and knobs,
 - Shelf supports.
- 480702-1106 Assemble a project with the proper adhesive and fasteners.
- 480702-1107 Use frame and panel construction in a project .
- 480702-1108 Construct a drawer.
- 480702-1109 Install lid or door and drawer.
- 480702-1110 Identify basic construction methods.
- Frame and panel
 - Casework construction
 - Post and rail

STANDARD
480702-12 **Students will be able to understand and demonstrate finishing techniques.**

OBJECTIVES

- 480703-1201 Understand and properly apply the basic rules of sanding
- 480702-1202 Select and correctly use each specified grit size.
- 480702-1203 Properly prepare a surface for finishing.
- 480702-1204 Properly apply stain, penetrating oil, and/or a clear finish
- 480702-1205 Properly spray a clear coat.

PROFESSIONAL DEVELOPMENT

STANDARD
480702-13 **Students will understand the need for professional development.**

OBJECTIVES

- 480702-1301 Complete a personal inventory.
- 480702-1302 Set and meet goals.
- 480702-1303 Be self-motivated.
- 480702-1304 Know how to make decisions.
- 480702-1305 Know how to manage time.
- 480702-1306 Organize personal belongings and lab equipment.
- 480702-1307 Learn to communicate verbally.

- 480702-1308 Write effective communications.
 480702-1309 Establish a personal reading program.
 480702-1310 Develop effective work skills and attitudes.
 480702-1311 *Master a working knowledge of SkillsUSA.
- Learn the acronym SkillsUSA.
 - State the SkillsUSA motto.
 - State the SkillsUSA creed.
 - Learn the SkillsUSA colors.
 - Describe the official SkillsUSA dress.
 - Describe the procedure for becoming a SkillsUSA officer.

STANDARD
480702-14 **Students will understand the need for leadership skills.**

OBJECTIVES

- 480702-1401 Serve on a committee.
 480702-1402 Prepare an agenda.
 480702-1403 Assist in planning a meeting.
 480702-1404 Review basic parliamentary procedure.
- Make a main motion.
- 480702-1405 Participate in a school project.
 480702-1406 Attend a community meeting.
 480702-1407 Practice effective speaking.
 480702-1408 Present a three- to five-minute talk.
 480702-1409 Implement a leadership project.
 480702-1410 *Master a working knowledge of SkillsUSA.
- Describe the meaning of the SkillsUSA emblem.
 - State the SkillsUSA pledge.
 - Describe the duties of a SkillsUSA officer.

STANDARD
480702-15 **Students will understand the need for career planning.**

OBJECTIVES

- 480702-1501 Define your future occupation.
 480702-1502 Survey employment opportunities.
 480702-1503 Report on a trade journal article.
 480702-1504 Explore opportunities for advanced training.
 480702-1505 Conduct a worker interview.
 480702-1506 Contact a professional association.
 480702-1507 Explore entrepreneurship opportunities.
 480702-1508 Give a talk about your career.
 480702-1509 Review career goals.

**STANDARD
480702-16**

Students will understand the importance of employability and work habits.

OBJECTIVES

- 480702-1601 Develop a list of work standards to follow at school and on the job.
480702-1602 Evaluate your personal ethics.
▪ Evaluate your personal ethics against acceptable workplace ethics.
480702-1603 Build a job search network.
480702-1604 Find job leads.
480702-1605 Write a resume.
480702-1606 Create a job portfolio.
480702-1607 Complete a job application.
480702-1608 Write a business letter and memo.
480702-1609 Participate in an actual or simulated job interview.
* SkillsUSA PDP requirements - recommended