



Related NCCER Modules by Course Standard

The National Center for Construction Education and Research (NCCER) develops and publishes curriculum in construction craft areas. Students who successfully complete the NCCER curriculum through an NCCER Accredited Training Sponsor may obtain NCCER credentials and have their name included in the NCCER National Registry. For information on the NCCER Curriculum and establishing an NCCER Accredited Training and Education Facility (ATEF), please visit www.nccer.org.

The following provides an outline of the course standards correlated with modules from the National Center for Construction Education and Research (NCCER).

Fundamentals of Construction

Section	Standard	NCCER Module
Safety	1 Identify safety hazards on a jobsite and demonstrate practices for safe working conditions. Accurately read, interpret, and demonstrate adherence to safety...	Core Curriculum: 00101-09 Basic Safety
Safety	2 Define and demonstrate adherence to industry-standard practices regarding general machine safety, tool safety, equipment safety, electrical safety, and...	Core Curriculum: 00101-09 Basic Safety
Safety	3 Follow procedures to work safely around materials. Adhere to responsibilities for employees in material safety as outlined by the Hazard Communication...	Core Curriculum: 00101-09 Basic Safety 00109-09 Introduction to Materials Handling
Introduction to the Construction Industry	5 Drawing on resources from textbooks, websites, and research centers such as the National Center for Construction Education and Research (NCCER),...	Optional Supplement- Project Management: 44101-08 Introduction to Project Management
Introduction to Measurement	10 Use physical measurement devices typically employed in construction to complete accurate field measurements. Determine the appropriate units...	Core Curriculum: 00102-09 Introduction to Construction Math
Introduction to Measurement	11 Interpret given linear and angular dimensions to accurately set up layouts to complete a project. For example, use an architect's scale to measure...	Core Curriculum: 00102-09 Introduction to Construction Math

Construction Math	12	Apply mathematics concepts to solve construction problems, distinguishing which principles apply to a given construction problem. Concepts...	Core Curriculum: 00102-09 Introduction to Construction Math
Tools & Equipment	13	Accurately identify a wide range of hand and power tools used in the construction trades, such as striking tools, cutting tools, torque producing...	Core Curriculum: 00103-09 Introduction to Hand Tools 00104-09 Introduction to Power Tools
Tools & Equipment	14	Assess a variety of situations requiring the use of hand tools, power tools, and equipment. Select the proper tool and accessories, critique...	Core Curriculum: 00103-09 Introduction to Hand Tools 00104-09 Introduction to Power Tools
Introduction to Building Systems and Materials	17	Using graphic illustrations and supporting text, identify and describe major building systems (i.e. foundation, structural, mechanical, electrical...	Core Curriculum: 00105-09 Introduction to Construction Drawings
Construction Drawings & Specifications	18	Inspect and interpret construction drawings, diagrams, and written specifications for construction projects. Explain how pictorial...	Core Curriculum: 00105-09 Introduction to Construction Drawings
Construction Drawings & Specifications	19	Describe the purpose of specifications in a construction document set. Examine how specifications are organized according to the Construction...	Optional Supplement- Project Management: 44105-08 Construction Documents
Course Project	21	Interpret construction drawings to determine the correct materials, tools, and equipment needed to complete a basic construction...	Core Curriculum: 00105-09 Introduction to Construction Drawings

While not directly aligned to one specific standard, the following additional modules should be covered for students to complete the NCCER Core Curriculum certification:

- 00107-09 Basic Communication Skills
- 00108-09 Basic Employability Skills
- 00106-09 Basic Rigging (optional)



Residential & Commercial Construction I

Section	Standard	NCCER Module
Site Layout	9 Describe the basic procedures by which surveyors create site drawings. Read and interpret a site drawing to determine the steps, personnel,...	Construction Technology: 68101-09 Site Layout One: Distance Measurement and Leveling
Site Layout	10 Apply the appropriate mathematical principles, tools, equipment, and procedures to accurately lay out a site, including: a. Estimating distances by...	Construction Technology: 68101-09 Site Layout One: Distance Measurement and Leveling
Foundation Systems and Properties of Concrete	11 Draw on construction texts and other technical documents to compare and contrast types of foundation systems and footings. Create a written ...	Construction Technology: 68102-09 Introduction to Concrete, Reinforcing Materials, and Forms
Foundation Systems and Properties of Concrete	12 Describe the composition of concrete by listing the materials used to make concrete. Analyze the factors that impact the compression strength...	Construction Technology: 68102-09 Introduction to Concrete, Reinforcing Materials, and Forms
Foundation Systems and Properties of Concrete	13 Calculate the total volume of concrete and the specific materials necessary for a given project based on construction drawings and...	Construction Technology: 68102-09 Introduction to Concrete, Reinforcing Materials, and Forms
Foundation Systems and Properties of Concrete	14 Analyze factors influencing the curing of concrete, such as the weather, moisture, and the use of control joints. For example, write an explanatory...	Optional Supplement- Construction Technology: 68103-09 Handling and Placing Concrete
Foundation Systems and Properties of Concrete	15 Apply the appropriate tools, equipment, and procedures to safely place concrete and cleanup after a concrete project. Work in teams to safely...	Construction Technology: 68102-09 Introduction to Concrete, Reinforcing Materials, and Forms
Framing Systems Overview	16 Distinguish among the basic types of wood framing systems, such as platform frames, balloon frames, and post-and-beam frames. Create...	Construction Technology: 68106-09 Floor Systems
Floor Framing Systems	17 Identify the components which make up a floor frame, analyzing the purpose of and interrelationships among each component...	Construction Technology: 68106-09 Floor Systems



