

Colorado CTE Course – Scope and Sequence

Course Name	Property Maintenance and Repair		Course Details	Course Credit: 1.0 Prerequisites: None	
			175 Periods 7,875 Minutes 130 Hours*		
Course Description	Students will gain knowledge in the basic needs of maintaining residential and commercial property. In addition to general safety, curriculum will include, but is not limited to, the following non-code topics: pouring and finishing a small concrete pad, framing and finishing walls, basic writing and electrical topics, mounting a toilet, changing a bath/kitchen fixture, sprinkler systems, changing door hardware, painting, installing roofing and fencing, and basic furniture repairs.				
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 #	17009	*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 (Samples of Performance Indicators)	CTSO Integration
Industry and Employment		Understand the nature and scope of the Architecture & Construction Career Cluster and the role architecture and construction play in society and the economy. Identify career options for maintenance and repair positions within various industries. Understand employment expectations for	The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: (A) express ideas and messages to others in a clear, concise, and effective manner, including explaining or conveying written information in a professional comprehensive manner; (B) compile data using numbers in various formats	Research and match career opportunities based upon their fit with personal career goals. <ul style="list-style-type: none"> • Locate and interpret career information for at least one career pathway within the cluster. • Identify job requirements for the career cluster/pathway. • Identify educational and credentialing requirements for careers within the cluster. 	SkillsUSA Framework

		<p>maintenance and repair professionals.</p>	<p>to solve job-appropriate problems; (C) demonstrate how to choose the ethical course of action and comply with all applicable rules, laws, and regulations; and (D) demonstrate punctuality, dependability, reliability, and responsibility consistently in reporting for duty and performing assigned tasks as directed.</p>	<ul style="list-style-type: none"> • Develop a personal career plan for advancement in the architecture and construction career pathway. <p>Review and discuss specific policies, procedures and protocols regarding discrimination, harassment and bullying.</p> <ul style="list-style-type: none"> • Discuss and/or role-play proper and respectful behavior that contributes to a positive climate. • Discuss and/or demonstrate behavior that contributes to a collaborative/teamwork environment. 	
<p>General Safety & Health Standards</p>		<p>Comply with regulations and applicable codes to establish and manage a legal and safe workplace/jobsite.</p> <p>Demonstrate appropriate health and safety practices based on the specific occupational area.</p>	<p>The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:</p> <p>(A) demonstrate safe working procedures during building maintenance and repair; (B) explain the purpose of the Occupational Safety and Health Administration (OSHA) and how to promote safety on a worksite;</p>	<p>Demonstrate safe dress and use of relevant safety gear, personal protective equipment (PPE) and ergonomics, e.g., wrist rests, adjustable workspaces, equipment, gloves, proper footwear, earplugs, eye protection and breathing apparatus.</p> <p>Demonstrate appropriate safe body mechanics, including appropriate lifting techniques and ergonomics.</p>	

			<p>(C) identify worksite hazards and how to avoid or minimize them on a worksite;</p> <p>(D) explain safety obligations of workers, supervisors, and managers to ensure a safe worksite;</p> <p>(E) discuss the causes, effects, impacts, and costs of accidents;</p> <p>(F) define safe work procedures for working with hazardous chemicals;</p> <p>(G) define proper use of personal protective equipment; and</p> <p>(H) identify potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces.</p>	<p>Pass shop safety exam with 100% knowledge demonstration.</p> <p>Read and discuss information on OSHA, EPA and other safety regulations. Complete OSHA training and receive certification.</p> <p>Identify, describe and apply Environmental Protection Agency (EPA) and other environmental protection regulations that apply to specific tasks and jobs in the specific occupational area. Given an industry scenario, elaborate on the considerations and actions a competent and ethical professional would demonstrate.</p> <p>Identify, describe and demonstrate the Universal Precautions set of guidelines. Describe and follow safe practices relating to environmental hazards.</p> <p>Identify workplace hazards common to design and construction situations. Explain the role of inspection in the workplace. Elaborate on the steps to pass job inspections and comply with regulations at all times.</p>	
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Tools and Measurement		<p>Apply construction skills when repairing, restoring, or renovating existing structures.</p> <p>Demonstrate tool and equipment operation according to current industry and OSHA standards.</p> <p>Identify and demonstrate techniques in the use of hand tools.</p> <p>Identify and demonstrate techniques in the use of power tools.</p>	<p>The student demonstrates how to use hand tools that are commonly used in the worksite such as hammers, saws, levels, pullers, and clamps. The student is expected to: (A) explain and demonstrate the specific applications and uses of hand tools; and (B) identify the important safety and maintenance requirements for hand tools.</p> <p>The student demonstrates how to use power tools that are commonly used in the worksite such as drills,</p>	<p>Students will identify and be able to demonstrate the operation of construction tools and equipment to include, but not limited to, hammers, saws, levels, puller, clamps, drills, grinders, sanders, etc. Students will identify specific regulations and maintenance requirements for construction related equipment and tools.</p> <p>Students demonstrate industry approved techniques in the use of tools to complete a given project (e.g., ripping and crosscutting on a power operated table saw).</p>	

