

## Colorado CTE Course – Scope and Sequence

<b>Course Name</b>	<b>Construction Technology II</b>		<b>Course Details</b>	<b>Credit= 1.0-2.0</b>  <b>Prerequisites: Construction Technology or Construction Systems I</b>  <b>CTE Credential: Architecture and Construction</b>	
			Course = 0.50 Carnegie Unit Credit		
<b>Course Description</b>	In Construction Technology II, students will gain advanced knowledge and skills needed to enter the workforce as carpenters, building maintenance technicians or supervisors, or to prepare for a postsecondary degree in construction management, architecture, or engineering. Students will build on the knowledge base from Construction Technology I and are introduced to exterior and interior finish out 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 #	17002	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>					
<b>Instructional Unit Topic</b>	<b>Suggested Length of Instruction</b>	<b>CTE or Academic Standard Alignment</b>	<b>Competency / Performance Indicator</b>	<b>Outcome / Measurement</b>	<b>CTSO Integration</b>
<b>Site Layout</b>		Understand responsibilities of the carpenter for site layout.	Describe the responsibilities of the carpenter relative to construction drawings, control points, and hand signals. Student is expected to: A) Recognize, use, and properly care for tools and equipment associated with	Read and interpret a set of civil plans and how they relate to elevations on a job site. Identify the types of control points and explain their use on a job site. Describe how to use hand signals to communicate.  Identify the instruments commonly used for differential leveling. Explain how to set up and calibrate a	

			<p>differential leveling;</p> <p>B) Record site-layout data and information in field notes using accepted practices;</p> <p>C) Complete calculations pertaining to angular measurements and</p> <p>D) Lay out building lines using traditional and radial layout techniques.</p>	<p>leveling instrument. Explain how to use a builder's level and differential-leveling procedures to determine site and building elevations.</p> <p>Set up, adjust, and field-test leveling instruments. Convert measurements given in feet and inches to equivalent decimal measurements stated in feet, tenths, and hundredths, and vice versa.</p> <p>Use a builder's level, leveling rods, and/or laser level with appropriate differential-leveling procedures to determine site and building elevations.</p> <p>Record differential-leveling data in field notes in accordance with accepted procedures.</p> <p>Lay out building lines using traditional and radial layout techniques.</p> <p>Describe field checks for surveying instruments.</p> <p>Explain how to measure distances by taping.</p> <p>Describe how to measure horizontal and vertical angles.</p> <p>Explain how to lay out building lines. Describe additional distance and direction</p>	
--	--	--	--	---	--

				systems as they pertain to building layout.	
<b>Advanced Wall Systems</b>		Describe curtain walls, types of firewalls, fire-rated openings through these walls, and fire-protection methods for structural members.	Understand apply knowledge of advanced wall systems and the carpenter's role in their installation. Student is expected to: <ul style="list-style-type: none"> <li>A) Identify safety hazards to consider when erecting an advanced wall system;</li> <li>B) Describe the different types of advanced wall systems; and</li> <li>C) Demonstrate ability to construct firewalls in accordance with specifications.</li> </ul>	Describe hazards that may be present when installing wall systems.  Identify the fall protection equipment to be used when installing wall systems.  Describe the different types of advanced wall systems, including the use of curtain walls and identify the types of curtain walls.  Identify various types of insulated and masonry wall systems and explain the carpenter's role in their installation.  Define fire-rated construction and explain methods used to fireproof a wall system.	
<b>Advanced Stair Systems</b>		Understand materials and advanced techniques used stair systems for residential and commercial construction	Apply advanced knowledge of finishing wood stairways for residential construction and identify stair systems used in commercial construction. Student is expected to:	Identify the stair parts and materials in various systems.  Describe the procedure for cutting and installing various stairway systems (i.e. open service, closed service, main,	

			<p>A) Identify the stair parts in various systems;</p> <p>B) Describe the procedure for cutting and installing various stairway systems including custom stairways;</p> <p>C) Identify the materials that can be used to build commercial stairways; and</p> <p>D) Demonstrate stairway construction techniques for residential and commercial applications.</p>	<p>exterior, L and U-shaped, concrete, pre-fabricated.)</p> <p>Install treads and risers on open, closed, and/or combination open/closed main stairways.</p> <p>Demonstrate advanced stair installation techniques:</p> <ul style="list-style-type: none"> <li>• Miter a finished stringer and risers</li> <li>• Install a return nosing</li> <li>• Install a post-to-post balustrade system</li> <li>• Lay out an elliptical stairway</li> </ul>	
--	--	--	--	---	--