Floor Framing Systems	18	Read and interpret construction drawings to determine floor system requirements such as the proper girder and joist size for a given span...	Construction Technology: 68106-09 Floor Systems
Floor Framing Systems	19	Describe the procedures necessary to fasten sills to the foundation and construct a floor assembly. Apply the appropriate tools, equipment,...	Construction Technology: 68106-09 Floor Systems
Wall and Ceiling Framing Systems	20	Explain the procedure to lay out a wood frame wall, defining and describing the components such as plates, studs, partitions, door and window...	Construction Technology: 68107-09 Wall and Ceiling Framing
Wall and Ceiling Framing Systems	21	Read and interpret drawings to determine wall and ceiling frame requirements for a given residential or commercial structure. For example,...	Construction Technology: 68107-09 Wall and Ceiling Framing
Wall and Ceiling Framing Systems	22	Work in teams to construct a wall frame and ceiling assembly by implementing required safety techniques, tools, and equipment. Accurately measure...	Construction Technology: 68107-09 Wall and Ceiling Framing
Wall and Ceiling Framing Systems	23	Compare and contrast the different tools, procedures, and fastening methods used in steel wall framing versus wood wall framing in building...	Construction Technology: 68107-09 Wall and Ceiling Framing
Electrical Systems	24	Describe how different levels of electrical shock affect the human body. Research current OSHA standards and other regulations specific to...	Construction Technology: 68112-09 Electrical Safety
Electrical Systems	25	Citing technical data, explain the interrelationships among sources of current, voltage, resistance, and power in electric circuits and the...	Optional Supplement- Electrical Level One: 26103-14 Introduction to Electrical Circuits
Construction Drawings & Specifications	26	Inspect and interpret a full set of construction drawings and specifications for a construction project including civil, architectural, structural,...	Optional Supplement- Project Management: 44105-08 Construction Documents
Business and Project Management	27	Describe strategies used to promote collaboration, trust, and clear communication among internal and	Optional Supplement- Core Curriculum: 00108-09 Basic Employability Skills



		external parties on a job site. Practice...	
Business and Project Management	28	Describe the components and purpose of a basic contract document for a residential project. Recognize the relationship and responsibilities of various...	Optional Supplement- Project Management: 44105-08 Construction Documents

While not directly aligned to one specific standard, the following additional module should be covered for students to complete the NCCER Construction Technology certification: 68103-09 Handling and Placing Concrete

Residential & Commercial Construction II

Section	Standard	NCCER Module
Roofing Systems	7 Define and describe the framing components of gable and hip roofs such as the ridgeboard, plates, and types of rafters. For example, create...	Construction Technology: 68108-09 Roof Framing
Roofing Systems	8 Read and interpret drawings to determine roof framing requirements, such as calculating the length of a rafter based on the desired pitch...	Construction Technology: 68108-09 Roof Framing
Roofing Systems	9 Work in teams to construct a roof frame assembly by implementing required safety techniques, tools, and equipment to accurately measure, lay out,...	Construction Technology: 68108-09 Roof Framing
Roofing Systems	10 Compare and contrast different procedures to frame a roof. For example, describe the benefits of using prefabricated trusses in place of framing...	Construction Technology: 68108-09 Roof Framing
Roofing Systems	11 Compare and contrast the materials, methods, and procedures for roofing with fiberglass shingles with other roofing materials such as wood...	Construction Technology: 68109-09 Roofing Applications
Roofing Systems	12 Apply the appropriate tools, equipment, and procedures to safely install shingles on a roof including strategies for watertight installation,...	Construction Technology: 68109-09 Roofing Applications
Exterior Finishing	13 Examine a wall section drawing for a specific building. Identify, define, and explain the function of each component including wall insulation,...	Construction Technology: 68110-09 Exterior Finishing



Exterior Finishing	14	Interpret wall section drawings to safely construct a cornice. For example, accurately measure materials, employ tools, and follow procedures...	Construction Technology: 68110-09 Exterior Finishing
Exterior Finishing	15	Analyze various finish systems used to sheath a building, including but not limited to wood siding, fiber-cement siding, vinyl siding, metal siding,...	Construction Technology: 68110-09 Exterior Finishing
Exterior Finishing	16	Estimate the siding materials needed to cover a building utilizing mathematical principles such as area formulas and quantitative reasoning. Utilize...	Construction Technology: 68110-09 Exterior Finishing
Basic Stair Framing	17	Analyze the components of a stair system. Read and interpret construction drawings to determine stair system requirements such as the...	Construction Technology: 68111-09 Basic Stair Layout
Basic Stair Framing	18	Apply the appropriate tools, equipment, and procedures to safely build a small stair unit, demonstrating proper procedures for laying out...	Construction Technology: 68111-09 Basic Stair Layout
Introduction to Masonry Systems	19	Describe the materials and methods used in modern masonry. Distinguish between masonry units made of clay products (i.e. brick) and masonry units...	Construction Technology: 68104-09 Introduction to Masonry
Introduction to Masonry Systems	20	Describe and demonstrate the procedures and techniques of basic bricklaying, including preparing mortar, laying a mortar bed, and laying...	Construction Technology: 68104-09 Introduction to Masonry
Plumbing Systems	21	Study a schematic plan of a typical community sewer system. Citing evidence from a technical description or actual observation of a system, explain...	Construction Technology: 68115-09 Introduction to Drain, Waste, and Vent (DWV) Systems
Plumbing Systems	22	Demonstrate understanding of the specific roles of various plumbing components in a drain, waste, and vent system by sketching a system model...	Construction Technology: 68115-09 Introduction to Drain, Waste, and Vent (DWV) Systems
Plumbing Systems	23	Analyze the function of a trap by examining a drain, waste, and vent system whose trap has lost its seal. Diagnose and explain the cause and determine...	Construction Technology: 68115-09 Introduction to Drain, Waste, and Vent (DWV) Systems
Plumbing Systems	24	Determine common requirements found in plumbing codes and explain why the codes are necessary; include the importance of proper plumbing...	Construction Technology: 68115-09 Introduction to Drain, Waste, and Vent (DWV) Systems



