

Colorado CTE Course – Scope and Sequence

Course Name	Masonry Technology		Course Details	Credit = 1.0 Prerequisite; Principles of Construction CTE Credential= CTE Architecture and Construction	
			Course = 0.50 Carnegie Unit Credit		
Course Description	Masonry Technology provides information and techniques related to basic masonry and safety precautions.				
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 #	17008	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
Safety		Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Building and Construction Trades sector workplace environment.	The student identifies safe practices and expectations for the masonry industry. The student is expected to: (A) identify the costs of job accidents; (B) identify the causes of job accidents; (C) recognize the hazards; (D) demonstrate proper housekeeping techniques;	Identify safety hazards on a jobsite and demonstrate practices for safe working. Accurately read, interpret, and demonstrate adherence to safety rules, including but not limited to rules pertaining to electrical safety, Occupational Safety and Health Administration (OSHA) guidelines, and state and national code requirements. Be able to distinguish between the rules and explain why certain rules apply. Recognize and employ universal construction signs	

			(E) observe mortar and concrete safety; and (F) observe flammable liquid safety. The student demonstrates awareness of safe practices and expectations for the masonry industry and recognizes proper personal protective equipment. The student is expected to: (G) explain protective lenses and face shields; (H) describe hearing protection; (I) identify gloves used in the masonry trade; and (J) use respirators. The student explains safe practices and expectations for the masonry industry. The student is expected to: (K) explain the safe use of hand tools;	and symbols such as colors, flags, stakes, and hand signals that apply to construction workplace situations. Research and evaluate construction company safety plans from local industry. Explain the need for jobsite security to prevent liability. Drawing from examples, create and implement a jobsite safety program in the class to ensure safe practices and procedures including jobsite security procedures. Continue to maintain safety records and demonstrate adherence to industry-standard practices regarding general machine safety, tool safety, equipment safety, electrical safety, and fire safety to protect all personnel and equipment. For example, when operating tools and equipment, regularly inspect and carefully employ the appropriate personal protective equipment (PPE), as recommended by Occupational, Safety & Health Administration (OSHA) regulations. Incorporate safety procedures when operating tools and equipment, such as hand and	
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			(L) demonstrate the safe use of saws; (M) explain the safe use of mixers; (N) explain the safe use of grinders; (O) describe the safe use of powder-actuated tools; (P) explain how to work safely around a fork lift; (Q) list basic electrical safety guidelines; (R) explain how to store and stockpile masonry materials safely; and (S) demonstrate how to stack brick safely.	power tools, ladders, scaffolding, and lifting equipment. Complete safety test with 100 percent accuracy. Follow procedures to work safely around materials. Adhere to responsibilities for employees in material safety as outlined by the Hazard Communication Standard (HazCom), such as locating and interpreting material safety data sheets (SDS). For example, obtain an SDS for a given material from a supplier in the community. Demonstrate safe procedures to move materials by planning the movement, properly lifting, stacking, and storing materials, and selecting proper materials-handling equipment. Describe hazards involved with masonry work.	
Career Development		Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans. Identify career paths available in the masonry trades.	Understand employment practices in the construction masonry industry. Student is expected to: (A) discuss the history of masonry; (B) describe modern masonry	Continually reflect on coursework experiences and revise and refine the career plan generated in prior courses. Create a portfolio of work accomplished. Include photographs or illustrations and written descriptions of	Updates to ICAP SkillsUSA Personal and Employability Skills Framework

			materials and methods; and (C) identify career opportunities and skillsets in masonry career pathways.	sequential progress in construction projects. Research local job and internship opportunities and requirements. Update resume and practice job interview skills.	SkillsUSA Masonry Competition
Masonry Tools		Select and use tools and equipment appropriately for construction masonry applications.	The student identifies masonry hand tools. The student is expected to: (T) demonstrate how to use trowels; (U) demonstrate how to use hammers and chisels; (V) demonstrate how to use jointers and brushes; and (W) identify other equipment and tools used in masonry.	Demonstrate and explain the use of common masonry tools: • trowel • hammers and chisels • jointers • brushes • mixers Describe available options for specific tools. List manufacturers of specific masonry hand tools. List safety precautions and care for specific tools. Investigate common manually operated and power equipment used in the masonry construction industry. Discuss factors to consider when selecting specific types of equipment. List safety precautions and care for specific equipment.	

