

Colorado CTE Course – Scope and Sequence

Course Name	Heating, Ventilation and Air Conditioning (HVAC) Technology		Course Details	Credit= 1.0 Prerequisite: Principles of Construction or Mechanical, Electrical and Plumbing Systems CTE Credentials: CTE Construction and Architecture; CTE Manufacturing	
			Course = 0.50 Carnegie Unit Credit		
Course Description	In Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Technology I, students will gain knowledge and skills needed to enter the industry as technicians in the HVAC and refrigeration industry or building maintenance industry, prepare for a postsecondary degree in a specified field of construction management, or pursue an approved apprenticeship program. Students will acquire knowledge and skills in safety, principles of HVAC theory, use of tools, codes, and installation of HVAC and refrigeration equipment. Focuses on the installation of common piping materials in plumbing and HVAC/R systems. Covers pipe math, terminology, common piping materials and application, figuring offsets and common pipe joints. Shop projects including pipe support and hanging, center to center measurements and a variety of pipe joining methods are explored.				
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 #	17055	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	Practice safe work habits. Student is expected to: (A) Interpret policies, procedures, and regulations for the workplace environment, including employer	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	

		<p>Building and Construction Trades sector workplace environment</p>	<p>and employee responsibilities.</p> <p>(B) use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.</p> <p>(C) set up a work area, or shop, to avoid potential health concerns and safety hazards, including but not limited to electrical (shock), wires (tripping), fumes (lung health), noise (hearing loss), fire (burns), and so forth, incorporating ergonomics.</p> <p>(D) maintain a safe and healthful working environment; and</p> <p>(E) comply with the safe handling, storage and disposal of chemicals, materials and adhesives in accordance with local, state, and federal safety and environmental regulations (OSHA, Environmental Protection Agency [EPA], Hazard</p>	<p>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 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.</p> <p>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</p>	
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			<p>Communication [HazCom], Safety Data Sheets [SDS], etc.).</p>	<p>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 power tools, ladders, scaffolding, and lifting equipment. Complete safety test with 100 percent accuracy.</p> <p>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 HVAC work, including working around refrigerants, oils, and gases.</p>	
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<p>Career development</p>		<p>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 HVAC/R trade</p>	<p>The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:</p> <p>(A) identify job opportunities with their accompanying job duties in occupations such as HVAC technician, building maintenance technician or manager, and HVAC inspector; and</p> <p>(B) research career pathways along with the education, job skills, and experience required to achieve a career goal.</p>	<p>Continually reflect on coursework experiences and revise and refine the career plan generated in prior courses.</p> <p>Create a portfolio of work accomplished. Include photographs or illustrations and written descriptions of sequential progress in construction projects.</p> <p>Research local job and internship opportunities and requirements. Update resume and practice job interview skills.</p>	<p>Updates to ICAP</p> <p>SkillsUSA Personal and Employability Skills Framework</p> <p>SkillsUSA HVAC Competition</p>
<p>HVAC Tools</p>		<p>Select and use tools and equipment appropriately for heating, air-conditioning, and refrigeration service and repair applications.</p>	<p>Use HVAC tools appropriately. Student is expected to:</p> <p>(A) identify and select the proper tools and accessories,</p> <p>(B) critique the readiness of the tools,</p> <p>(C) use the tools to accomplish the desired tasks, and</p>	<p>Research a new technology recently developed for the HVAC industry. Write persuasively to convince an employer how the use of the technology could benefit the company, citing evidence from resources. For example, describe how a new tool could improve work efficiency for an HVAC technician.</p>	