Plumbing Systems	25	Compare and contrast the material properties and uses of the various types of plastic and copper piping, including storing and handling, safety issues,...	Construction Technology: 68116-09 Plastic Pipe and Fittings 68117-09 Copper Pipe and Fittings
Plumbing Systems	26	Employ tools and procedures to safely measure, cut, ream, and join plastic and copper piping and fittings. For example, accurately measure PVC pipe,...	Construction Technology: 68116-09 Plastic Pipe and Fittings 68117-09 Copper Pipe and Fittings
Principles of Electrical Systems	27	Evaluate and recommend proper electrical hardware for a residential building. For example, for a residential dwelling with a given floor plan and schedule...	Construction Technology: 68113-09 Residential Electrical Services
Principles of Electrical Systems	28	Utilize the proper tools, equipment, and procedures to select and safely perform basic installation of device boxes according to drawings,...	Construction Technology: 68113-09 Residential Electrical Services Optional Supplement- Electrical Level One: 26106-14 Device Boxes
Principles of Electrical Systems	29	Utilizing test equipment such as a voltmeter, inspect and test an electrical wiring system for compliance according to drawings, specifications,...	Optional Supplement- Electrical Level One: 26112-14 Electrical Test Equipment
Introduction to Heating, Ventilation, and Air Conditioning Systems (HVAC)	30	Demonstrate understanding of the principles of heating, ventilation and air conditioning systems. Use graphic illustrations and supporting text...	Construction Technology: 68114-09 Introduction to HVAC
Introduction to Heating, Ventilation, and Air Conditioning Systems (HVAC)	31	Examine the regulations which impact the work of HVAC technicians, such as the Clean Air Act and EPA guidelines. Create a brochure to inform an...	Construction Technology: 68114-09 Introduction to HVAC
Construction Drawings & Specifications	32	Explain the relationship between construction drawings and specifications. For example, describe how both the construction drawings and...	Optional Supplement- Project Management: 44105-08 Construction Documents
Construction Drawings & Specifications	33	Describe processes by which construction professionals obtain clarification from architects regarding construction documents, such as by the...	Optional Supplement- Project Management: 44105-08 Construction Documents



While not directly aligned to one specific standard, the following additional module should be covered for students to complete the NCCER Construction Technology certification: 68105-09 Masonry Units and Installation Techniques

Structural Systems I

Section	Standard	NCCER Module
Safety	1 Identify safety hazards on a jobsite and demonstrate practices for safe working. Accurately read, interpret, and demonstrate adherence to safety ...	Carpentry Level One: 27101-13 Orientation to the Trade
Safety	2 Maintain safety records and demonstrate adherence to industry-standard practices regarding general machine safety, tool safety, equipment...	Carpentry Level One: 27101-13 Orientation to the Trade
Safety	3 Follow procedures to work safely around materials. Adhere to responsibilities for employees in material safety as outlined by the Hazard Communication...	Carpentry Level One: 27101-13 Orientation to the Trade 27102-13 Building Materials, Fasteners, and Adhesives
Career Exploration	4 Referencing data from U.S. Department of Labor and other sources, explain an apprenticeship. Write persuasively to describe the benefits of the apprenticeship...	Carpentry Level One: 27101-13 Orientation to the Trade
Career Exploration	5 Research apprenticeships and postsecondary institutions (colleges of applied technology, community colleges, and four-year universities) in Tennessee...	Carpentry Level One: 27101-13 Orientation to the Trade
Types of Structural Systems	8 Compare and contrast types of structural framing systems, including wood light-frame, structural steel, and reinforced concrete, analyzing...	Carpentry Level One: 27102-13 Building Materials, Fasteners, and Adhesives
Material and Methods of Light-Frame Wood Construction	9 Distinguish among the basic types of wood framing systems, such as platform frames, balloon frames, and post-and-beam frames. Create a chart...	Carpentry Level One: 27105-13 Floor Systems
Materials and Methods of Light-Frame Wood Construction	10 Analyze the characteristics and uses of various types of wood products used in light frame construction. a. Categorize types of wood as hardwood or softwood...	Carpentry Level One: 27102-13 Building Materials, Fasteners, and Adhesives
Tools & Equipment	11 Accurately identify hand and power tools used in carpentry, describing the safe use and maintenance of each. Hand tools include levels,...	Carpentry Level One: 27103-13 Hand and Power Tools



Construction Drawings & Specifications	12	Inspect and interpret a full set of construction drawings and specifications for a construction project including civil, architectural, structural,...	Carpentry Level One: 27104-13 Introduction to Construction Drawings, Specifications, and Layout
Floor Framing Systems	13	Implement geometric principles to square a building layout. For example, in the process of staking the corners of a building, check the layout...	Carpentry Level One: 27104-13 Introduction to Construction Drawings, Specifications, and Layout
Floor Framing Systems	14	Identify the components which make up a floor frame, analyzing the purpose of and interrelationships among each component ...	Carpentry Level One: 27105-13 Floor Systems
Floor Framing Systems	15	Read and interpret construction drawings to determine floor system requirements, such as the proper girder and joist size for a given span...	Carpentry Level One: 27105-13 Floor Systems
Floor Framing Systems	16	Describe the procedures necessary to fasten sills to the foundation and construct a floor assembly. Apply the appropriate tools, equipment,...	Carpentry Level One: 27105-13 Floor Systems
Wall and Ceiling Framing Systems	17	Explain the procedure to lay out a wood frame wall, defining and describing the components such as plates, studs, partitions, door and window...	Carpentry Level One: 27111-13 Wall Systems
Wall and Ceiling Framing Systems	18	Read and interpret drawings to determine wall and ceiling frame requirements for a given residential or commercial structure. For example,...	Carpentry Level One: 27111-13 Wall Systems
Wall and Ceiling Framing Systems	19	Work in teams to construct a wall frame and ceiling assembly by implementing required safety techniques, tools, and equipment. Accurately...	Carpentry Level One: 27111-13 Wall Systems
Roof Framing Systems	20	Define and describe the framing components of gable and hip roofs such as the ridge board, plates, and types of rafters. Create a graphic...	Carpentry Level One: 27112-13 Ceiling Joist and Roof Framing
Roof Framing Systems	21	Read and interpret drawings to determine roof framing requirements, such as calculating the length of a rafter based on the desired pitch...	Carpentry Level One: 27112-13 Ceiling Joist and Roof Framing
Roof Framing Systems	22	Work in teams to construct a roof frame assembly by implementing required safety techniques, tools, and equipment to accurately measure,...	Carpentry Level One: 27112-13 Ceiling Joist and Roof Framing



