

Colorado CTE Course – Scope and Sequence

Course Name	Masonry Technology II		Course Details	Credit= 1.0-2.0 Prerequisite: Masonry Technology I CTE Credential: Architecture and Construction	
			Course = 0.50 Carnegie Unit Credit		
Course Description	Masonry Technology II is designed to further enhance the skills and knowledge of the beginning masonry student.				
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 #	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 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
Professional Employability Skills		Demonstrates professional standards/employability skills as required by business and industry.	The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: (A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work		

			ethic, integrity, multitasking, initiative, creativity, and how to follow directions; (B) demonstrate an understanding of the importance of showing up to work on time, maintaining appropriate personal appearance, working as a team member, and being honest; (C) demonstrate an understanding of the responsibilities of driving a company vehicle; (D) demonstrate an understanding of why and how listening is a critical skill; and (E) demonstrate an understanding of the importance of being a self-starter and of increasing one's knowledge and skills in a chosen career field.		
Career Development		Develop career understanding and readiness. Integrate multiple sources of career information from	The student reviews employer and customer expectations. The student is expected to:	Continually reflect on coursework experiences and revise and refine the career plan generated in prior courses.	Updates to ICAP SkillsUSA Personal and Employability

		diverse formats to make informed career decisions, solve problems, and manage personal career plans.	(A) identify job opportunities such as a plumber, building maintenance technician or supervisor, manager, and mechanical engineer and their accompanying job duties; (B) research careers along with the education, job skills, and experience required to achieve career goals; (C) identify the industries and associations that make up the modern mason profession; (D) demonstrate an understanding of how to properly treat company and customer property; (E) demonstrate an understanding of the importance of keeping the work area clean and how that applies to job safety; and (F) demonstrate an understanding of the importance of using proper methods and	Create a portfolio of work accomplished. Include photographs or illustrations and written descriptions of sequential progress in construction projects. Research local job and internship opportunities and requirements. Update resume and practice job interview skills.	Skills Framework SkillsUSA Masonry Competition
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			techniques for the job being performed.		
Applied Mathematics			The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to: (A) read a six-foot rule; (B) read other measuring devices; (C) read a mason's rule; (D) apply the 3-4-5 formula to square a corner; (E) recognize modular increments; and (F) describe how to determine areas and circumferences.		
Blueprints and Specifications			Understand and read specifications and drawings. Student is expected to:	Describe the basic parts of a set of residential drawings and list the information found on each type of drawing. a. Identify keys and legends, as well as selected lines, architectural terms, abbreviations, and symbols on	

			(G) explain the basic parts of a set of drawings; (H) identify lines, symbols, and abbreviations used on drawings; (I) explain scales and dimensions used on drawings; (J) explain types of construction drawings; (K) identify the purpose of specifications, standards, and codes used in the building industry and the sections that pertain to masonry; (L) explain the purpose of specifications, standards, and codes; and (M) describe the purpose of inspections and testing.	residential drawings. b. Explain how to use scales and dimensions in residential drawings. c. Explain how to interpret the various types of residential drawings.	
Mortar			The student learns to describe the ingredients and types of mortar. The student is expected to:		

			(A) explain the use of Portland cement, hydrated lime, and sand; (B) identify masonry cement; (C) explain pre-blended mortars; (D) explain the use of water and admixtures; (E) list the types of masonry mortars; (F) explain the properties of plastic mortar; (G) identify the properties of hardened mortar; (H) identify the common problems found in mortar application and their solutions; (I) describe the effects of improper proportioning and poor-quality materials; (J) explain the effects of severe weather and tempering;		
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			(K) describe efflorescence; (L) set up, maintain, and dispose of mortar; (M) maintain the mortar mixing area; (N) set up a mixing area; and (O) mix mortar with a power mixer.		
CMU			The student describes how to install concrete masonry units. The student is expected to: (A) identify the characteristics of concrete masonry units; (B) explain how to set up, layout, and bond concrete masonry units; (C) explain how to lay and tool concrete masonry units; (D) explain how to clean concrete masonry units; (E) identify the characteristics of brick;		

			(F) demonstrate how to set up, layout, and bond brick; (G) demonstrate how to lay and tool brick; (H) demonstrate how to clean brick; (I) cut with chisels and hammers; (J) cut with masonry hammers; (K) cut with saws and splitters; (L) check units and cuts; (M) install masonry reinforcements; and (N) install masonry accessories.		
Residential Masonry		Understand the construction techniques for residential and small structure foundations, steps, patios, decks, chimneys, and fireplaces.	Understand the construction techniques for residential and small structure foundations, steps, patios, decks, chimneys, and fireplaces. Student is expected to:		

			(A) explain the requirements for construction of various types of residential foundations; (B) Identify and explain the characteristics, uses, and installation techniques for clay brick and concrete pavers; (C) lay out and build steps, patios, and decks made from masonry units; and (D) explain how to lay out and build fireplaces and chimneys.		
Reinforced Masonry		Understand how grout and other types of reinforcement is used to strengthen and support masonry structures.	Understand how grout and other types of reinforcement, such as reinforcing steel, is used to strengthen and support masonry structures. Student is expected to: (A) identify and describe the primary ingredients in grout and how it is prepared;	Discuss the differences between coarse and fine aggregates. Discuss the difference between low-lift and high-lift grouting techniques. Discuss the importance of mortaring joints. Discuss the placement of rebar in reinforced walls. Compare and contrast reinforced walls and masonry	

			(B) describe how grout is placed; and (C) describe how to construct reinforced walls and masonry elements.	elements including the bond beams and bond beam lintels, precast lintels, and piers, pilasters, and columns.	
Masonry Openings		Understand the materials and techniques used to install masonry openings.	Understand the methods and materials used to install masonry openings and to tie wythes together and to structural elements. Student is expected to: (A) Describe how to use and install door and window frames, windowsills, lintels, and chases and recesses; (B) Describe materials used to tie masonry wythes together; and (C) Describe how to tie masonry wythes to other structural elements.	Demonstrate a variety of masonry installations techniques for openings: • hollow metal door frame • sill and a lintel • bearing plate • strap tie	
Advanced Laying Techniques		Practice advanced masonry laying techniques.	Apply advanced practice masonry techniques for walls, arches, and other	Identify the requirement for and function of control joints and expansion joints. a. Identify the effects of	

			structures. Student is expected to: (A) identify the structural principles and fundamental uses of basic types of walls including solid and hollow wall, cavity walls, composite walls, veneer walls, retaining walls and freestanding walls; (B) describe the effects of moisture and heat on join control; and (C) demonstrate various layout and construction techniques for corners and intersections.	temperature and moisture on control joints and expansion joints. b. Identify the uses of control joints. c. Identify the uses of expansion joints. Lay out and construct various corners and intersections. a. Lay out and construct toothing. b. Lay out and construct corbeling. c. Lay out and construct intersecting walls. d. Lay out and construct angled corners.	

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 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.