			<p>(D) return tools and accessories to their proper storage.</p>	<p>Demonstrate safe use of common HVAC Tools: (Examples) Multimeter(s) (both digital and analog if available), Voltage tester, Clamp-on, ammeter, Breadboards, Assorted hand tools used to disassemble and/or gain access to components, Gauge and/or manometer, Temperature measurement instruments, Refrigeration gauge sets, Pocket screwdrivers, various wrenches, Handheld tubing cutters Hacksaws, Reaming tools, Bending springs, Handheld tubing benders, Flaring tool sets, Flare nut wrenches, Swaging tools, Various solders</p>	
<p>HVAC Industry Regulations and Practices</p>		<p>Understand the basic principles of heating, air-conditioning, and refrigeration.</p>	<p>The student learns the basic principles of HVAC and refrigeration. The student is expected to:</p> <p>(A) explain the basic principles of HVAC; (B) describe the basic components and concepts of heating, air-conditioning, and refrigeration; (C) describe what the Clean Air Act means</p>	<p>Locate and assess requirements for performing HVAC work including local, state, and national requirements. Interpret HVAC codes, and determine inspection procedures and other applicable portions of the law. Visit the Colorado DORA Licensing Board’s website and analyze its policies and requirements. Explain how such policies</p>	

			<p>to the HVAC and refrigeration industry</p> <p>(D) describe the purpose and importance of local, state, and federal heating, air conditioning, and refrigeration codes and standards.</p>	<p>impact local construction businesses.</p> <p>Consult a variety of sources to describe alternatives to traditional project delivery methods, such as the design-build and construction management-related methods, distinguishing among the roles and relationships of various construction personnel in each scenario. Examine the project delivery method of an actual company. Develop a company profile with supporting graphics the company could share with a client, describing the services provided and explaining the project delivery method used by the company.</p>	
HVAC and Electricity		<p>Demonstrate a practical knowledge of basic electricity and skills necessary to service and maintain the electrical components of heating, air-conditioning, and refrigeration equipment.</p>	<p>The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:</p> <p>(A) explain how electrical power is distributed;</p> <p>(B) describe how voltage, current,</p>	<p>Building on knowledge of electricity from Mechanical, Electrical, and Plumbing Systems or Principles of Construction, describe the functions of electrical components used in HVAC systems. Examine an electrical diagram of an HVAC system and interpret symbols to describe the system, distinguishing between load devices and control devices. For example, annotate a basic</p>	

			<p>resistance, and power are related;</p> <p>(C) calculate the current, voltage, and resistance in a circuit using Ohm's law;</p> <p>(D) calculate how much power is consumed by a circuit using the power formula;</p> <p>(E) describe the differences between series and parallel circuits and calculate loads in each;</p> <p>(F) describe the purpose and operation of the various electrical components used in HVAC equipment;</p> <p>(G) state and demonstrate the safety precautions that must be followed when working on electrical equipment;</p> <p>(H) make voltage, current, and resistance measurements using electrical test equipment; and</p> <p>(I) read and interpret common electrical symbols.</p>	<p>HVAC electrical diagram to explain the purpose and function of each component in the overall system to an entry-level HVAC technician.</p>	
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<p>Heating Systems</p>		<p>Demonstrate an understanding of the scientific theories and physical properties of heat and matter.</p> <p>Apply information on HVAC heating systems for installation, maintenance, and repair services.</p>	<p>The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:</p> <ul style="list-style-type: none"> (A) explain the three methods by which heat is transferred and give an example of each; (B) describe how combustion occurs and identify the by-products of combustion; (C) identify the various types of fuels used in heating; (D) identify the major components and accessories of an induced draft and condensing gas furnace and explain the function of each component; (E) describe the factors that must be considered when installing a furnace; (F) identify the major components of a gas 	<p>Building on knowledge of heat transfer from Mechanical, Electrical, & Plumbing Systems, describe the processes by which heat loss calculations are made for a residence. Describe a variety of ways in which heat is lost and why it is important for HVAC professionals to know how to perform heat loss calculations. For a given residence, follow procedures to perform a basic heat loss calculation for a residence with a given u-value and location.</p> <p>Analyze various types of gas furnaces and explain how they operate. Describe the equipment and controls involved, the concept of combustion, the various gas fuels, and their combustion characteristics. Explain the proper procedures for installing and maintaining gas furnaces. Perform basic maintenance tasks on a gas furnace, including replacing air filters and measuring temperature.</p> <p>Compare and contrast gas furnaces, hydronic heating systems, and electric heating</p>	
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			<p>furnace and describe how each works;</p> <p>(G) use a manometer under supervision to measure and adjust manifold pressure on a gas furnace;</p> <p>(H) identify the major components of an oil furnace and describe how each component works; and</p> <p>(I) perform furnace preventive maintenance procedures such as cleaning and filter replacement under supervision.</p>	<p>systems by analyzing the operating procedures and pros and cons of each system. Write a recommendation for a heating system for a client with a given location and building type. Cite evidence from retail catalogues, manufacturers' specifications, and energy ratings to justify the recommendation, defending why the selected system is a better choice than an alternative solution.</p>	
Cooling Systems		<p>Demonstrate a working knowledge of the four major components of a refrigeration system.</p> <p>Analyze the effects and reactions of fluids, pressures, and temperatures on refrigerants.</p>	<p>The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:</p> <p>(A) explain how heat transfer occurs in a cooling system, demonstrating an understanding of the terms and concepts</p>	<p>Describe the relationship between temperature and pressure and relate it to use of refrigerant in cooling systems. Distinguish between absolute pressure and gauge pressure. Summarize the processes involved in the basic mechanical refrigeration cycle, including the changes of state that occur and the basic patterns of the refrigerant flow. Analyze the major components of cooling systems and how they function, including compressors, condensers,</p>	

