

Colorado CTE Course – Scope and Sequence

Course Name	Carpentry Technology II		Course Details	Credit= 1.0- 2.0	
			Course = 0.50 Carnegie Unit Credit	Prerequisites: Carpentry Technology I CTE Credential: CTE Architecture and Construction	
Course Description	This course of the Carpentry program and will focus on stairs, residential and commercial drawings, heavy steel framing, thermal or moisture barriers, steel stud framing, drywall installation and finishing, suspended ceilings, window, door and cabinet installation. Throughout the course, students will interpret construction drawings to complete projects, implementing material estimating procedures and safe working practices. Standards in this course also expand on principles of the construction industry and delve deeper into business and project management strategies.				
Note:	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 #	17003	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 https://www.cde.state.co.us/standardsandinstruction/essentialskills					
Instructional Unit Topic	Suggested Length of Instruction	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Commercial Construction Drawings and Specifications		Read and interpret a set of commercial drawings and specifications.	The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. Student is expected to: <ul style="list-style-type: none"> A) identify the types and uses of commercial construction drawings and schedules. B) define the use of specifications 	Compare and contrast residential and commercial construction drawings. Describe the purpose of a civil drawing. Describe the use of architectural drawings and schedules. Describe the use of structural drawings. Describe the purpose of mechanical, electrical, and plumbing drawings.	

			<p>and how they are referenced;</p> <p>C) accurately read a set of commercial drawings;</p> <p>D) explain basic construction details and concepts employed in commercial construction; and</p> <p>E) calculate the area of each room in a floor plan.</p>	<p>Compare drawings from two different disciplines.</p> <p>Discuss the information needed to set foundation forms, and identify the types of foundations commonly used for commercial structures</p>	
Metal Framing		<p>Identify the tools and components of cold-formed steel framing systems and their safe use.</p>	<p>Student is expected to:</p> <p>A) Identify the safety guidelines that should be followed when working with cold-formed steel;</p> <p>B) Identify steel framing materials;</p> <p>C) List the steel framing tools and fasteners;</p> <p>D) Explain how to perform a material takeoff for a steel frame project; and</p>	<p>Describe the basic steel construction methods for framing interior and exterior walls. Explain how to frame nonstructural and structural steel walls.</p> <p>Describe where steel framing members are used in other commercial applications (floor, ceiling, and roof construction) and site differences or special considerations in their installation.</p> <p>Estimate the amount of materials to complete an instructor-specified steel framing project.</p>	

			E) Identify the steps to lay out and install a steel stud wall.	Demonstrate steel framing techniques: layout, bracing and blocking, headers, etc.	
Exterior Finishes		Demonstrate knowledge of exterior finish materials and their installation procedures.	<p>The student learns the processes to install various exterior siding materials. Student is expected to:</p> <ul style="list-style-type: none"> A) describe the purpose of wall insulation and flashing; B) install selected common cornices; C) demonstrate lap and panel siding estimating methods; D) describe the types and applications of common wood siding; E) describe fiber-cement siding and its uses; F) describe the types and styles of vinyl and metal siding; G) describe the types and applications of stucco and 	<p>Describe the safety hazards when working with exterior finish materials.</p> <p>Describe the various types and applications of exterior finish materials:</p> <ul style="list-style-type: none"> • flashing • cornices • composite siding • wood siding • vinyl siding • stucco • metal siding <p>Explain how to install exterior finish materials.</p> <p>Analyze various finish systems used to sheath a building, including but not limited to wood siding, fiber-cement siding, vinyl siding, metal siding, stucco, and masonry veneer finishes. Perform a case study of three different buildings in the community which are sheathed in different ways, hypothesizing why the different materials and methods were selected for each.</p>	

			<p>masonry veneer finishes; and</p> <p>H) install three types of siding commonly used in the local area.</p>		
Drywall		Describe the various types of drywall, their applications, and installation methods.	<p>Student is expected to:</p> <p>Identify components of a drywall assembly;</p> <p>Describe the installation of drywall;</p> <p>Describe six levels of finish according to industry standards;</p> <p>Understand rated assemblies of drywall construction;</p> <p>Demonstrated how to calculate a takeoff.</p>	<p>List the types of gypsum products.</p> <p>Identify drywall fasteners and list their uses.</p> <p>Install gypsum drywall panels on a stud wall and a ceiling using common fastening systems.</p> <p>Given an application scenario, estimate material quantities for an installation.</p> <p>Identify common issues related to drywall and their causes; identify the correct methods for solving each type of problem that occurs in drywall finishes.</p> <p>Demonstrate how to patch damaged drywall.</p>	
Suspended ceiling systems		Describe the materials, layout, and installation procedures for various types of suspended ceilings used in commercial construction.	<p>Student is expected to:</p> <p>A) Identify the components necessary to properly install a</p>	Identify the tools and equipment to lay out and install a suspended ceiling system.	

