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Training for Careers in Construction

Course Catalog



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Technical Development Courses



National Center for
Construction Education
and Research



Home Builder's
Institute



CPR / AED / Basic
First Aid



Occupational Safety and
Health Administration
for Construction



Build Smart
Institute
Certificate



Course may be
taken virtually
or in person

COR101 - Core Fundamentals of Construction



90 hours

Prerequisite (s): None

Designed to provide entry level students an overview of a variety of construction careers by learning basic construction knowledge and skills.

- Construction Safety
- Construction Math
- Introduction to Construction Hand and Power Tools
- Materials Handling
- Introduction to Construction Drawings
- Employability Skills such as critical thinking skills, problem solving and effective self-presentation

CAR101 - Carpentry 1



162.5 hours

Prerequisite (s): COR101

Designed for students who have completed the Core Fundamentals of Construction Course (COR101) and are pursuing Carpentry as a skilled trade.

- Orientation to the Trade
- Building Materials, Fasteners and Adhesives
- Hand and Power Tools review
- Intermediate Construction Drawings
- Specifications
- Layout
- Floor Systems
- Wall Systems
- Ceiling Joist
- Roof Framing
- Introduction to Building Envelope Systems
- Basic Stair Layout

CAR201 - Carpentry 2



210 hours

Prerequisite (s): COR101 | CAR101

Designed for students who have completed the Core Fundamentals of Construction Course (COR101) and Carpentry 1 (CAR101) and are pursuing Carpentry as a skilled trade.

- Commercial Drawings
- Cold-Formed Steel Framing
- Exterior Finishing
- Thermal and Moisture Protection
- Roofing Applications
- Doors and Door Hardware
- Drywall Installation
- Drywall Finishing
- Suspended Ceilings
- Window, Door, Floor, and Ceiling Trim
- Cabinet Installation



Technical Development Courses

CAR301 - Carpentry 3

NCCER

160 hours

Prerequisite (s): COR101 | CAR101 | CAR 201

Designed for students who have completed the Core Fundamentals of Construction Course (COR101), Carpentry 1 (CAR101), and Carpentry 2 (CAR201) and are pursuing Carpentry as a skilled trade.

- Properties of Concrete
- Rigging Equipment
- Rigging Practices
- Trenching and Excavating
- Reinforcing Concrete
- Foundations and Slab-on-Grade
- Vertical Formwork
- Horizontal Formwork
- Handling and Placing Concrete
- Tilt-Up Wall Systems

CAR401 - Carpentry 4

NCCER

162.5 hours

Prerequisite (s): COR101 | CAR101 | CAR 201 | CAR301

Designed for students who have completed the Core Fundamentals of Construction Course (COR101), Carpentry 1 (CAR101), Carpentry 2 (CAR201), and Carpentry 3 (301) and are pursuing Carpentry as a skilled trade.

- Site Layout One: Differential Leveling
- Site Layout Two: Angular and Distance Measurement
- Advanced Roof Systems
- Advanced Wall Systems
- Advanced Stair Systems
- Introduction to Construction Equipment
- Site Preparation
- Fundamentals of Crew Leadership

ELE101 - Electrical 1

NCCER

112.5 hours

Prerequisite (s): COR101

Designed for students who have completed the Core Fundamentals of Construction Course (COR101) and are pursuing Electrical as a skilled trade.

- Orientation to the Electrical Trade
- Electrical Safety
- Introduction to Electrical Circuits
- Electrical Theory
- Introduction to the National Electrical Code
- Device Boxes
- Hand Bending
- Raceways and Fittings
- Conductors and Cables
- Basic Electrical Construction Drawings
- Residential Electrical Services
- Electrical Test Equipment



Technical Development Courses

ELE201 - Electrical 2

NCCER

145 hours

Prerequisite (s): COR101 | ELE101

Designed for students who have completed the Core Fundamentals of Construction Course (COR101) and Electrical 1 (ELE101) and are pursuing Electrical as a skilled trade.

- Alternating Current
- Motors: Theory and Application
- Electrical Lighting
- Conduit Bending
- Pull and Junction Boxes
- Conductor Installations
- Cable Tray
- Conductor Terminations and Splices
- Grounding and Bonding
- Circuit Breakers and Fuses
- Control Systems
- Fundamental Concepts

ELE301 - Electrical 3

NCCER

155 hours

Prerequisite (s): COR101 | ELE101 | ELE201

Designed for students who have completed the Core Fundamentals of Construction Course (COR101), Electrical 1 (ELE101), and Electrical 2 (ELE201) and are pursuing Electrical as a skilled trade.