<p><b>Advanced Roofing Systems</b></p>		<p>Describe commercial roofing materials and structures.</p>	<p>Student describes commercial roofing materials and structures and as well as the procedures for installing commercial roofing, such as standing-seam, lap-seam, and built-up roofs. Student is expected to: Describe the characteristics and properties of metals as they relate to roofing applications. Identify types of advanced roof structures. Describe the installation of a metal roof. Describe the installation of a built-up roof.</p>	<p>Identify physical characteristics of metals. Identify mechanical properties of metals. Describe standard metal forms and structural shapes. Identify types of advanced roof structures. Discuss the use of steel trusses and joists used in commercial roofing. Identify other trusses used for commercial roofing.</p> <p>Demonstrate the installation of a metal roof. Prepare an eave for a metal roof. Install panels for a lap-seam roof, end-lapped standing-seam metal roof panels, and seal sidelap seams for a standing-seam metal roof.</p> <p>Identify safety precautions and hazards when installing roof systems.</p> <p>Identify design considerations when installing metal roofs. Explain how to install a lap-seam metal roof. Explain how to install a standing-seam metal roof.</p> <p>Describe the installation of a built-up roof.</p>	
--	--	--	---	--	--

<p><b>Construction Heavy Equipment</b></p>		<p>Understand safe use of various heavy construction equipment.</p>	<p>Demonstrate general safety, operation, and maintenance procedures for construction heavy equipment. Student is expected to: State the safety precautions associated with construction equipment; and Practice operations of a variety of heavy equipment (as available)</p>	<p>Identify and explain the safe operation and use of various pieces of construction equipment.</p> <p>Practice operations of a variety of heavy equipment (as available) including aerial lift, skid-steer loader, electric power generator, compressor, compactor, forklift, and backhoe.</p>	

<p><b>Welding</b></p>		<p>Explore and understand Oxyfuel and Arc welding systems that require standard hand and machine tools.</p>	<p>Student is expected to: Comply with standard industry and classroom safety requirements; Understand the purpose of completing a finished product that meets the standards of the AWS industry standard. Identify and explain the equipment, equipment setup, and techniques that apply to the following thermal cutting operations: a. Oxyfuel cutting b. Plasma-arc cutting c. Air carbon arc cutting d. Sawing e. Shearing f. Punching Select and use appropriate welding tools, equipment, and inspection devices to manufacture parts or products; and Introduce joint preparation methods and explain how to identify joint specifications.</p>	<p>Perform straight, shaped, and beveled cutting operations using both manual and machine-guided techniques. Properly use weld-washing techniques and visually examine cut surfaces for meeting the given specifications.</p> <p>Investigate other methods of cutting and welding. Compare and contrast other welding types to oxyfuel and arc welding processes.</p>	
<p><b>Construction Site Management</b></p>		<p>Investigate construction site procedures for the preconstruction process.</p>	<p>Describe the planning process that precedes the start of work on a construction site, including environmental considerations, personnel issues, access</p>	<p>Explore how environmental concerns are addressed in the construction preplanning process. Research the role that permitting plays. Describe environmental concerns and the</p>	

			<p>roads, traffic control, permits, site safety, utilities, and crane-related concerns. Student is expected to:</p> <ul style="list-style-type: none"> <li>A) List items that need to be addressed in the site utilization plan;</li> <li>B) Describe processes for evaluating a construction site including storm water protection and erosion and sedimentation control; and</li> <li>C) Identify methods to secure site safety and security.</li> </ul>	<p>role of federal, state, and local regulations in environmental issues.</p> <p>Identify ways construction companies use to prevent erosion and sedimentation. Identify methods used to mitigate subsurface water problems at a work site.</p> <p>List common practices for setting up a construction site, including:</p> <ul style="list-style-type: none"> <li>• Placement of utilities</li> <li>• Natural animal and vegetation concerns</li> <li>• Traffic and access concerns</li> <li>• Equipment considerations including cranes</li> <li>• Site safety and security considerations</li> </ul>	
<b>Career Development</b>		Investigate techniques for managing and developing crew leadership skills.	<p>Develop skills needed to become an effective crew leader. Student is expected to:</p> <ul style="list-style-type: none"> <li>A) Identify local opportunities and leadership requirements for crew lead or</li> </ul>	<p>Research local opportunities and leadership requirements for crew lead or supervisory position. Analyze your personal characteristics and investigate ways to develop skills that are desired by local businesses. Create a personal development plan.</p>	




