Arkansas CTE

Furniture Manufacturing: Grades 9, 10, 11, 12

Adopted 2004

Trees	A001.	Discuss a structural diagram of a tree A001
	A002.	Explain the functions of different parts of a tree A002
	A003.	Name and identify conifers and broad leaf species A003
	A004.	Explain processes and functions of a tree on the microscopic level, such as photo synthesis, movement of water, etc. A004
Forestry	B001.	Identify major forest regions in the United States B001
	B002.	Discuss local forest regions and their impact on local economies B002
	B003.	Practice forest measurements on a short timber cruise B003
	B004.	Discuss forest protection (fires, insects, and diseases) B004
Environmental Issues	C001.	Discuss the issue of protecting forests (local forest, rain forests, etc.) C001
	C002.	Explain the term "sustainable forestry" and view video by Patrick Moore C002
	C003.	Explain the terms "selective cutting" and "clear cutting" and their applications C003
	C004.	Discuss current environmental issues, such as the Kyoto Protocol, global warming, depletion of the ozone layer, etc. C004
Lumber and Lumber Grading	D001.	Collect and identify samples of various wood species D001
	D002.	List the working characteristics of various wood species D002
	D003.	List natural defects in wood D003
	D004.	Name grades of softwood lumber D004
	D005.	Name grades of hardwood lumber D005

	D006. List different sawing patterns for lumber and their preferred use D006
	D007. Identify the commercial value of various wood species in different lumber grades D007
Wood Moisture Relationship and Lumber Drying	**E001.** Explain the term "relative humidity" as it relates to lumber E001
	E002. Explain the transport of water in lumber E002
	E003. Describe the process of shrinkage and swelling in wood E003
	E004. Describe problems caused by wood moisture in manufacturing wood products E004
	E005. Measure the moisture content of different wood samples using a moisture meter E005
	E006. Measure wood movements under changing climatic conditions E006
	E007. Describe ideal conditions for storing lumber E007
	E008. List methods of drying lumber E008
	E009. Explain the process of drying lumber in a kiln E009
	E010. Describe drying-related defects in lumber and their causes E010
Veneer and Wood Composites	**F001.** Describe different methods and applications in producing veneers F001
	F002. Describe the correct storage and handling of veneers F002
	F003. Define the field of wood composites F003
	F004. List advantages and disadvantages of wood composites F004
	F005. Identify the commercial value of different wood composite materials F005
Design	**G001.** Describe good principles in design G001
	G002. Discuss methods of constructing furniture G002
	G003. Explain design and function of a project G003
	G004. Discuss aesthetic proportions and features of wood components and furniture G004
	G005. Discuss the impact that grain patterns, stains, colors, etc., have on a selected project G005

	G006. Discuss appropriate surfaces (visible and nonvisible) for the selected project G006
	G007. Select an appropriate connection method G007
	G008. Discuss the characteristics of functional and nonfunctional design G008
Information Gathering	**H001.** Select project components and raw materials from books, catalogues, Internet, etc. H001
	H002. Discuss assembly drawings and assembly directions for project components H002
	H003. Discuss norms and regulations (i.e., OSHA, ISO, etc.) that pertain to the project H003
Work Flow	**I001.** Sequence work steps for the project I001
	I002. Evaluate the effectiveness of machinery and tools required for the project I002
	I003. Discuss appropriate preventive measures for job safety and health protection I003
	I004. Determine labor hours for the project (including time for helpers) I004
	I005. Develop a format for customer invoicing I005
Project Presentation	**J001.** Review bill of materials and labor estimates J001
	J002. Determine the total overhead cost for the project J002
	J003. Discuss advantages of design features and workmanship incorporated in the project J003
	J004. Prepare a customer presentation J004
Measurement	**K001.** Measure length using a rule or tape measure K001
	K002. Measure objects using a slide caliper and micrometer K002
	K003. Measure objects using metric and customary measuring systems K003
	K004. Perform basic mathematical computations used in measurement K004
	K005. Explain the term "board foot" K005
	K006. Determine the board footage of actual boards K006

	K007. Calculate the board footage of volumetric objects, such as a bunk of lumber, capacity of a dry kiln, etc. K007
	K008. Describe other measuring systems common in the national and international trade of forest and wood products, such as chord, bole, etc. K008
Area and Volumetric Calculations	**L001.** Calculate material requirements for square and triangular areas L001
	L002. Apply formula for calculating area and circumference of a circle in an industry-specific application L002
	L003. Calculate the ft^3 of a wooden block L003
	L004. Calculate the volume of wood in a log L004
Angles	**M001.** Review basic geometric concepts M001
	M002. Draw different angles, and determine their degrees M002
	M003. Measure different angles on woodworking machinery M003
	M004. Add and subtract angles M004
	M005. Discuss application of compound angles M005
Percentages	**N001.** Calculate percentages using industry examples N001
	N002. Calculate reject rates of machine runs N002
	N003. Calculate total material requirements N003
Wood Moisture Calculations	**O001.** Determine moisture content in wood O001
	O002. Observe and measure dimensional changes in wood O002
	O003. Calculate incremental, dimensional changes in wood O003
Project Cost	**P001.** Discuss prices for different raw materials P001
	P002. Calculate total material cost of a project P002
Feed Speed	**Q001.** Measure feed rates of various woodworking machines Q001
	Q002. Calculate expected machine output Q002
	Q003. Observe and discuss surface qualities at different machine speeds Q003