Roof Framing Systems	23	Compare and contrast different procedures to frame a roof. For example, describe the benefits of using prefabricated trusses in place of framing...	Carpentry Level One: 27112-13 Ceiling Joist and Roof Framing
Introduction to Building Envelope Systems	24	Analyze the components of a building envelope system, including building wrap, insulation, and various types of windows and exterior doors...	Carpentry Level One: 27109-13 Introduction to Building Envelope Systems
Introduction to Building Envelope Systems	25	Describe the procedures necessary to prepare a rough opening and install windows and doors. Apply the appropriate tools, equipment, and...	Carpentry Level One: 27109-13 Introduction to Building Envelope Systems
Basic Stair Framing Systems	26	Analyze the components of a stair system. Read and interpret construction drawings to determine stair system requirements such...	Carpentry Level One: 27110-13 Basic Stair Layout
Basic Stair Framing Systems	27	Apply the appropriate tools, equipment, and procedures to safely build a small stair unit, demonstrating proper procedures for laying...	Carpentry Level One: 27110-13 Basic Stair Layout
Business and Project Management	29	Describe the components and purpose of a basic contract document for a residential project. Recognize the relationship and responsibilities of...	Optional Supplement- Project Management: 44105-08 Construction Documents

Structural Systems II

In this course, the following standards correlate with teaching modules from the National Center for Construction Education and Research (NCCER). For more information, visit <http://www.nccer.org/>.

Section	Standard	NCCER Module
Construction Industry Principles	6 Consult a variety of sources to describe alternatives to traditional project delivery methods, such as the design-build and construction management-related...	Optional Supplement- Project Management: 44105-08 Construction Documents
Cold-Formed Steel Framing	9 Examine the components, fasteners, tools, and procedures used in cold-formed steel framing; compare and contrast cold-formed steel framing...	Carpentry Level Two: 27205-13 Cold-Formed Steel Framing
Cold-Formed Steel Framing	10 Demonstrate the ability to build steel frame components including back-to-back, box, and L-headers. Work in teams to lay out and install steel...	Carpentry Level Two: 27205-13 Cold-Formed Steel Framing



Exterior Finishing	11	Examine a wall section drawing for a specific building. Identify, define, and explain the function of each component including wall insulation, flashing,...	Carpentry Level Two: 27204-13 Exterior Finishing
Exterior Finishing	12	Interpret wall section drawings to safely construct a cornice. For example, accurately measure materials, employ tools, and follow procedures to...	Carpentry Level Two: 27204-13 Exterior Finishing
Exterior Finishing	13	Analyze various finish systems used to sheath a building, including but not limited to wood siding, fiber-cement siding, vinyl siding, metal siding,...	Carpentry Level Two: 27204-13 Exterior Finishing
Exterior Finishing	14	Estimate the siding materials needed to cover a building utilizing mathematical principles such as area formulas and quantitative reasoning. Utilize...	Carpentry Level Two: 27204-13 Exterior Finishing
Thermal & Moisture Protection	15	Explain the impact of heat transfer in a building, including heat loss during cold temperatures and heat gain during warm temperatures. Describe how...	Carpentry Level Two: 27203-13 Thermal and Moisture Protection
Thermal & Moisture Protection	16	Categorize the various types of insulation based on their characteristics and installation method. Summarize the key properties and installation procedures...	Carpentry Level Two: 27203-13 Thermal and Moisture Protection
Thermal & Moisture Protection	17	Describe the materials and methods used in a structure for moisture control, waterproofing, and ventilation. In a written narrative, explain how a vapor...	Carpentry Level Two: 27203-13 Thermal and Moisture Protection
Thermal & Moisture Protection	18	Interpret construction drawings and building codes to select and estimate the thermal and moisture protection materials needed to complete a...	Carpentry Level Two: 27203-13 Thermal and Moisture Protection
Roofing Applications	19	Compare and contrast the materials, methods, and procedures for roofing with fiberglass shingles with other roofing materials such as wood shingles,...	Carpentry Level Two: 27202-13 Roofing Applications
Roofing Applications	20	Apply the appropriate tools, equipment, and procedures to safely install shingles on a roof including strategies for watertight installation, using...	Carpentry Level Two: 27202-13 Roofing Applications
Windows, Doors, and Door Hardware	22	Analyze the parts of a door frame, including sills, jambs, and casings, and describe different interior door types. Read and interpret door schedules...	Carpentry Level Two: 27208-13 Doors & Door Hardware Optional Supplement- Carpentry Level Two: 27201-13 Commercial Drawings



