

## Colorado CTE Course – Scope and Sequence

Course Name	Woodworking Technology		Course Details	Credit = 1.0 (Semester A and B)	
			Course = 0.50 Carnegie Unit Credit		
<b>Course Description</b>	This course provides an overview of the planning, design, layout, and technical drawing interpretation for practical use in woodworking, cabinetmaking, and mill working. Different cabinet and furniture styles used, various wood products and materials, and proper tool selection may also be covered. Students will be introduced to the different construction processes in the cabinetmaking, furniture making, and millwork industries. Students will learn about measurement, layout, shop drawings and cutting lists. They will gain a basic understanding of the various kinds of materials used in the industry. Students will learn to use selected woodworking tools and machinery. Correct and safe use of tools and equipment is emphasized. The construction of several projects will develop student’s woodworking skills.				
<b>Note:</b>	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.				
SCED Identification #	17006	Schedule calculation based on 60 calendar days of a 90-day semester. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.			
All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at <a href="https://www.cde.state.co.us/standardsandinstruction/essentialskills">https://www.cde.state.co.us/standardsandinstruction/essentialskills</a>					
Instructional Unit Topic	Suggested Length of Instruction	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
<b>Careers in the fine furniture/cabinetmaking industry</b>		Evaluate a wide range of career pathway opportunities for success in architecture and construction careers.	The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) explain the role of an employee in the furniture/fine woodworking industry;	Evaluate jobs data and employment projections in the construction industry from sources such as O*Net OnLine, synthesizing findings from each source.  (A) identify job opportunities with their accompanying job duties such as cabinetmaker, assembler, drafter,	SkillsUSA Personal skills SkillsUSA 4 Pillars

			<p>(B) demonstrate critical-thinking skills;</p> <p>(C) demonstrate the ability to solve problems using critical-thinking skills;</p> <p>(D) define effective relationship skills for the workplace;</p> <p>(E) recognize workplace issues such as sexual harassment, stress, and substance abuse;</p> <p>(F) explain the Occupational Safety and Health Administration (OSHA)</p>	<p>installer, fine woodworker, machinist, etc.</p> <p>(B) research career pathways, including education, job skills, and experience required to achieve that pathway. Define employment expectations of entry-level employees in local employment situations (hiring requirements, basic job expectations, etc.) Obtain OSHA 10 certificate and be able to state basic safety requirements for the industry. Demonstrate skills necessary to obtain employment:</p> <ul style="list-style-type: none"> <li>• Create an industry appropriate resume</li> <li>• Navigate online job posting tools and complete an employment application</li> </ul> <p>Demonstrate understanding of professional practice (i.e. proper work attire, appropriate language and interpersonal interactions and relationships, and</p>	
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				value of inclusivity and diversity in the workplace)	
<b>Safety</b>		Understand and apply practices and procedures required to maintain jobsite safety.	Identify and utilize general shop safety rules. Student is expected to: (A) identify and describe general shop safety rules. (B) demonstrate how to act and work safely around other people in a shop area. (C) demonstrate maintaining a clean, orderly, and safe working area. (D) demonstrate the use and care of personal protective equipment (PPE). (E) identify and operate different types of fire extinguishers. (F) identify and describe general shop safety hazards. (G) demonstrate safely transporting, handling, and storing of materials.	Identify basic jobsite safety hazards. Demonstrate use of basic Personal Protective Equipment (PPE) and when specific PPE is required. Understand basic workplace injuries and how to communicate the injury to others in an emergency. Demonstrate safe handling of materials and equipment. Demonstrate safe use of fire extinguishers. Demonstrate ability to communicate workplace hazards. Obtain OSHA 10 certification	SkillsUSA Workplace Professional Skills
<b>Communication and Terminology</b>		Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities. Recognize and identify basic terms used in the fine furniture/cabinetmaking industry.	Demonstrate understanding of common jobsite terms and apply in appropriate context. Student is expected to: (A) identify and describe the types of hardwoods and softwoods and other materials used in the fine	Demonstrate ability to communicate effectively in the workplace and basic problem-solving skills. Demonstrate the ability to work independently and within a team by successfully completing a group assignment.	SkillsUSA Workplace Professional Skills