		Identify and demonstrate the use of layout and measuring devices, including levels.	grinders, saws, and sanders. The student is expected to: (A) explain and demonstrate appropriately the specific applications and uses of power tools; and (B) identify the important safety and maintenance requirements for power tools.	Demonstrate the safe use, storage, and maintenance of every piece of equipment in the lab, shop and classroom, e.g., the OSHA Lockout/Tagout Program (LOTO). Demonstrate methods used to maintain hand and power tools including sharpening, oiling and cleaning.	
Maintenance Schedules		Plan and practice preventative maintenance activities to service existing structures. Maintain and inspect building systems to achieve safe and efficient operation of facilities.	The student understands aspects of scheduled maintenance, including inspections, adjustments, regular service and planned shutdowns. The Student will be able to: (A) Identify the components of a maintenance plan and associated schedules; (B) state the importance of regularly identified maintenance; and (C) identify and perform basic preventative maintenance for the following: I. Furnace II. Thermostat III. Filters IV. Blower belts and/or bearings V. Lighting	Demonstrate building maintenance skills: <ul style="list-style-type: none"> • Perform maintenance on an air filter system including checking oil and belts and replacing filters. • Demonstrate basic procedures to troubleshoot common problems in heating and cooling systems. • Define and demonstrate how to clean and maintain heating and air conditioning systems according to current industry standards. • Demonstrate methods used to maintain lighting fixtures including replacing bulbs. 	

				Explain the importance of scheduled maintenance.	
Blueprints		Read, interpret and use technical drawings, documents and specifications.	<p>The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:</p> <p>(A) describe the types of drawings usually included in a set of plans and list the information found on each type;</p> <p>(B) identify the different types of lines used on blueprint drawings;</p> <p>(C) identify and describe the unique properties of a variety of blueprints including carpentry, plumbing, electrical, fire protection and sheet metal;</p> <p>(D) identify selected architectural symbols commonly used to present materials on plans;</p> <p>(E) identify selected abbreviations commonly used on plans;</p> <p>(F) read and interpret plans, elevations, schedules, sections, and details</p>	<p>Interpret given drawing dimensions. Recognize elements and symbols of blueprints and drawings.</p> <p>Use specifications and standards. For example, students will assemble shelving units following manufacturer's instructions and diagrams.</p> <p>Sketch/draw/illustrate concepts and ideas. Draw or sketch plan/layout to be completed.</p> <p>Use proper measurements to determine layout.</p>	

			<p>contained in basic construction drawings; and (G) follow diagrams for installation of equipment.</p>		
<p>Basic Building Maintenance and Materials</p>		<p>Determine work required to perform basic repairs for buildings or apartments.</p> <p>Identify common building materials and their application.</p> <p>Explore new technologies in building and maintenance related to Green Building Technologies, Energy Efficiency or Pest Management.</p>	<p>Student performs basic mechanical maintenance tasks associated with maintaining apartment and commercial properties. The student is expected to:</p> <p>(A) identify jobs requiring licensed professionals (i.e., electricians, pipefitters, plumbers and sheet metalworkers);</p> <p>(B) identify hardware and building materials and describe their use;</p> <p>(C) define lubrication and explain how a lubricant reduces wear and dampens shock;</p> <p>(D) identify types of threaded fasteners;</p> <p>(E) read and interpret common screw thread and threaded fastener specifications;</p> <p>(F) Identify three kinds of washers and their applications;</p> <p>(G) identify types of wood used for building and repair projects;</p> <p>(H) describe the uses of brick, masonry, steel, plaster and glass for building and repair projects;</p>	<p>Identify fasteners and describe their use (e.g., screws, nails, bolts, nuts, washers, clamps, anchors and clips).</p> <p>Identify types of wood used for building and repair projects (e.g., plywood, dimensional lumber, treated lumber, flooring and specialty woods).</p> <p>Identify basic building materials and supplies required for common building repairs. (Varies by type of repair- Extensive lists are referenced in several building construction specific pathway course scope and sequence documents.)</p> <p>Investigate new building material that have come on the market. Report on the advantages and disadvantages of their cost, use, and application.</p> <p>Explore green technologies and cleaners. Examine their role in the industry and use in local applications or by local employers.</p>	