- Load Calculations
- Conductor Selection
- Practical Applications of Lighting
- Hazardous Locations
- Overcurrent Protection
- Distribution Equipment and Transformers
- Commercial Electrical Services
- Motor Calculations
- Voice, Data, and Video
- Motor Controls

ELE401 - Electrical 4

NCCER

182.5 hours

Prerequisite (s): COR101 | ELE101 | ELE201 | ELE301

Designed for students who have completed the Core Fundamentals of Construction Course (COR101), Electrical 1 (ELE101), Electrical 2 (ELE201), and Electrical 3 (ELE301) and are pursuing Electrical as a skilled trade.

- Load Calculations – Feeders and Services
- Health Care Facilities
- Standby and Emergency Systems
- Basic Electronic Theory
- Fire Alarm Systems and Specialty Transformers
- Heat Tracing and Freeze Protection
- Motor Operation and Maintenance
- Medium Voltage
- Terminations/Splices and Special Locations
- Fundamentals of Crew Leadership



Technical Development Courses

HVA101 - Heating & Cooling 1

NCCER

144 hours

Prerequisite (s): COR101

Designed for students who have completed the Core Fundamentals of Construction Course (COR101) and are pursuing Heating and Cooling as a skilled trade.

- Introduction to HVAC
- Trade Mathematics
- Basic Electricity
- Introduction Heating
- Introduction Cooling
- Introduction to Air Distribution Systems
- Basic Copper and Plastic Pipe Practices
- Soldering, Brazing, and Basic Carbon Steel Piping
- Trade Mathematics
- Basic Electricity
- Introduction Heating and Cooling
- Introduction to Air Distribution Systems
- Soldering and Brazing and Basic Carbon Steel Piping Practices.

HVA201 - Heating & Cooling 2

NCCER

144 hours

Prerequisite (s): COR101 | HVA101

Designed for students who have completed the Core Fundamentals of Construction Course (COR101) and Heating and Cooling 1 (HVA101) and are pursuing Heating and Cooling as a skilled trade.

- Alternating Current
- Compressors
- Refrigerants and Oils
- Leak Detection
- Evacuation, Recovery, and Charging
- Metering Devices, Heat Pumps, and Basic Maintenance
- Chimneys, Vents, and Flues
- Sheet Metal Duct Systems
- Fiberglass and Flexible Duct Systems
- Commercial Airside Systems
- Air Quality Equipment
- Introduction to Hydronic Systems

HVA301 - Heating & Cooling 3

NCCER

144 hours

Prerequisite (s): COR101 | HVA101 | HVA201

Designed for students who have completed the Core Fundamentals of Construction Course (COR101), Heating and Cooling 1 (HVA101), and Heating and Cooling 2 (HVA201) and are pursuing Heating and Cooling as a skilled trade.

- Fasteners, Hard-ware, and Wiring Termination
- Control Circuit and Motor Troubleshooting
- Troubleshooting Cooling and Heat Pumps, Gas and Oil Heating
- Troubleshooting Accessories, Zoning, Ductless, and Variable Refrigerant Flow Systems
- Hydronic, Steam, Retail, and Refrigeration Systems
- Customer Relations



Technical Development Courses

HVA401 - Heating & Cooling 4

NCCER

144 hours

Prerequisite (s): COR101 | HVA101 | HVA201 | HVA301

Designed for students who have completed the Core Fundamentals of Construction Course (COR101), Heating and Cooling 1 (HVA101), Heating and Cooling 2 (HVA201), and Heating and Cooling 3 (HVA301) and are pursuing Heating and Cooling as a skilled trade.

- Water Treatment
- Indoor Air Quality
- Energy Conservation Equipment
- Building Management Systems
- System Air Balance
- System Startup and Shutdown
- Construction Drawings
- Heating and Cooling System Design
- Commercial/Industrial Refrigeration Systems
- Alternative and Specialized Heating and Cooling Systems
- Fundamentals of Crew Leadership

PLU101 - Plumbing 1

NCCER

144 hours

Prerequisite (s): COR101

Designed for students who have completed the Core Fundamentals of Construction Course (COR101) and are pursuing Plumbing as a skilled trade.