		<p>Use vocabulary, symbols and formulas commonly used in design and construction.</p>	<p>furniture and cabinetmaking profession          (B) interpret and describe different wood joint names.          (C) identify and explain the different types of warps.          (D) identify and be able to explain the classifications of trees.          (E) identify different types of resistors and explain how the resistance values are determined for the following:          A. Solid hardwoods              1. Cherry              2. Black Walnut              3. Red Oak              4. Mahogany              5. Poplar              6. Basswood              7. Maple              8. Poplar          B. Plywood              (A) Soft wood plywood              (B) Hardwood plywood          C. Particle board and medium-density fiberboard (MDF)          D. Lauan          (F) interpret and describe the parts of a board.          (G) identify common defects found in wood and list possible solutions.</p>	<p>Demonstrate standard employer-employee communication practices and protocols pertaining to the daily work-environment. (keeping time records, updating schedule documents, participating in toolbox talks, etc.)          Compare and contrast the advantages and disadvantages of sheet goods versus solid wood stock.          Research and report on common woods found in the industry. Analyze trends in furniture making and present the findings.</p>	
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<p><b>Mathematics in furniture making</b></p>		<p>Demonstrate mathematic knowledge and skills relevant to the fine furniture/cabinetmaking field.</p>	<p>Demonstrate reading a ruler to solve problems related to the fine furniture/cabinetmaking field. To student is expected to:</p> <p>(A) apply general math, geometry, and algebra skills to solve problems related to the fine furniture/cabinetmaking with and without a calculator.</p> <p>(B) demonstrate and apply math skills to make and fill out a bill of materials sheet.</p> <p>(C) interpret and use drawing dimensions and scales.</p> <p>(D) calculate board feet in order to solve problems related to the fine furniture/cabinetmaking field.</p>	<p>Use physical measurement devices typically employed in construction to complete accurate field measurements.</p> <ul style="list-style-type: none"> <li>Determine the appropriate units and record accurate measurements of lengths and angles. Tools should include, but are not limited to: fractional rule, metric rule, measuring tape, architect's scale, engineer's scale, dial caliper, micrometer, protractor, and square.</li> </ul> <p>Performing conversions between fractions, decimals, and percent. For example, convert a decimal to a fraction to prepare a unit for measurement on a fractional scale to the precision of 1/16 of an inch.</p>	<p>SkillsUSA Applied Math competition</p>
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				Create a practical project cost estimate that includes materials, labor and timelines, overhead, profit and add-ons	
<b>Blueprints, Drawings, and Layout</b>		Recognize and describe basic drawing terms, components, and symbols. Use vocabulary, symbols and formulas commonly used in design and construction.	The student develops the basics of construction drawing. The student is expected to: (A) interpret and use drawing dimensions; (B) recognize and identify basic construction terms; (C) recognize and identify basic drawing components; (D) recognize and identify commonly used drawing symbols; (E) relate information on construction drawings to actual locations on the print; and (F) recognize different classifications of construction drawings	Demonstrate knowledge of cabinetmaking design. Demonstrate knowledge of and ability to navigate a standard set of construction documents. Demonstrate ability to read and interpret various print views. Demonstrate ability to interpret the following elements of construction documents: <ul style="list-style-type: none"> <li>• Dimension lines</li> <li>• Symbols</li> <li>• Notes</li> <li>• Plan</li> <li>• Elevations</li> <li>• Section</li> <li>• Scale</li> <li>• Industry codes</li> </ul> Create a cut list. Demonstrate steps to layout a project according to a blueprint: <ul style="list-style-type: none"> <li>• List the sequence of cutting procedures,</li> </ul>	SkillsUSA Technical Skills grounded in academics

				<p>assembly, and finishing steps.</p> <ul style="list-style-type: none"> <li>• Optimize available materials from a cutting diagram</li> </ul>	
<b>Hand and Power Tools</b>		<p>Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.</p>	<p>Demonstrate the use of hand and portable power tools relevant to the fine furniture/cabinetmaking profession. Student is expected to:</p> <p>(A) demonstrate reading and use of measuring instruments.</p> <p>(B) identify and describe various hand and portable power tools.</p> <p>(C) demonstrate selecting the correct tools for specific jobs.</p> <p>(D) demonstrate cleaning and maintenance of hand and portable power tools.</p> <p>(E) demonstrate proficiency in the safe use of hand and portable power tools.</p> <p>(F) state and explain the application of all hand and portable power tool safety rules.</p>	<p>Use tools, machinery and equipment according to industry standards. Properly maintain tools, machines and equipment in a safe manner. Demonstrate safe use and storage of the following hand tools:</p> <ul style="list-style-type: none"> <li>• Tape measures and other measuring tools</li> <li>• Hammers</li> <li>• Prybars</li> <li>• Levels</li> <li>• Chalk line</li> <li>• Speed square</li> <li>• Various plyers</li> <li>• Various Wrenches</li> <li>• Utility knife</li> <li>• Screwdrivers</li> <li>• Clamps</li> <li>• Extension cords</li> </ul> <p>Demonstrate safe use and storage of the following power tools:</p> <ul style="list-style-type: none"> <li>• Miter saw</li> </ul>	