			<p>suspended ceiling system;</p> <p>B) Interpret a reflected ceiling plan;</p> <p>C) Identify the procedures to lay out and install a suspended ceiling system; and</p> <p>D) Calculate material takeoff.</p>	<p>Identify the installation methods and procedures for a suspended ceiling system.</p> <p>Demonstrate how to establish a level line.</p> <p>Estimate the quantities of materials needed to install a lay-in suspended ceiling system in a typical room from an instructor-supplied drawing.</p>	
<p>Window and Door Installations</p>		<p>Understand and apply industry standards for the installation of various windows and doors.</p>	<p>The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:</p> <p>A) identify various types of door jambs and frames;</p> <p>B) demonstrate the installation procedures for placing door jambs and frames in different types of interior partitions;</p> <p>C) identify different types of interior doors;</p> <p>D) identify different types of interior door hardware</p>	<p>Identify the different types of standard moldings and materials: base moldings, wall moldings, ceiling moldings, and window and door trim.</p> <p>Explain how to install different types of molding including cutting and fastening.</p> <p>Make square and miter cuts to selected moldings using a hand and power tools.</p> <p>Install interior trim using a finish nailer and hand nailing methods.</p> <ul style="list-style-type: none"> • Door trim • Window trim • Base trim • Ceiling trim 	

			<p>and demonstrate the installation procedures for them;</p> <p>E) list and identify items included on a typical door schedule; and</p> <p>F) demonstrate the procedure for placing and hanging a door.</p>		
Insulation		Select and install various types of insulating materials in walls, floors, and attics.	<p>The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:</p> <p>A) describe the requirements for insulation;</p> <p>B) describe the characteristics of various types of insulation material;</p> <p>C) calculate the required amounts of insulation for a structure;</p> <p>D) install selected insulation materials;</p> <p>E) describe the requirements for moisture control and ventilation;</p>	<p>Describe the safety and health hazards when working with insulation. List the personal protective equipment (PPE) that is required when working with insulation. Describe how to safely handle insulation.</p> <p>Describe the various types of insulation and their characteristics. Explain how to determine R-value requirements. Describe various types of insulation and list its characteristics i.e. flexible, loose-fill, rigid or semi-rigid, and reflective.)</p> <p>Research new types of insulation or weatherization materials. Compare and contrast the materials, costs, and application considerations.</p>	

			<ul style="list-style-type: none"> F) install selected vapor barriers; G) describe various methods of waterproofing; H) describe air infiltration control requirements; and I) install selected building wraps. 		
Trim Finishing		Demonstrate skills necessary to complete finish trim work.	<p>The student knows the types of trim used in finish work. The student is expected to:</p> <ul style="list-style-type: none"> A) identify the different types of standard moldings and describe their uses; B) make square and miter cuts using a miter box or power miter saw; C) make coped joint cuts using a coping saw; D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim; and 		

			E) estimate the quantities of different trim materials required for selected rooms.		
Cabinetry Installation (Optional)		Understand correct procedures to install wall and base cabinets, and countertops.	<p>The student selects and installs base and wall cabinets and countertops. The student is expected to:</p> <ul style="list-style-type: none"> A) state the classes and sizes of typical base and wall kitchen cabinets; B) identify cabinet components and hardware and describe their purposes; C) lay out factory-made cabinets, countertops, and backsplashes; D) explain the installation of an island base; E) recognize the common types of woods used to make cabinets; F) identify and cut the various types of joints used in cabinetmaking; 	<p>Explain how to lay out and install a basic set of cabinets. Describe the surface preparation needed before cabinet installation. Explain how to install wall cabinets. Explain how to install base cabinets and countertops.</p> <p>Research trends in kitchen and bath hardware and design. Create a proposal for a customer based on a budget and a design concept. Include a list of materials needed for installation.</p> <p>Demonstrate how to install base and wall cabinet units.</p>	

			<ul style="list-style-type: none"> G) build a cabinet from a set of drawings; and H) install plastic laminate on a countertop core. 		
Stairs		<p>Understand the code requirements for stair installation.</p> <p>Apply knowledge and technical skills related to installation of stairs.</p>	<p>The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:</p> <ul style="list-style-type: none"> A) identify the various types of stairs; B) identify the various parts of stairs; C) identify the materials used in the construction of stairs; D) interpret construction drawings of stairs; E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway; F) lay out and cut stringers, risers, and treads; and 	<p>Analyze the components of a stair system. Read and interpret construction drawings to determine stair system requirements such as the total rise, number and size of risers, and number and size of treads. Based on stated requirements, estimate the amount of material needed to frame a stair assembly.</p> <p>Apply the appropriate tools, equipment, and procedures to safely build a small stair unit, demonstrating proper procedures for laying out and cutting stringers, risers, and treads.</p>	