- Introduction to the Plumbing Profession
- Plumbing Safety
- Plumbing Tools
- Introduction to Plumbing Math
- Introduction to Plumbing Drawings
- Plastic Pipe and Fittings
- Copper Pipe and Fittings
- Cast-Iron Pipe and Fittings
- Carbon Steel Pipe and Fittings
- Corrugated Stainless Steel Tubing
- Fixtures and Faucets
- Introduction to Drain
- Waste and Vent Systems
- Introduction to Water Distribution Systems

PLU201 - Plumbing 2

NCCER

144 hours

Prerequisite (s): COR101 | PLU101

Designed for students who have completed the Core Fundamentals of Construction Course (COR101), and Plumbing 1 (PLU101) and are pursuing Plumbing as a skilled trade.

- Plumbing Math
- Reading Commercial Drawings
- Hangers, Supports, Structural Penetrations, and Fire Stopping
- Installing and Testing DWV Piping
- Installing Roof, Floor, and Area Drains
- Types of Valves
- Installing and Testing Water Supply Piping
- Installing Fixtures, Valves, and Faucets
- Basic Electricity
- Installing Water Heaters
- Fuel Gas Systems
- Servicing of Fixtures, Valves, and Faucets



Technical Development Courses

PLU301 - Plumbing 3

NCCER

144 hours

Prerequisite (s): COR101 | PLU101 | PLU201

Designed for students who have completed the Core Fundamentals of Construction Course (COR101), Plumbing 1 (PLU101), and Plumbing 2 (PLU201) and are pursuing Plumbing as a skilled trade.

- Applied Math
- Codes
- Types of Venting
- Indirect and Special Waste
- Sewage Pumps and Sump Pumps
- Sizing Water Supply Piping
- Backflow Preventer
- Water Pressure Boosters
- Recirculating Systems
- Servicing Piping Systems, Fixtures, and Appliances

PLU401 - Plumbing 4

NCCER

144 hours

Prerequisite (s): COR101 | PLU101 | PLU201 | PLU301

Designed for students who have completed the Core Fundamentals of Construction Course (COR101), Plumbing 1 (PLU101), Plumbing 2 (PLU201), and Plumbing 3 (PLU301) and are pursuing Plumbing as a skilled trade.

- Business Math for Plumbers,
- Sizing DWV and Storm Systems
- Private Water Supply Systems
- Private Waste Disposal Systems
- Locating Buried Water and Sewer Lines
- Hydronic and Solar Heating Systems
- Water Supply Treatment
- Swimming Pools and Hot Tubs
- Compressed Air
- Corrosive-Resistant Waste Piping
- Plumbing for Mobile Homes and Mobile Home Parks

ELE500 - Journeyman and Master Electrician Licensing Exam Preparation Course



8 hours

This course is designed to assist the student as to how to prepare for the Master or Journeyman State of Virginia Electrical Licensing Exam.

- What hours and experience are required in order to sit for the exam
- Applying to take the Exam
- Pre-Exam Preparation approaches
- What to study
- How to study for the exam
- What definitions to become familiar with
- What is allowed and not allowed
- Helpful hints
- Exam Question Sampling

MTT101 - Train the Trainer



8 hours

This course is designed to provide the seasoned professional the tools needed to train those new to their profession.

- Various roles a Mentor must assume for their trainee
- Different ways communication can happen
- How to improve communication
- Differing learning styles of individuals
- Problem solving techniques
- How to use this information to properly organize the instructional process

CMC101 - Construction Management



24 hours

This class is an overview of FCL101, PRS101, and PRM101 and is designed with (3) personnel types in mind. 1) those new to the management role 2) those newly promoted to higher level of management 3) those individuals that work in smaller companies where they must exercise the duties of multiple levels of management.

- Cursory Coverage of Supervision
- Project Management
- Safety
- Human Resource
- Problem Solving
- Construction Documents
- Construction Planning and Scheduling
- Cost Control
- Resource Control
- Quality Control
- Quality Assurance

FCL101 - Fundamentals of Crew Leadership

NCCER

22.5 hours

Fundamentals of Crew Leadership is designed to assist the recently or about to be promoted crew leader; it is beneficial for anyone in management. Includes performance tasks to assist the learning process.

- Basic leadership skills
- Different leadership styles
- Communication
- Delegating
- Problem solving
- Jobsite safety
- Crew leader role
- Project planning /scheduling
- Estimating



Professional Development Courses

ACL101 - Accelerated Fundamentals of Crew Leadership



8 hours

This expedited course is designed for busy professionals combining class instruction with independent study completed at your leisure. It is designed to assist the recently or about to be promoted crew leader; it is beneficial for anyone in management. Includes performance tasks to assist the learning process.