Windows, Doors, and Door Hardware	23	Apply the appropriate tools, equipment, and procedures to safely install a door, including checking the plumb and square of a door frame...	Carpentry Level Two: 27208-13 Doors & Door Hardware
Drywall Installation & Finishing	24	Describe the various components involved in drywall installation, including the types of drywall, drywall fasteners and adhesives, and drywall accessories...	Carpentry Level Two: 27206-13 Drywall Installation
Drywall Installation & Finishing	25	Read and interpret drawings to select the type and thickness of drywall required for a specific installation. Utilize quantitative reasoning to estimate...	Carpentry Level Two: 27206-13 Drywall Installation
Drywall Installation & Finishing	26	Install gypsum drywall panels on stud walls and ceilings using different types of fastening systems, including nails, screws, and adhesives. Perform...	Carpentry Level Two: 27206-13 Drywall Installation
Drywall Finishing	27	Describe the procedures, tools, and materials used in drywall finishing, indicating the purpose of each material. Read and interpret industry standards...	Carpentry Level Two: 27207-13 Drywall Finishing
Drywall Finishing	28	Implement the proper procedures, tools, and materials to finish drywall. Procedures include preparing compounds, taping joints, applying joint...	Carpentry Level Two: 27207-13 Drywall Finishing
Drywall Finishing	29	Diagnose the cause and determine the appropriate solution for problems that occur in drywall finishing, citing evidence from textbooks or technical...	Carpentry Level Two: 27207-13 Drywall Finishing
Window, Door, Floor, and Ceiling Trim	30	Distinguish among the different types of standard trim, including base, wall, ceiling, window, and door trim. Utilize the proper tools, equipment,...	Carpentry Level Two: 27210-13 Window, Door, Floor, and Ceiling Trim
Window, Door, Floor, and Ceiling Trim	31	Apply the appropriate tools, fasteners, and procedures to install window, door, floor, and ceiling trim. Estimate the quantities of different trim materials...	Carpentry Level Two: 27210-13 Window, Door, Floor, and Ceiling Trim
Cabinet Installation	32	Identify the components which make up a basic set of cabinets, analyzing the purpose of and interrelationships among each component and explaining...	Carpentry Level Two: 27211-13 Cabinet Installation
Green Building	33	Research and identify green strategies used in the design and construction of buildings specifically impacting carpenters. Drawing on resources...	Optional Supplement- 70101-09 Your Role in the Green Environment
Construction Drawings & Specifications	34	Explain the relationship between construction drawings and specifications.	Carpentry Level Two: 27201-13 Commercial Drawings



		For example, describe how both the construction drawings and...	
Construction Drawings & Specifications	35	Describe processes by which construction professionals obtain clarification from architects regarding construction documents, such as by the use...	Optional Supplement- Project Management: 44105-08 Construction Documents

While not directly aligned to one specific standard, the following optional module may be covered for students as part of the NCCER Carpentry Level Two certification.

Mechanical, Electrical, & Plumbing Systems

In this course, the following standards correlate with teaching modules from the National Center for Construction Education and Research (NCCER). For more information, visit <http://www.nccer.org/>.

Section	Standard	NCCER Module
Safety	1 Identify safety hazards on a jobsite and demonstrate practices for safe working. Accurately read, interpret, and demonstrate adherence to safety rules,...	Plumbing Level One: 02102-12 Plumbing Safety
Safety	2 Continue to maintain safety records and demonstrate adherence to industry-standard practices regarding general machine safety, tool safety, equipment safety,...	Plumbing Level One: 02102-12 Plumbing Safety
Safety	3 Follow procedures to work safely around materials. Adhere to responsibilities for employees in material safety as outlined by the Hazard Communication...	Plumbing Level One: 02102-12 Plumbing Safety
Tools & Equipment	4 For each of the systems covered in this course, identify and select the proper tools and accessories, critique the readiness of the tools, use...	Plumbing Level One: 02103-12 Tools of the Plumbing Trade
Career Exploration	5 Compare and contrast career opportunities within the HVAC, electrical, and plumbing industries. Building on career exploration conducted in <i>Fundamentals</i> ...	Electrical Level One: 26101-14 Orientation to the Electrical Trade Plumbing Level One: 02101-12 Introduction to the Plumbing Profession HVAC Level One: 03101-13 Introduction to HVAC



Career Exploration	6	Explain what an apprenticeship is, referencing data from the U.S. Department of Labor and other sources. Write persuasively to describe the benefits...	Electrical Level One: 26101-14 Orientation to the Electrical Trade HVAC Level One: 03101-13 Introduction to HVAC
Construction Math	10	Apply mathematics concepts to solve HVAC, electrical, and plumbing problems, distinguishing which principles apply to a given problem. Concepts...	Plumbing Level One: 02104-12 Introduction to Plumbing Math HVAC Level One: 03102-13 Trade Math
Electrical Systems	11	Describe how different levels of electrical shock affect the human body. Research current OSHA standards and other regulations specific to job-site electrical safety to identify methods...	Electrical Level One: 26102-14 Electrical Safety
Electrical Systems	12	Examine basic electrical circuits and components. Explain the difference between conductors and insulators. Demonstrate understanding of the layout and operation of electrical circuits (series, parallel, and series-parallel circuits). Define voltage...	Electrical Level One: 26103-14 Introduction to Electrical Circuits
Electrical Systems	13	Apply Ohm's law and Kirchhoff's laws to solving given problems in electrical circuits. Defend the solution using supporting evidence that explains the cause and effect relationship between the laws and each of the following:	Electrical Level One: 26104-14 Electrical Theory
Electrical Systems	14	Building on knowledge of basic electrical circuits, examine a residential wiring system and explain the layout and the basic function of each component in the circuit (i.e. service entrance...	Electrical Level One: 26103-14 Introduction to Electrical Circuits
Electrical Systems	15	Analyze the composition and properties of conductors. Explain how the markings on a conductor relate to the physical properties of the conductor,...	Portion of- Electrical Level One: 26109-14 Conductors and Cables
Electrical Systems	16	Determine the procedures necessary to safely replace or install electrical devices in a device box, such as a light fixture, receptacle, or switch. Draw...	Apply prior modules.
Plumbing Systems	17	Examine safety considerations specific to plumbers by identifying possible hazards on a job site. In a written or oral presentation, explain how to work...	Plumbing Level One: 02102-12 Plumbing Safety