Planning a Project with a Working Drawing	**R001.**	**Sketch an example of each type of drawing technique** R001
	R002.	**Discuss "exploded view"** R002
	R003.	**Produce a working drawing** R003
	R004.	**Draw the selected class project in the appropriate drawing style** R004
	R005.	**Sketch and dimension a floor plan** R005
Bill of Materials	**S001.**	**Determine a bill of materials for project construction** S001
	S002.	**Develop a format for customer invoicing that shows bill of materials and costs** S002
Safety	**T001.**	**Explain the term "OSHA," and state some regulations covered by OSHA** T001
	T002.	**Recite the emergency plan for the shop** T002
	T003.	**Discuss hearing loss** T003
	T004.	**Describe personal protective equipment (PPE) used in a woodworking facility** T004
	T005.	**Explain the term "MSDS" and the information it contains** T005
	T006.	**Discuss machine guards and the importance of having them in place at all times** T006
	T007.	**Name the basic safety rules for electrical equipment** T007
	T008.	**Practice a "lock-out – tag-out procedure" on one stationary woodworking machine in your facility** T008
Hand Tools	**U001.**	**Review hand tools used in the woodworking trade** U001
	U002.	**Discuss basic safety rules for using hand tools** U002
	U003.	**Discuss typical applications of hand tools** U003
	U004.	**State proper techniques for using hand tools** U004
Tool Sharpening	**V001.**	**Describe safety precautions followed while sharpening hand tools** V001
	V002.	**List different tool materials, their properties, and preferred applications** V002
	V003.	**Explain operation of the grinder** V003
	V004.	**Practice sharpening tools using a grinder** V004

	V005. Discuss advantages of automatic grinding equipment V005
	V006. Practice sharpening and honing V006
Use of Power Tools	**W001.** Explain general safety procedures for the use of power tools W001
	W002. Explain specific safety procedures for portable power tools W002
	W003. Practice operation of portable power tools, applying appropriate safety procedures W003
	W004. Explain specific safety procedures for stationary power tools W004
	W005. Practice operation of stationary power tools, applying appropriate safety procedures W005
Operation of Power Tools (apply to each machine installed in the shop)	**X001.** Explain the function of each machine X001
	X002. Perform tool change and bring each machine back into operational status X002
	X003. Perform preventive maintenance procedures on each machine X003
Preparing Stock for Layout	**Y001.** Select the appropriate stock for a job Y001
	Y002. Glue stock to rough size using proper clamping procedures Y002
	Y003. Square rough stock to actual size for the job Y003
Wood Sanding	**Z001.** Explain the purpose of sanding Z001
	Z002. Define terms used in sanding wood Z002
	Z003. Describe different abrasives and their common applications Z003
	Z004. Sand wood parts using a hand held abrasive Z004
	Z005. Sand wood parts with a power sander Z005
	Z006. Change abrasive on a power sander Z006
Fasteners	**AA001.** Identify types and purposes of fasteners related to woodworking AA001
	AA002. Explore style, functionality, and cost of fasteners from catalogues and the Internet AA002
	AA003. Use at least three different kinds of fasteners in woodworking projects AA003

Adhesives	**BB001.**	**Identify appropriate adhesives for assembling various projects** BB001
	BB002.	**Apply adhesives** BB002
Cutting Joints with Power Equipment and Hand Tools	**CC001.**	**Explain the technique for constructing basic joints** CC001
	CC002.	**Lay out wood joints on stock** CC002
	CC003.	**Construct examples of basic joints** CC003
Assembly Techniques	**DD001.**	**Explain procedures for assembling a job** DD001
	DD002.	**Complete a trial assembly** DD002
	DD003.	**Assemble a job using prepared stock and appropriate adhesives, clamps, and fastening devices** DD003
Finishing	**EE001.**	**Discuss terms related to finishing wooden furniture** EE001
	EE002.	**State safety procedures related to finishing wooden furniture** EE002
	EE003.	**Describe the safe storage of finishes** EE003
	EE004.	**Identify types of finishes and their purpose** EE004
	EE005.	**Select an appropriate finish for a job** EE005
	EE006.	**Apply finishes using manual devices such as a sponge, paint brush, or roller** EE006
	EE007.	**Explain the proper care, cleaning, and maintenance of manual devices used in applying finishes** EE007
	EE008.	**Apply finishes with a spray gun** EE008
	EE009.	**Clean equipment, store supplies, and dispose of excess materials properly** EE009
Wood Veneers and Laminates	**FF001.**	**Define terms involved with laminates and veneers** FF001
	FF002.	**Apply laminates and veneers to wood parts** FF002
Assembling an Advanced Project	**GG001.**	**True up stock for project construction** GG001
	GG002.	**Clamp all stock to rough size** GG002
	GG003.	**Square rough stock to correct size** GG003

	GG004. Sand stock using power sander GG004
	GG005. Cut all joints laid out on stock GG005
	GG006. Assemble project using prepared stock and appropriate fastening devices GG006
	GG007. Perform finish sanding and scraping GG007
	GG008. Apply finish to advanced project GG008
Careers in Wood Manufacturing Industry	**HH001.** Discuss careers within the wood manufacturing industry HH001
	HH002. List local business and industries involved in wooden furniture making HH002
	HH003. Visit a local business or industry involved in the wood manufacturing industry HH003