- Basic leadership skills
- Different leadership styles
- Communication
- Delegating
- Problem solving
- Jobsite safety
- Crew leader role
- Project planning /scheduling
- Estimating

PRS101 - Project Supervision (Site Superintendent)



85 hours

This Course is designed to introduce the skills or enhance the skills of a Project Supervisor or Superintendent; it is beneficial for anyone in site management.

- Orientation to the Supervision Role
- Human relations
- problem solving
- Safety
- Quality Control
- Contract
- Construction Documents
- Document control and estimating
- Planning and Scheduling
- Resource Control and Awareness.

APS101 - Accelerated Project Supervision (Site Superintendent)



16 hours

This expedited course is designed for busy professionals combining class instruction with independent study completed at your leisure. It will introduce the skills or enhance the skills of a Project Supervisor or Superintendent; it is beneficial for anyone in site management. Includes performance tasks to assist the learning process.

- Orientation to the Supervision Role
- Human relations
- problem solving
- Safety
- Quality Control
- Contract
- Construction Documents
- Document control and estimating
- Planning and Scheduling
- Resource Control and Awareness.



Professional Development Courses



MDC101 - Management Development Course

24 hours

This course is designed for aspiring leaders across all industries providing enhanced management skills.

- Problem Solving
- Planning and Scheduling
- Cost Control
- Resource Control
- Quality Control
- Quality Assurance
- Safety
- Human Resource
- Continued Improvement

PRM101 - Project Management



115 hours

This Course is designed to introduce the skills or enhance the skills of a Project Manager; it is beneficial for anyone that has recently entered or about to enter into a project management role. Includes performance tasks to assist the learning process.

- Introduction to Project Management
- Safety
- Interpersonal Skills
- Issues and resolutions
- Construction Documents
- Construction Planning
- Estimating and Control
- Scheduling
- Resource Control
- Quality Control

APM101 - Accelerated Project Management



32 hours

This expedited course is designed for busy professionals combining class instruction with weekly assignments completed at your leisure. It will introduce the skills or enhance the skills of a Project Manager. It is beneficial for anyone that has recently entered or about to enter into a project management role. Includes performance tasks to assist the learning process.

- Introduction to Project Management
- Safety
- Interpersonal Skills
- Conflict and resolutions
- Construction Documents
- Construction Planning
- Estimating and Control
- Scheduling
- Resource Control
- Quality Control

BLR101 - Blueprint Reading



16 hours

- Terms, components, & symbols of construction drawings
- Reading specification associates with drawings and Quantity takeoffs
- Commercial, Residential, Trade, and Civil, Structural and Life Safety Drawings

EST101 - Estimating

28 hours

This Course is designed to help Trainees become familiar with the bid/estimating process, from initial bid meeting until bid day. Individual problems will be used at each stage to practice the new topic, along with a continuing project which runs the entire course and be completed per stage as each new topic is mastered.

- Project Manual Documents
- Understanding the Bidding Process
- Computer Software in Estimating
- Home Office Overhead vs. Job Overhead
- Calculate Labor Costs
- Request for Quote (RFQ) & Scope of Work for Subcontractors
- Estimate Quantities of Landscaping, Granular Base, & Asphalt
- Estimate Quantity & Cost of Concrete
- Estimate Quantity & Cost of Masonry
- Estimate Quantity & Cost of Structural Steel
- Estimate Quantity & Cost of Wood
- Estimate Waterproofing, Damp Roofing, Insulation, & Roofing
- Estimate Doors, Windows, & Storefront
- Estimate Wall Board, Plaster, Drywall, Steel Studs, Flooring, & Painting
- Price & Subcontract Electrical, Plumbing, & HVAC
- Add Profit to Bids

Employability

8 hours

This course is designed to help trainees improve their ability to obtain and maintain employment.

- Work Ethic
- Tardiness
- Absenteeism
- Conflict Resolution
- Criticism
- Harassment
- Drug & alcohol abuse
- Planning for employment
- Resume & other required paper work
- Job search
- Completing an application
- The interview

Communications

8 hours

This course is designed to teach the mechanic of how communication happens. Also included are how to make and record various common methods of communication.

- Mechanics of communication
- Paraphrasing
- Active & passive listening
- Body language
- When to communicate
- Phones and messages
- Recording conversations
- Emails & texts



Professional Development Courses



BUS101 - Business for Contractors

32 hours

This Course is designed to help Trainees become familiar with business, business development, marketing, contractual, HR elements of running a construction company. Legal and licensing requirements will also be covered.