Plumbing Systems	18	Describe the movement of potable water and waste within the plumbing systems of a building, drawing distinctions between water supply systems and drain,...	Plumbing Level One: 02111-12 Introduction to Drain, Waste, and Vent (DWV) Systems
Plumbing Systems	19	Determine common requirements found in plumbing codes and explain why the codes are necessary; include the importance of proper plumbing...	Plumbing Level One: 02111-12 Introduction to Drain, Waste, and Vent (DWV) Systems
Piping	20	Analyze the parts of a pipe fitting including the face, center, and back. Determine fitting allowances by using measuring and calculating techniques...	Plumbing Level One: 02104-12 Introduction to Plumbing Math
Piping	21	Compare and contrast the material properties and uses of the various types of plastic piping, including storing and handling, safety issues, and types...	Plumbing Level One: 02106-12 Plastic Pipe and Fittings
Piping	22	Employ tools and procedures to safely measure, cut, ream, and join plastic piping and fittings. For example, accurately measure PVC pipe, use a...	Plumbing Level One: 02106-12 Plastic Pipe and Fittings
Heating, Ventilation, and Air Conditioning Systems (HVAC)	23	Examine safety considerations specific to HVAC technicians by identifying possible hazards on a job site. Analyze the regulations that impact the work...	HVAC Level One: 03101-13 Introduction to HVAC
Heating, Ventilation, and Air Conditioning Systems (HVAC)	24	Describe the basic components included in an HVAC system, outlining the purposes of each, citing textual resources such as blueprints, manuals,...	HVAC Level One: 03101-13 Introduction to HVAC
Heating, Ventilation, and Air Conditioning Systems (HVAC)	25	Explain the fundamental concepts of heating and combustion, including describing the processes by which heat is transferred. Illustrate the...	HVAC Level One: 03108-13 Introduction to Heating
Heating, Ventilation, and Air Conditioning Systems (HVAC)	26	Relate the types of heat transfer to the various heating systems used within a building. Examine the schematic layout of a heating system within a building,...	HVAC Level One: 03108-13 Introduction to Heating



Construction Drawings & Specifications	27	Inspect and interpret a full set of construction drawings and specifications for a construction project including civil, architectural, structural...	Optional Supplement- Project Management: 44105-08 Construction Documents
Business and Project Management	28	Describe strategies used to promote collaboration, trust, and clear communication among internal and external parties on a job site...	Core Curriculum: 00108-09 Basic Employability Skills

Electrical Systems

In this course, the following standards correlate with teaching modules from the National Center for Construction Education and Research (NCCER). For more information, visit <http://www.nccer.org/>.

Section	Standard	NCCER Module
Safety	1 Identify safety hazards on a jobsite and demonstrate practices for safe working. Accurately read, interpret, and demonstrate safety rules, including but not limited to rules pertaining to electrical safety, Occupational Safety and Health Administration (OSHA) guidelines,...	Electrical Level One: 26102-14 Electrical Safety
Safety	2 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...	Electrical Level One: 26102-14 Electrical Safety
Safety	3 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 (MSDS). For example, obtain...	Electrical Level One: 26102-14 Electrical Safety
Safety	4 Describe hazards involved when working with electricity and determine procedures to safeguard against them in the workplace, including ensuring power load balance, adhering to the appropriate use of ground-fault circuit interrupters (GFCIs)...	Electrical Level One: 26102-14 Electrical Safety



Tools & Equipment	6	Distinguish among the various types and uses of electrical test equipment. Determine the appropriate test equipment for a given situation and environment and the procedures necessary for safe use. Utilizing test equipment such as a voltmeter,...	Electrical Level One: 26112-14 Electrical Test Equipment
Construction Industry Principles	7	Locate and assess requirements for performing electrical work including local, state, and national requirements. Interpret electrical codes, and determine inspection procedures and other applicable portions of the law. Visit the Tennessee...	Electrical Level One: 26105-14 Introduction to the National Electrical Code
Construction Industry Principles	8	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...	Optional Supplement- Project Management: 44105-08 Construction Documents
National Electrical Code (NEC®)	9	Describe the purpose and layout of the National Electrical Code (NEC®). Create a chart to illustrate what is and is not covered by the NEC®, citing evidence from <i>NEC® Article 90</i> . Navigate, read, and interpret the NEC® to determine requirements...	Electrical Level One: 26105-14 Introduction to the National Electrical Code
Device Boxes	10	Distinguish among the various types of device boxes, such as metallic and nonmetallic device boxes. For a variety of given residential and/or commercial applications, select appropriate device boxes according to drawings, specifications,...	Electrical Level One: 26106-14 Device Boxes
Device Boxes	11	Utilize the proper tools, equipment, and procedures to safely perform installation of a variety of device boxes according to drawings, specifications, and code requirements...	Electrical Level One: 26106-14 Device Boxes
Hand Bending	12	Describe the procedures, techniques, and tools for hand bending and installing conduit. Implement geometric principles to plan and use a hand bender to make 90 degree bends, back-to-back bends, offsets, kicks, and saddle bends...	Electrical Level One: 26107-14 Hand Bending
Hand Bending	13	Apply the appropriate tools, equipment, and procedures to safely cut, ream, and thread conduit. For example, ream the inside edge of a piece of conduit using a hand reamer...	Electrical Level One: 26107-14 Hand Bending



Raceway Systems	14	Explain the function of raceway systems, including acting as a grounding conductor. Distinguish among the various types of raceways, fittings, and conduit bodies available for raceway systems. Analyze a given environment and select the appropriate...	Electrical Level One: 26108-14 Raceways and Fittings
Raceway Systems	15	Outline the methods and procedures used to install various raceway systems, including terminating conduit. Accurately connect conduit to a box according to code requirements, explaining the need for a proper connection based...	Electrical Level One: 26108-14 Raceways and Fittings
Conductors & Cables	16	Building on knowledge of conductors from <i>Mechanical, Electrical, & Plumbing Systems</i> , read and interpret the NEC [®] and other instructional texts to determine the allowable ampacity of conductors for a variety of given applications. Include...	Electrical Level One: 26109-14 Conductors and Cables
Conductors & Cables	17	Describe the proper methods and procedures for installing conductors in a raceway system, noting potential hazards that exist when conductors are installed incorrectly. Employ tools and procedures to safely install conductors in a raceway...	Electrical Level One: 26109-14 Conductors and Cables
Construction Drawings & Specifications	18	Building on knowledge of construction drawings and specifications from <i>Mechanical, Electrical, & Plumbing Systems</i> , read and interpret electrical drawings and specifications, including detail drawings and equipment schedules, to create a list of materials...	Electrical Level One: 26110-14 Basic Electrical Construction Drawings
Construction Drawings & Specifications	19	Explain the relationship between construction drawings and specifications. For example, describe how both the construction drawings and specifications provide information about the raceway system indicated for a given building. Examine...	Electrical Level One: 26110-14 Basic Electrical Construction Drawings
Construction Drawings & Specifications	20	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...	Optional Supplement- Project Management: 44105-08 Construction Documents