			<p>used in the refrigeration cycle;</p> <p>(B) calculate the temperature and pressure relationships at key points in the refrigeration cycle;</p> <p>(C) under supervision, use temperature- and pressure-measuring instruments to make readings at key points in the refrigeration cycle;</p> <p>(D) identify the major components of a cooling system and explain how each type works;</p> <p>(E) identify the major accessories available for cooling systems and explain how each works;</p> <p>(F) identify the control devices used in cooling systems and explain how each works; and</p> <p>(G) demonstrate the correct methods to be used when piping a refrigeration system.</p>	<p>evaporators, and controls. Draw evidence from textbooks, professional journals, and instructional websites to produce an explanation of the refrigerant cycle and the functioning processes of cooling systems in a written narrative with supporting graphics.</p> <p>Utilize common measurement instruments including thermometers and gauge manifolds to measure temperature and pressure in an operating cooling system. Demonstrate the ability to calibrate a set of refrigerant gauges and thermometers, connect a refrigerant gauge manifold, and properly calculate subcooling and superheat on an operating system using the gauge manifold and a temperature probe.</p>	
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<p>Refrigerant Handling</p>		<p>Practice proper methods of storing, transferring, and recovering refrigerants.</p>	<p>Student understands the properties of refrigerant and demonstrates proper handling and disposal. Student is expected to:</p> <p>(A) identify commonly used refrigerants and demonstrate the procedures for handling these refrigerants; and</p> <p>(B) describe the strategies and equipment used to leak test refrigerant circuits.</p>	<p>Building on knowledge from Mechanical, Electrical, & Plumbing Systems or Principles of Construction, describe the impact of refrigerants on the environment and the laws and regulations that are in place to protect the environment, such as the Montreal Protocol, the Clean Air Act, and EPA technician certification requirements.</p> <p>Distinguish among the various types of refrigerant, identifying the properties and cylinder color codes of each type. Read and interpret safety precautions and regulations impacting the recovery, containment, handling, and disposal of refrigerants, including EPA regulations, manufacturer's technical bulletins and MSDSs, and transportation requirements established by the U.S. Department of Transportation (DOT), analyzing how requirements are structured in the text. For example, evaluate the condition of a refrigerant container and determine if it meets DOT requirements, including proper labeling.</p>	
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				<p>Interpret unresolved or inadequately documented information.</p> <p>Describe the strategies and equipment used to leak test refrigerant circuits. Apply the appropriate tools, equipment, and procedures to safely pressurize a refrigerant system in preparation for leak testing and leak test the pressurized system.</p> <p>Explain the various procedures used to recover, recycle, and reclaim refrigerant from equipment. Read and interpret technical documents to determine the required recovery level of a given HVAC system. Apply the appropriate tools, equipment, and procedures to safely perform refrigerant-recovery techniques while adhering to applicable regulations, including applying proper labeling and maintaining accurate records. Interpret and implement regulations surrounding the recycling, reclaiming, and disposing of refrigerant.</p> <p>Evaluate the purpose and procedures of system</p>	
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				<p>evacuation of an air conditioning system. Describe steps for selecting the appropriate tools to perform an evacuation for a given system. Compare and contrast common methods of evacuation such as deep vacuum and triple evacuation. Apply the appropriate tools, equipment, and procedures to safely perform a system evacuation.</p> <p>Explain and demonstrate how to properly charge various types of refrigerant circuits using different methods including by weight, by superheat, and by subcooling, safely employing the appropriate, tools, equipment and procedures.</p>	
<p>Air Distribution Systems</p>		<p>Demonstrate practical knowledge of systems designed to improve air quality.</p>	<p>The student gains knowledge and skills related to air distribution systems. The student is expected to:</p> <ul style="list-style-type: none"> (A) describe the airflow and pressures in a basic forced-air distribution system; (B) explain the differences between propeller and centrifugal fans and blowers; 	<p>Describe the physical principles involved in air distribution systems, including pressure, velocity, and volume. Recognize the various types and properties of mechanical equipment that make up an air distribution system, including various blowers, fans, duct materials, grilles, registers, and dampers. Analyze the design of a simple air distribution system (i.e., as found in a typical residence)</p>	