				<ul style="list-style-type: none"> <li>• Corded and cordless drill and impact drivers</li> <li>• Circular saw</li> <li>• Jigsaw</li> <li>• Reciprocating saw</li> <li>• Grinding and sanding devices</li> <li>• Knowledge of various blades, drill bits, and driver bits</li> <li>• Pneumatic staplers and nailers</li> </ul> <p>Demonstrate safe and proper operation of measuring and layout tools.</p>	
<b>Machinery</b>		Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.	<p>Demonstrate and utilize equipment/machines relevant to the fine furniture/cabinetmaking profession.</p> <p>(A) identify and be able to describe the various types of machines and related parts relevant to the fine furniture/cabinetmaking profession.</p> <p>(B) state and apply the safety rules for operating all machines, regardless of type in the fine furniture/cabinetmaking profession.</p>	<p>Demonstrate safe use and storage of the following power tools and machinery knowledge:</p> <ul style="list-style-type: none"> <li>• Bandsaw</li> <li>• Table saw</li> <li>• Planer</li> <li>• Router/Multi-router</li> <li>• Drill Press</li> <li>• Woodturning lathe</li> </ul> <p>Perform a basic maintenance of woodworking tools and equipment.</p>	



			<p>(C) demonstrate the special operation and procedures required for each piece of equipment/machine.</p> <p>(D) identify and describe different types of wood joints and which machine or machines are used to make each joint.</p>	<p>Demonstrate knowledge of new and emerging technologies that may affect mill and cabinetmaking.</p>	
<b>Wood Joinery</b>		<p>Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.</p>	<p>Demonstrate the making and assembling of basic wood joints used in the fine furniture/cabinetmaking profession.</p> <p>(A) Recognize and identify the basic wood joint used in the fine furniture/cabinetmaking industry.</p> <p>(B) Demonstrate how to cut and assemble the various types of wood joints.</p> <p>(C) Demonstrate gluing, clamping and fastening the different types of wood joints.</p> <p>(D) Identify and describe common wood joints, such as the following:</p> <ol style="list-style-type: none"> <li>a. Dado</li> <li>b. Blind Dado</li> <li>c. Groove</li> <li>d. Edge rabbet</li> <li>e. Pocket</li> <li>f. Dovetail</li> </ol>	<p>Describe how the expansion and contraction of solid wood affects the design of joinery used in furniture and cabinet construction.</p> <p>Compare and contrast joints commonly used in the cabinetmaking and millworking industries (i.e., strength, appearance, and ease of construction)</p> <p>Determine the appropriate application of a variety of joinery techniques, including dowels, biscuits, pocket holes, and mortise and tenon.</p> <p>Select the correct type of wood joint used for a specific application and material.</p> <p>Demonstrate the ability to construct a variety of wood joints (i.e. butt, miter, compound miter,</p>	<p>SkillsUSA Cabinetmaking competition</p>

			g. Butt joints: Edge to Edge; Face to Face; and Edge to Face	half lap, mortise and tenon).	
<b>Glue and Fasteners</b>		Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.	Identify and demonstrate how to fasten stock and wood joints. (A) Identify and describe types of glue and fasteners. (B) Demonstrate fastening stock with glue and clamps. (C) Demonstrate gluing and clamping stock using various techniques. (D) Demonstrate fastening stock and wood joints with appropriate fasteners, such as: a. Nails b. Staples c. Screws d. Bolts	Identify the proper adhesive required for applying laminate and veneers: Define the purposes for metallic fasteners in furniture and cabinetmaking. Select the proper metallic fasteners for specific applications. Demonstrate the proper use of metallic fasteners for specific applications. Identify characteristics of adhesives that affect the assembly time, cure time, and strength of the product. Select the proper adhesive(s) to construct wood joints used in furniture or cabinets. Demonstrate initial assembly and dry clamping procedures. Demonstrate the proper cleanup procedures for specific adhesives.	
<b>Finishing Techniques</b>		Safely use and maintain appropriate tools,	Prepare fine furniture, cabinets for finish:	Compare and contrast the advantages and	

		<p>machinery, equipment and resources to accomplish construction project goals.</p>	<p>(A) Demonstrate sanding all wood surfaces for finishing.</p> <p>(B) Demonstrate selecting and applying proper wood fillers.</p> <p>(C) Identify and demonstrate the use of different types of sandpaper.</p> <p>(D) Demonstrate how to sand and select the proper grits to be used on the project.</p> <p>(E) Identify wood defects and describe how to repair properly.</p> <p>(F) Observe and describe safety precautions when sanding wood.</p>	<p>disadvantages of using laminates verses using veneers:</p> <ul style="list-style-type: none"> <li>• Identify standard sizes and grades of various veneers.</li> <li>• Identify the proper adhesive(s) required for applying veneers.</li> <li>• Identify the different types of pattern matching in veneers.</li> </ul> <p>Properly finish a project:</p> <ul style="list-style-type: none"> <li>• Select the proper abrasive for shaping and smoothing materials.</li> <li>• Select the proper grit sizes and sequences for shaping and smoothing operations.</li> <li>• Demonstrate proper selection, application, and cleaning methods for various types of filler materials.</li> </ul>	
<b>Basic Stain</b>		<p>Safely use and maintain appropriate tools, machinery, equipment and</p>	<p>Apply stains and finishing:</p> <p>(A) Demonstrate selecting and applying stain to</p>	<p>Manufacture, assemble and apply appropriate finish to the project:</p>	