Residential Electrical Services	21	Evaluate and recommend proper electrical hardware for a residential building. For example, for a residential dwelling with a given floor plan and schedule of major appliances, determine the size of the electrical service by referring to the National...	Electrical Level One: 26111-14 Residential Electrical Services
Alternate Power Systems	24	Analyze typical electric power systems in a region by explaining how electricity is generated, transmitted, and distributed from a power plant to a given location. Describe different types of traditional power generation including fossil-fuel...	Optional Supplement- Power Generation Maintenance Electrician 49101-10 Introduction to the Power Industry
Business and Project Management	25	Analyze typical electric power systems in a region by explaining how electricity is generated, transmitted, and distributed from a power plant to a given location. Describe different types of traditional power generation including fossil-fuel...	Optional Supplement- Power Generation Maintenance Electrician 49101-10 Introduction to the Power Industry
Business and Project Management	26	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...	Optional Supplement- Project Management: 44105-08 Construction Documents

HVAC

In this course, the following standards correlate with teaching modules from the National Center for Construction Education and Research (NCCER). For more information, visit <http://www.nccer.org/>.

Section	Standard	NCCER Module
Construction Industry Principles	6 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...	Optional Supplement- Project Management: 44105-08 Construction Documents
HVAC and Electricity	7 Building on knowledge of electricity from <i>Mechanical, Electrical, and Plumbing Systems</i> , describe the functions of electrical components used in HVAC systems. Examine an electrical diagram of an HVAC system and interpret symbols to describe...	HVAC Level One: 03106-13 Basic Electricity



Heating Systems	8	Building on knowledge of heat transfer from <i>Mechanical, Electrical, & Plumbing Systems</i> , 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...	HVAC Level One: 03108-13 Introduction to Heating
Heating Systems	9	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...	HVAC Level One: 03108-13 Introduction to Heating
Heating Systems	10	Compare and contrast gas furnaces, hydronic heating systems, and electric heating 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...	HVAC Level One: 03108-13 Introduction to Heating
Cooling Systems	11	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...	HVAC Level One: 03107-13 Introduction to Cooling
Cooling Systems	12	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,...	HVAC Level One: 03107-13 Introduction to Cooling
Refrigerant Management	13	Building on knowledge from <i>Mechanical, Electrical, & Plumbing Systems</i> , 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...	HVAC Level Two: 03301-13 Refrigerants and Oils
Refrigerant Management	14	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...	HVAC Level Two: 03205-13 Leak Detection, Evacuation, Recovery, and Charging



Refrigerant Management	15	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,...	HVAC Level Two: 03205-13 Leak Detection, Evacuation, Recovery, and Charging
Refrigerant Management	16	Evaluate the purpose and procedures of system 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...	HVAC Level Two: 03205-13 Leak Detection, Evacuation, Recovery, and Charging
Refrigerant Management	17	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...	HVAC Level Two: 03205-13 Leak Detection, Evacuation, Recovery, and Charging
Air Distribution Systems	18	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...	HVAC Level One: 03109-13 Air Distribution Systems
Air Distribution Systems	19	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...	HVAC Level One: 03109-13 Air Distribution Systems
Air Distribution Systems	20	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...	HVAC Level One: 03109-13 Air Distribution Systems
Air Distribution Systems	21	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...	HVAC Level One: 03109-13 Air Distribution Systems



Basic Copper & Plastic Piping	22	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...	HVAC Level One: 03103-13 Basic Copper and Plastic Piping Practices
Basic Copper & Plastic Piping	23	Describe the properties of various types of copper tubing used for HVAC. Describe common fittings, hangers, and supports used in copper tubing. Demonstrate how to measure, cut, and bend copper tubing for HVAC systems while preparing...	HVAC Level One: 03103-13 Basic Copper and Plastic Piping Practices
Soldering & Brazing	24	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...	HVAC Level One: 03104-13 Soldering and Brazing
Soldering & Brazing	25	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...	HVAC Level One: 03104-13 Soldering and Brazing
Soldering & Brazing	26	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...	HVAC Level One: 03104-13 Soldering and Brazing
Carbon Steel Piping	27	Describe the characteristics and uses of steel pipe, making note of the similarities and differences in steel piping, plastic piping, and copper tubing. Draw on evidence from textbooks and physical observations to support claims...	HVAC Level One: 03105-13 Basic Carbon Steel Piping Practices
Carbon Steel Piping	28	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...	HVAC Level One: 03105-13 Basic Carbon Steel Piping Practices
Carbon Steel Piping	29	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...	HVAC Level One: 03105-13 Basic Carbon Steel Piping Practices



Basic Maintenance & Repair Process	31	Identify routine maintenance procedures that should be performed on HVAC systems for a given building. Create a timeline of recommended maintenance procedures for a client, justifying why each procedure is necessary by highlighting its...	HVAC Level Two: 03215-13 Basic Maintenance
Construction Drawings & Specifications	32	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...	Optional Supplement- Project Management: 44105-08 Construction Documents
Construction Drawings & Specifications	33	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...	Optional Supplement- Project Management: 44105-08 Construction Documents
Business & Project Management	34	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...	Optional Supplement- Project Management: 44105-08 Construction Documents
Business & Project Management	37	Produce clear and coherent writing for communication in the HVAC industry. Create a service order for a given HVAC project. Explain the service order to a peer, as would a service technician to a client...	HVAC Level Two: 03215-13 Basic Maintenance

Plumbing Systems

In this course, the following standards correlate with teaching modules from the National Center for Construction Education and Research (NCCER). For more information, visit <http://www.nccer.org/>.