			<ul style="list-style-type: none"> (C) identify the various types of duct systems and explain why and where each type is used; (D) demonstrate or explain the installation of metal, fiberboard, and flexible duct; (E) demonstrate or explain the installation of fittings and transitions used in duct systems; (F) demonstrate or explain the use and installation of diffusers, registers, and grilles used in duct systems; (G) demonstrate or explain the use and installation of dampers used in duct systems; (H) demonstrate or explain the use and installation of insulation and vapor barriers used in duct systems; (I) identify the instruments used to make measurements in air systems and 	<p>and explain how the system functions, noting where physical principles can be observed. Create a visual display with supporting text to explain the functions of the system.</p> <p>Research the purpose and importance of ventilation in modern HVAC systems. Use technology to create a brochure an HVAC technician could share with a client to illustrate the impact of proper ventilation on indoor air quality including services provided by the technician and steps the client can take to insure high indoor air quality.</p> <p>Illustrate how the design and proper installation of an air distribution system impacts the energy efficiency of the system. Drawing on observations, supporting technical manuals, and resources such as those from the U.S. Green Building Council and EPA Energy Star, create an oral or written recommendation for a client outlining strategies to increase energy efficiency for the HVAC system in a given</p>	
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			<p>explain the use of each instrument; and</p> <p>(J) make accurate temperature, air pressure, and velocity measurements in an air distribution system.</p>	<p>building, such as properly sealing the ducts, dampers, and vent locations.</p> <p>Utilize test equipment including tachometers, manometers, and velometers to analyze the performance of an air distribution system. For example, collect measurements with a velometer, apply the information to calculate the airflow volume in a duct, and report the findings using appropriate units. Read and interpret equivalent length charts and required air volume and duct size charts.</p>	
Basic Copper & Plastic Piping		Demonstrate skills necessary to fabricate and service the tubing, piping, and fittings utilized in accordance with accepted industry standards.	<p>The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:</p> <p>(H) state the precautions that must be taken when installing refrigerant piping;</p> <p>(I) select, cut, and bend the right copper tubing for the job;</p> <p>(J) safely connect tubing, using flare and compression fittings;</p> <p>(K) determine the correct hardware and</p>	<p>Distinguish among different types of plastic pipe, fittings, and valves for use in HVAC, and select the correct support and spacing for HVAC plastic piping. Compare and contrast the tools, hazards, and procedures for cutting and joining various types of plastic pipe. Employ tools and procedures to safely measure, cut, and join plastic piping and fittings for HVAC.</p> <p>Describe the properties of various types of copper tubing used for HVAC. Describe common fittings, hangers, and</p>	