			(I) explore new topics in building materials, building energy efficiency, or pest management.	List the elements of an Integrated Pest Management plan for both interior and exterior structures. Compare and contrast Integrated Pest Management with traditional pest management.	
Wall, Door, Trim and Finish Work		<p>Identify types of wood used for building and repair projects (e.g., plywood, dimensional lumber, treated lumber, flooring and specialty woods)</p> <p>Demonstrate maintenance and repair techniques for brick, masonry, steel, plaster and glass for building and apartment repair projects.</p>	<p>The student knows various types of repair techniques for alteration, preparation, painting and repair of structures made of wood, plaster, concrete or brick. Student is expected to:</p> <p>(A) install and repair drywall; (B) demonstrate preparation and application skills for painting and finishing projects. (C) install acoustical ceiling tiles; (D) install and repair doors and door parts; (E) install and repair lock sets and door closers; (F) install and repair shelving units; and (G) install and repair wood trim.</p>	<p>Install drywall or perform a repair to a hole in a sheetrock wall.</p> <p>Demonstrate how to change out a deadbolt in a door.</p> <p>Demonstrate preparation and application skills for painting and finishing projects.</p> <p>Define the chemical properties of paints, stains and finishes.</p> <p>Identify tools and equipment specific to painting and finishing projects.</p> <p>Prepare surfaces (i.e., walls, ceilings, wood, masonry and metal) for the application of paint and other finishes.</p> <p>Apply paint, stain and other finishes to various surfaces (i.e., drywall, plaster, wood, masonry and metal) using brushes and rollers.</p>	

				<p>Apply paint, stain and other finishes to various surfaces (i.e., drywall, plaster, wood, masonry and metal) using spray equipment.</p> <p>Determine type and quantity of materials required for a given project.</p> <p>Demonstrate proper equipment clean up and storage according to current industry and OSHA standards.</p>	
Flooring Cleaning and Repairs		Apply skills in flooring cleaning, repair and replacement.	<p>The student identifies, cleans, and repairs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:</p> <p>(A) describe the methods used to install ceramic tile, carpet, and vinyl tile;</p> <p>(B) demonstrate carpet and floor care using appropriate equipment (e.g., steam cleaners, floor machines);</p> <p>(C) make repairs to ceramic tile, carpet, and vinyl tile; and</p> <p>(D) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives.</p>	<p>Demonstrate repair methods for a variety of flooring surfaces:</p> <ul style="list-style-type: none"> • Replace ceramic tiles, carpeting, and vinyl tile • Repair wood flooring, baseboard, and trim. <p>Demonstrate carpet and floor care using appropriate equipment (e.g., steam cleaners, floor machines).</p>	

Basic Electrical Repair		Understand and apply concepts and technical skills related to electrical systems and components.	The Student is expected to be able to identify and make basic repair to electrical components and systems: (A) identify the types of electrical systems found in residential and commercial buildings; (B) identify various codes; (C) explain basic components found in an electrical system; (D) demonstrate the ability to check circuit breakers; and (E) demonstrate the ability to wire lighting fixtures.	Determine the procedures necessary to safely replace or install electrical devices in a device box, such as a light fixture, receptacle, or switch. Describe safety practices and procedures to be followed when working with and around electricity, e.g., ground fault circuit interrupter (GFCI) and frayed wiring.	
Basic Plumbing Repair		Apply knowledge and technical skills for plumbing repairs.	Student will be able to perform the following types of common plumbing repairs and maintenance: (A) water closet repair; (B) localized stoppages; (C) disposals; (D) P-Traps; (E) floor drains; and (F) faucet repair or replacement.	Demonstrate basic plumbing repairs. <ul style="list-style-type: none"> • Repair faucets by installing washers or seats and springs. • Clear stoppages in drains and in toilets. 	
Basics of HVAC		Explain the basic principles of heating, ventilating, and air conditioning & refrigeration systems.	The student is expected to display a basic understanding of HVAC systems and how they work by being able to: (A) describe the purpose and operation of the various electrical components used in HVAC equipment; (B) state and demonstrate the safety precautions that	Demonstrate understanding of basic HVAC components and systems. Demonstrate basic procedures to troubleshoot common problems in heating and cooling systems.	

			<p>must be followed when working on electrical equipment;</p> <p>(C) make voltage, current, and resistance measurements using electrical test equipment; and</p> <p>(D) read and interpret common electrical symbols. Students will be able to identify the proper type of piping, tubing, and supports for plumbing projects. Students will describe procedures and precautions that must be taken when preparing and installing HVACR piping.</p>		
Weatherization, Insulation, and Waterproofing		Understand the concept and applications of weatherization for commercial properties.	<p>The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:</p> <p>(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials;</p> <p>(B) Demonstrate interior and exterior caulking; and</p>		