			G) build a small stair unit with a temporary handrail.		
Plumbing Systems (Optional)		<p>Understand the relationship of safety in the plumbing occupation to public and private health concerns. Apply scientific principles to common plumbing applications.</p> <p>Understand technical relationships between plumbing systems and the collection and movement of water and waste-water in buildings.</p> <p>Develop basic technical skills for plumbing services and repair.</p>	<p>Understand and apply knowledge to repair and service of plumbing systems and components. Student is expected to:</p> <p>A) Examine safety considerations specific to plumbers by identifying possible hazards on a job site.</p> <p>B) Determine common requirements found in plumbing codes and explain why the codes are necessary</p> <p>C) Describe the movement of potable water and waste within the plumbing systems of a building.</p> <p>D) Practice technical skills related to installation, maintenance, and repair of</p>	<p>Study a schematic plan of a typical community sewer system. Citing evidence from a technical description or actual observation of a system, explain how waste moves through a drain, waste, and vent system from the fixture to the environment. Create a graphic illustration to represent the movement of waste from one component to the others in the system. For example, create a basic diagram of how the waste generated by a clean-up sink in the classroom travels to the local sewage treatment plant.</p> <p>Demonstrate understanding of the specific roles of various plumbing components in a drain, waste, and vent system by sketching a system model. Label the components, and include a written description of the function of each. Be able to describe the physical principles involved such as gravity and pressure.</p> <p>Analyze the function of a trap by examining a drain, waste, and vent system whose trap</p>	

			plumbing systems.	<p>has lost its seal. Diagnose and explain the cause and determine the appropriate solution, citing evidence from textbooks or technical manuals in order to justify why the chosen solution is preferable or more effective than another.</p> <p>Construct a model to explain how physical principles such as gravity and pressure apply within plumbing systems, and how they contribute to the proper functioning and efficiency of the system. · Illustrate why an understanding of these physical principles is important to a plumbing professional in the design, installation, maintenance, and repair of plumbing components and systems.</p> <p>Examine a health or safety issue involved with plumbing. Write an explanatory text to illustrate the problem and describe how it can be prevented or remedied with proper plumbing applications.</p>	
HVAC Systems (Optional)		Understand and apply HVAC practices and procedures.	Understand and apply knowledge to repair and service of HVAC systems and components.	Demonstrate understanding of the principles of heating, ventilation and air conditioning systems. Use graphic illustrations and supporting text to describe	

			<ul style="list-style-type: none"> A) Examine safety considerations specific to HVAC technicians by identifying possible hazards on a job site. B) Describe the basic components included in an HVAC system and identify key information from blueprints, manuals, and manufacturers' specifications. C) Understand the fundamental concepts of heating and combustion, including describing the processes by which heat is transferred. 	<p>the structure and function of each system.</p> <p>Examine the regulations which impact the work of HVAC technicians, such as the Clean Air Act and EPA guidelines. Create a brochure to inform an individual contemplating beginning an HVAC business of these regulations, explaining key considerations and citing resources.</p>	
Career Development		Investigate business and project management practices.	<p>Student is expected to:</p> <ul style="list-style-type: none"> A) practice time management techniques; B) investigate local business and project management practices within the industry to 	<p>Research local business practices for managing projects. Identify software or other project management practices being used in the industry. Analyze how to develop skills related to incorporating new practices identified.</p>	<p>SkillsUSA Technical Skills Grounded in Academics SkillsUSA Carpentry Contest; Plumbing Contest; Team Works Contest</p>

			<p>develop schedules and maintain jobsite communication; and</p> <p>C) analyze career and academic plan goals and objectives.</p>	<p>Establish and implement specific goals to manage project assignments in a timely manner, including organizing teams to effectively manage assignments, monitoring and reporting on project progress, and evaluating a completed project according to client requirements. For example, inspect and critique a team member's work, providing constructive feedback for improvement. Similarly, respond to constructive feedback from a team member to improve project outcomes and meet project goals.</p> <p>Perform estimating and scheduling techniques for a long-term project, including calculating material quantities and cost (including tax) and labor cost to complete a bid sheet; scheduling construction activities using a flow chart; and determining amounts to be charged to the client at various intervals throughout the project.</p> <p>Utilize technology to write and share periodical reports (weekly, monthly, etc.) to provide others with</p>	<p>Updates to ICAP</p>
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