Measurements and Measuring Tools		Understand measurements and measuring tools related to construction masonry applications. Apply mathematics and perform calculations required for masonry construction.	The student understands the importance of measurements and measuring tools used in masonry. The student is expected to: (A) demonstrate how to use the modular spacing rule, brick spacing rule, oversized brick spacing rule, and steel tape measure; (B) demonstrate how to use levels; (C) demonstrate how to use chalk boxes, squares, plumb-bobs, and laser levels; and (D) demonstrate how to use corner poles, lines, and fasteners.	Lay out and construct an outside corner. Lay out and construct an inside corner. Lay out and construct 4", 8", and 12" brick jambs. List precautions taken when brick toothing. Demonstrate procedures for setting a corner pole. Demonstrate the use of Masonry Spacing Scales: • Identify and give the application for the three sets of spacing scales. • Lay out a wall to a specific height using the spacing scales. • Lay out a brick rowlock using masonry scales. • Discuss factors influencing the selection of scales.	
Mortar		Understand how mortar is used in construction.	Use mortar for masonry construction applications. Student is expected to: (E) name and describe the primary	List the ingredients of masonry mortars. Identify the types of cementitious materials used to make mortar.	

			ingredients in mortar and their properties. (F) identify the various types of mortar used in masonry work. (G) describe the common admixtures and their uses. (H) identify the common problems found in mortar application and their solutions. (I) properly set up the mortar mixing area. (J) properly mix mortar by hand. (K) properly mix mortar with a mechanical mixer.	List additives contained in some cementitious materials. Describe the procedures for mixing mortar manually and with a power mixer. List procedures for maximizing the intended performances of mortars. Describe the differences between mortars used for new construction and mortars used for repairing the joints of older and historical brick walls. Describe potential problems associated with mortars.	
Materials and Techniques		Apply knowledge of materials and techniques used in masonry professions.	The student describes materials and techniques used in basic masonry. The student is expected to: (A) explain how concrete masonry units (CMUs), or blocks,	Perform the following basic bricklaying procedures: • Mixing of mortar • Laying a mortar bed • Laying bricks Describe the most common types of masonry units.	

			are used in construction; (B) explain how clay masonry units (bricks) are used in construction; (C) explain how stone is used in construction; (D) describe how mortar and grout are used in masonry construction; and (E) describe how wall structures are created using masonry units.	- Identify the sizes of concrete masonry units. - List the ingredients of concrete masonry units. Describe and identify six brick positions. Describe and identify five pattern brick bonds. Laying Block to the Line: - Lay out a block wall in the running bond pattern. - Explain procedures for placing a cut block in a wall. - List the four procedures performed for laying each block to the line. - Demonstrate procedures for hanging a line and twigging a line. - Lay block to the line in the running bond pattern.	
Drawings and Specifications		Use construction blueprints and drawings to complete construction projects.	Use blueprints and construction drawing for masonry construction applications. Student is expected to:	Explain the relationship between construction drawings and specifications. Describe how both the construction drawings and specifications provide	

			(A) identify the basic parts of a set of drawings; (B) discuss the different types of specifications used in the building industry and the sections that pertain to masonry; (C) work with denominate numbers; (D) read a mason's measure; (E) convert measurements in the U.S. Customary (English) system into their metric equivalents; and (F) recognize, identify, and calculate areas, circumferences, and volumes of basic geometric shapes.	information about masonry projects. Describe processes by which construction professionals obtain clarification from architects regarding construction documents, such as by the use of requests for information (RFI's). Write a request for information (RFI), as would a construction professional to an architect to request clarification for a detail of the construction documents, such as the selection of a product.	
Business and Project Management		Acquire and accurately use Building and Construction Trades sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats. Understand best practices for managing business	The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: (A) investigate business	Describe the components and purpose of a basic contract document for a residential project, determining the meaning of key terms and other industry-specific words. Recognize the relationship and responsibilities of various parties to a contract. Write a basic contract for a job, such as a service agreement for	

		communications and projects.	practices for contract services; and (B) identify common practices for effective communication in the workplace for individuals and teams.	work done for a residential client. 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.	

Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

[CO CTE Academic Standards Resources](#) (Rubrics, integration strategies, etc) [CDE Colorado Academic Standards Online](#) (Online standards lookup tool)

Reading, Writing, & Communicating

Standard 1: Oral Expression and Listening

- **Prepared Graduate 1:** Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.
- **Prepared Graduate 2:** Deliver effective oral presentations for varied audiences and varied purposes.

Standard 2: Reading for All Purposes

- **Prepared Graduate 4:** Read a wide range of informational texts to build knowledge and to better understand the human experience.
- **Prepared Graduate 5:** Understand how language functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking.

Standard 3: Writing and Composition

- **Prepared Graduate 7:** Craft informational/explanatory texts using techniques specific to the genre.
- **Prepared Graduate 8:** Craft narratives using techniques specific to the genre.
- **Prepared Graduate 9:** Demonstrate mastery of their own writing process with clear, coherent, and error-free polished products.

Standard 4: Research Inquiry and Design

- **Prepared Graduate 10:** Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.

Note: Mathematics and Science standards will be added in the future. Visit the [Colorado Academic Standards](#) page for the most current version.