Section	Standard	NCCER Module
Safety	1 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...	Reinforce- Plumbing Level One: 02102-12 Plumbing Safety



Safety	2	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,...	Reinforce- Plumbing Level One: 02102-12 Plumbing Safety
Safety	3	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...	Reinforce- Plumbing Level One: 02102-12 Plumbing Safety
Tools & Equipment	4	Identify and select the proper tools and accessories, critique the readiness of the tools, use the tools to accomplish the desired tasks, and then return the tools and accessories to their proper storage. Research a new technology recently...	Reinforce- Plumbing Level One: 02103-12 Tools of the Plumbing Trade
Construction Industry Principles	6	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...	Optional Supplement- Project Management: 44105-08 Construction Documents
Construction Drawings & Specifications	7	Building on knowledge of construction drawings and specifications from <i>Mechanical, Electrical, & Plumbing Systems</i> , examine plumbing drawings and identify common plumbing symbols used for the components of pipe assemblies. Read and interpret...	Plumbing Level One: 02105-12 Introduction to Plumbing Drawings
Construction Drawings & Specifications	8	Explain the relationship between construction drawings and specifications. Describe how both the construction drawings and specifications provide information about the plumbing system for a building. For example, examine construction drawings...	Plumbing Level One: 02105-12 Introduction to Plumbing Drawings Optional Supplement- Project Management: 44105-08 Construction Documents
Construction Drawings & Specifications	9	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...	Plumbing Level One: 02105-12 Introduction to Plumbing Drawings Optional Supplement- Project Management: 44105-08 Construction Documents



Construction Drawings & Specifications	10	Demonstrate the ability to use an architect's scale to measure a component of a scale drawing. Create drawings commonly used in the plumbing trade, including orthographic and isometric sketches...	Plumbing Level One: 02105-12 Introduction to Plumbing Drawings
Plumbing Math	11	Apply mathematics concepts to solve plumbing problems, distinguishing which principles apply to a given problem. Concepts should include, but are not limited to: a. Using the basic rules of right triangles,...	Reinforce- Plumbing Level One: 02104-12 Introduction to Plumbing Math
Plastic Pipe & Fittings	12	Building on the knowledge of plastic piping from <i>Mechanical, Electrical, and Plumbing Systems</i> , distinguish among different types of plastic plumbing pipe, fittings, valves, hanging, and support. Draw on textual evidence and observations...	Plumbing Level One: 02106-12 Plastic Pipe and Fittings
Plastic Pipe & Fittings	13	Read and interpret manufacturer's instructions, construction drawings and specifications, and applicable codes to properly install plastic pipe, including measuring, cutting, joining, and supporting plastic pipe. Utilize the appropriate tools,...	Plumbing Level One: 02106-12 Plastic Pipe and Fittings
Copper Tube & Fittings	14	Distinguish among different types of copper tube, fittings, valves, hanging, and support. Draw on textual evidence and observations to describe the material properties of copper tube and create guidelines for proper storage and handling requirements...	Plumbing Level One: 02107-12 Copper Tube and Fittings
Copper Tube & Fittings	15	Read and interpret manufacturer's instructions, construction drawings and specifications, and applicable codes to properly install copper tubing, including measuring, cutting, bending, joining, grooving, and supporting plastic pipe....	Plumbing Level One: 02107-12 Copper Tube and Fittings
Cast-Iron Pipe & Fittings	16	Distinguish among different types of cast-iron pipe, fittings, valves, hanging, and support. Draw on textual evidence and observations to describe the material properties of cast-iron pipe and create guidelines for proper storage and handling...	Plumbing Level One: 02108-12 Cast-Iron Pipe and Fittings
Cast-Iron Pipe & Fittings	17	Demonstrate proper procedures to correctly measure, cut, and join cast-iron pipe utilizing the appropriate tools, equipment, and PPE. Describe testing...	Plumbing Level One: 02108-12 Cast-Iron Pipe and Fittings



Carbon Steel Pipe & Fittings	18	Distinguish among different types of steel pipe, fittings, valves, hanging, and support. Draw on textual evidence and observations to describe the material properties of steel pipe and create guidelines for proper storage and handling...	Plumbing Level One: 02109-12 Carbon Steel Pipe and Fittings
Carbon Steel Pipe & Fittings	19	Read and interpret manufacturer's instructions, construction drawings and specifications, and applicable codes to properly install steel pipe, including measuring, cutting, joining, and supporting steel pipe. Utilize the appropriate tools,...	Plumbing Level One: 02109-12 Carbon Steel Pipe and Fittings
Plumbing Fixtures	20	Describe the features and operating principles of various types of plumbing fixtures, including sinks, lavatories, faucets, bathtubs, showers, and water closets. Analyze the operational procedures of two different water closets,...	Plumbing Level One: 02110-12 Introduction to Plumbing Fixtures
Drain, Waste, & Vent (DWV) Systems	21	Study a schematic plan of a typical community sewer system. Citing evidence from a technical description or actual observation of a system, explain how waste moves through a drain, waste, and vent system from the fixture to the environment...	Plumbing Level One: 02111-12 Introduction to Drain, Waste, and Vent (DWV) Systems
Drain, Waste, & Vent (DWV) Systems	22	Demonstrate understanding of the specific roles of various plumbing components in a drain, waste, and vent system by sketching a system model. Label the components, and include a written description of the function of each. Be able...	Plumbing Level One: 02111-12 Introduction to Drain, Waste, and Vent (DWV) Systems
Drain, Waste, & Vent (DWV) Systems	23	Analyze the function of a trap by examining a drain, waste, and vent system whose trap has lost its seal. Diagnose and explain the cause and determine the appropriate solution, citing evidence from textbooks or technical manuals in order...	Plumbing Level One: 02111-12 Introduction to Drain, Waste, and Vent (DWV) Systems
Water Distribution Systems	24	Study a schematic plan of a typical municipal water distribution system. Citing evidence from a technical description or actual observation of a system, explain how water travels from a water treatment plant to a fixture in a residence. Create a graphic...	Plumbing Level One: 02112-12 Introduction to Water Distribution Systems



Business and Project Management	28	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...	Optional Supplement- Project Management: 44105-08 Construction Documents
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