			<p>supports needed for refrigerant pipe installations;</p> <p>(L) describe the basic requirements needed to identify and install various types of plastic pipe and state their uses;</p> <p>(M) demonstrate various methods used to pressure test HVAC systems;</p> <p>(N) identify types of plastic pipe and state their uses; and</p> <p>(O) cut and join lengths of plastic pipe.</p>	<p>supports used in copper tubing. Demonstrate how to measure, cut, and bend copper tubing for HVAC systems while preparing the tubing to be joined. Demonstrate techniques for mechanically joining copper tubing, including flared connections compression connections. Prepare tubing for soldering and brazing by swaging, deburring, and cleaning a tube. Inspect completed joints by safely performing leak testing procedures.</p>	
Soldering and Brazing		Demonstrate the ability to identify and select the appropriate materials for the soldering and brazing of tubing.	<p>The student cuts, threads, and joins ferrous piping. The student is expected to:</p> <p>(A) assemble and operate the tools used for soldering;</p> <p>(B) prepare tubing and fittings for soldering;</p> <p>(C) identify the purposes and uses of solder and solder fluxes;</p> <p>(D) solder copper tubing fittings;</p> <p>(E) assemble and operate the tools used for brazing;</p>	<p>Explain the purpose and process of soldering and brazing for an HVAC professional, outlining how the techniques work. Compare and contrast soldering and brazing, noting the uses, procedures, and equipment for each. Distinguish among the purposes, types, and uses of a variety of filler alloys and fluxes used in soldering and brazing, drawing on evidence from textbooks, manuals, and technical specifications to support claims.</p>	

			<p>(F) prepare tubing and fittings for brazing;</p> <p>(G) identify the purposes and uses of filler metals and fluxes used for brazing;</p> <p>(H) braze copper tubing and fittings;</p> <p>(I) identify the inert gases that can be used safely to purge tubing when brazing;</p> <p>(J) identify the types of ferrous metal pipes;</p> <p>(K) accurately measure the sizes of ferrous metal pipes;</p> <p>(L) identify the common malleable iron fittings;</p> <p>(M) cut, ream, and thread ferrous metal pipe;</p> <p>(N) join lengths of threaded pipe together and install fittings;</p> <p>(O) describe the main points to consider when installing pipe runs; and</p> <p>(P) describe the methods used to join grooved piping.</p>	<p>Describe the tools, equipment, and PPE used for soldering and brazing. Explain the safe operation of soldering and brazing equipment including assembling, testing, lighting, and shutting down acetylene and oxyacetylene equipment. Safely set up and shut down an acetylene single tank and oxyacetylene equipment. Describe and demonstrate procedures to safely prepare, solder, and braze copper tubing using various fittings.</p> <p>Implement safe procedures to complete copper, brass, and steel tubing assemblies for a given layout. Steps include measuring, cutting, and fitting assemblies; choosing the proper filler alloys and fluxes for the assigned job; demonstrating proper use of acetylene and oxyacetylene equipment; and pressure testing assemblies to determine the proper completion of assemblies.</p>	
Carbon Steel Piping		Demonstrate skills necessary to fabricate and service the tubing, piping, and fittings	Use information on carbon steel piping for HVAC maintenance, installation, or repair	Describe the characteristics and uses of steel pipe, making note of the similarities and differences in steel piping,	