- Conduct Sales Calls
- Contract with Subcontractors
- Develop & Implement a Business Plan
- Review & Purchase Required Insurance a Company
- Develop a Personnel Manual
- Conduct Performance Reviews of Employees
- Hire / Fire Trade Employees
- Develop a Financial Plan
- Develop an Annual Budget
- Maintain Accounting Journals
- Use Job-cost Reports
- Develop a Marketing Plan
- Obtain License as Required
- Resolve Conflicts between Company & Client
- Apply for Building Permits
- Explain Warranties to Your Client
- Provide Lien Waivers

CPR / AED / Basic First Aid

(in-person practical required)



4 hours

- adult CPR
- the use of the Automatic External Defibrillator (AED)
- basic first aid

OSHA Authorized Training for 10 Hour Construction Course



10 hours

-Topics

- Introduction to OSHA - OSHA Focus Four
- Falls - Electrocutions
- Struck-By - Caught-In or Between
- Personal Protective Equipment
- Health Hazards In Construction

-Electives Can Include:

- Cranes - Derricks - Hoists, Elevators & Conveyors
- Excavations - Materials Handling - Storage - Use & Disposal
- Scaffolds - Stairways & Ladders
- Tools - Hand & Power
- Other Optional Hazards or Policies Relevant to your Organization



Professional Development Courses

OSHA Authorized Training for 30 Hour Construction Course



30 hours

-Topics

- Introduction to OSHA - Managing Safety & Health - OSHA Focus Four
- Falls - Electrocutions
- Struck-By - Caught-in or Between
- Personal Protective & Life Saving Equipment
- Health Hazards In Construction
- Stairways & Ladders

-Electives Can Include:

- Concrete & Masonry Construction
- Confined Space Entry
- Cranes - Derricks - Hoists, Elevators & Conveyors
- Ergonomics - Excavations
- Fire Protection & Prevention
- Materials Handling, Storage, Use & Disposal
- Motorized Vehicles, Mechanical Equipment - Power Industrial Vehicles
- Safety & Health Programs
- Scaffolds

CEP101 - Contractors Exam Preparation Course



8 hours

This Course is designed to assist the trainee as to how to prepare for the Virginia Contractors Licensing Exam.

- What hours and experience are required in order to sit for the exam
- Applying to take the Exam
- Pre-Exam Preparation approaches
- What to study ahead of the Exam
- How to study for the exam
- What Definitions to become familiar with
- What is allowed and not allowed while taking the Exam
- Helpful hints while taking the Exam
- Exam Question Sampling

CBK101 - Bookkeeping for Contractors



32 hours

This Course is designed to cover all the essential accounting and financial management principles to run a successful construction company.

- Financial Management
- Construction Accounting Systems
- Making Financial Decisions
- Managing Costs, Profits and Cash Flow

Customized Courses

Cold-Formed Steel Framing

15 hours

- Materials and Tools
- Fasteners
- Materials Take off
- Layout and Installation of Steel Framed Walls
- Steel Floor & Ceiling Systems
- Overview of Steel Roof Systems

Drywall Installation

12.5 hours

- Drywall Assembly Components
- Drywall Installation
- Rated vs. Nonrated Assemblies
- Estimating Drywall

Acoustical Ceilings

20 hours

- Establish a level line
- Explain the common terms related to sound waves and acoustical ceiling materials
- Identify the different types of suspended ceilings
- Interpret plans related to ceiling layout
- Sketch the ceiling layout for a basic suspended ceiling
- Perform a material takeoff for a suspended ceiling. Installation of suspended ceilings

Trim

8 hours

- Miter Saw Review
- Angle Calculations
- Coping Saw Practice
- Various Trim Installations
- Includes Base Trim
- Window and Door Trim
- Chair Rail and Built-up Chair Rail
- Crown Molding
- Turn Back Ends Stressed



Customized Courses



Drywall Finishing

20 hours

- Finishing Standards
- Finishing Materials
- Finishing Tools
- Finishing Procedures
- Estimating Drywall Finishing Materials



Building Technology for Professional Property Maintenance

15 hours

- General Building Construction Technology Concepts
- Carpentry Maintenance
- Electrical Maintenance
- Plumbing Maintenance
- HVAC/Preventive Maintenance
- Landscape Maintenance
- Appliance Repair

Let us help you create customized training that meets the specific needs of your company. If your team is in need of targeted training, focused on the operations of your particular organization, Build Smart Institute can create curriculum that meets the industry standards.

BSI E-Learning Portal

Build Smart Virtual



Independent Study

Visit www.buildsmartinstitute.com, and click onto BuildSmartVirtual Learning Login for a free sample of some of the virtual lessons. This is a small example of some of the virtual programs.

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