		<p>utilized in accordance with accepted industry standards.</p>	<p>services. Student is expected to:</p> <ul style="list-style-type: none"> (A) understand the physical properties of steel piping; and (B) compare and contrast steel piping properties and installation techniques. 	<p>plastic piping, and copper tubing. Draw on evidence from textbooks and physical observations to support claims.</p> <p>Analyze the classification and measurement of pipe threads. Describe the uses of different types of fittings used on steel pipe. Employ tools and procedures to safely measure, cut, thread, and ream steel pipe.</p> <p>Explain and demonstrate the methods of installing, connecting, and mechanically joining steel pipe, including joining threaded pipe using fittings, pipe grooving methods, and assembling flanged steel pipe.</p>	
<p>Basic Repair and Maintenance</p>		<p>Identify routine maintenance and basic repairs for the HVAC industry.</p> <p>Demonstrate the skills necessary to service, maintain, and repair heating, air-conditioning, and refrigeration system components and accessories.</p>	<p>Student is expected to:</p> <ul style="list-style-type: none"> (A) use problem-solving strategies for determining appropriate HVAC repair processes; and (B) identify routine maintenance for HVAC systems. 	<p>Identify and demonstrate basic troubleshooting strategies appropriate for evaluating HVAC systems, appliances, and devices. For example, develop and implement a troubleshooting strategy to test and remedy an undercharged system.</p> <p>Identify routine maintenance procedures that should be performed on HVAC systems for a given building. Create a</p>	

				<p>timeline of recommended maintenance procedures for a client, justifying why each procedure is necessary by highlighting its preventive or cost-efficient characteristics. For example, create a schedule of items to inspect, clean, and replace in order to keep an HVAC system running efficiently.</p>	
Blueprints and Specifications		<p>Use construction blueprints and drawings to complete HVAC construction projects.</p> <p>Apply mathematics as they relate to HVAC applications.</p>	<p>Understand and apply construction drawings and blueprints to HVAC applications. Student is expected to:</p> <ul style="list-style-type: none"> (A) identify the types of schedules and drawings used by the HVAC and refrigeration industry; (B) understand HVAC drawings and symbols; and (C) understand the relationship between construction drawings and specifications for HVAC. <p>The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of</p>	<p>Explain the relationship between construction drawings and specifications. Describe how both the construction drawings and specifications provide information about the HVAC system for a building. For example, examine construction drawings and specifications to determine the requirements for hangers and supports in a given HVAC piping system.</p> <p>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</p>	

			<p>refrigeration. The student is expected to:</p> <ul style="list-style-type: none"> (A) identify similar units of measurement in both English and the International System (SI) of units; (B) calculate and convert measured values and volumes expressed in mathematical equations and formulas; and (C) convert temperature values between Celsius and Fahrenheit. 	<p>detail of the construction documents, such as the selection of a product.</p>	
Business and Project Management Practices		<p>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.</p> <p>Understand best practices for managing business communications and projects.</p>	<p>Apply knowledge of business industry practices. Student is expected to:</p> <ul style="list-style-type: none"> (A) investigate business practices for contract services; and (B) identify common practices for effective communication in the workplace for individuals and teams. 	<p>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 HVAC service agreement for work done for a residential client.</p> <p>Establish and implement specific goals to manage project assignments in a timely manner, including organizing teams to effectively manage assignments,</p>	

				<p>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>Interpret construction drawings and diagrams to determine the correct materials, tools, and equipment needed to complete an HVAC project. Plan and implement the steps needed to complete the project, adhering to inspection procedures and employing safe practices throughout. Draw from print and electronic examples to create a material list, cost estimation, schedule, and inspection checklist for a project, applying the components of the documents to the given project.</p> <p>Produce clear and coherent writing for communication in</p>	
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