

Residential Construction

Course Number 17003

Rational Statement:

Students will gain in depth knowledge of residential construction by learning the National Center for Construction Education & Research (NCCER) competencies/objectives, (Examples are NCCER tasks that the student may complete some or all of).

Suggested Grade Level: 11-12

Topics Covered:

- Industry safety procedures
- Math skills
- Blue print reading & basic survey techniques
- Wood building materials, fasteners, and adhesives
- Hand, power, and pneumatic tools
- Concrete construction applications
- Framing of flooring systems, walls & ceilings, & roofing systems
- Installation of windows and exterior doors
- Exterior finishing
- Roofing application
- Thermal and moisture protection
- Drywall installation and finishing
- Interior finish work
- Cabinet Installation
- Stairs
- Basic residential electric and plumbing
- Career exploration

Indicator #1: Understand and apply industry safety procedures	
Bloom's Taxonomy Level	Standard and Examples
Application	RC1.1 Demonstrate the proper industry safety standards. Examples: <ul style="list-style-type: none">• Complete 10 hour OSHA (Occupational Safety Health Administration) certification.• Demonstrate the use of protective clothing and safety equipment• Explain the function Material Safety Data Sheets (MSDS)• Explain and practice Lockout/Tagout procedures• Know and follow the safety requirements for working in confined spaces• Maintain a written portfolio record of written safety examinations and equipment examinations for which the student has passed

Indicator #2: Utilize appropriate industry math skills and formulas	
Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC2.1 Understand and demonstrate basic math skills.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Add, subtract, multiply, and divide whole numbers with and without a calculator • Add, subtract, multiply, and divide fractions • Add, subtract, multiply, and divide decimals, with and without a calculator • Convert decimals to percents and percents to decimals • Convert fractions to decimals and decimals to fractions • Calculate the necessary unit of measure for a project
Indicator # 3: Understand concepts of blueprint reading and perform basic survey techniques	
Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC3.1 Demonstrate how to read blue prints.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Describe the types of drawings usually included in a set of plans and list the information found on each type • Identify the different types of lines used on construction drawings • Identify selected architectural symbols commonly used to represent materials on plans • Identify selected electrical, mechanical, and plumbing symbols • Read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings • Demonstrate or describe how to perform a quantity takeoff for materials
Application	<p>RC3.2 Demonstrate basic survey techniques and site layout.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Describe the major responsibilities of the carpenter relative to site layout • Convert measurements stated in feet and inches to equivalent measurements stated in decimal feet, and vice versa • Use taping and/or chaining equipment and procedures to make distance measurements and perform site layout tasks • Use a builder's level or transit and differential leveling procedures to determine site and building elevations • Check and/or establish 90 degree angle using the 3/4/5 rule

Indicator # 4: Identify and understand wood building materials, fasteners, and adhesives	
Bloom's Taxonomy Level	Standard and Examples
Comprehension	<p>RC4.1 Understand and demonstrate the use of wood building materials.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Explain the terms commonly used in discussing wood and lumber • Identify various types of imperfections that are found in lumber • Interpret grade markings on lumber and plywood • Identify the uses of and safety precautions associated with pressure-treated lumber • State the uses of various types of engineered lumber
Comprehension	<p>RC4.2 Understand and demonstrate the use of fasteners and adhesives.</p> <p>Examples:</p> <ul style="list-style-type: none"> • List the basic nail and staple types and their uses • Identify the different types of anchors and their uses • Describe the common types of adhesives used in construction work and explain their uses

Indicator #5: Identify and correctly use appropriate hand, power and pneumatic tools	
Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC5.1 Demonstrate safe and proper use of hand tools.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify the hand tools commonly used by t carpenters and describe their use • Use hand tools in safe and appropriate manner
Application	<p>RC5.2 Demonstrate safe and proper use of power tools.</p> <p>Examples:</p> <ul style="list-style-type: none"> • State the general safety rules for operating all power tools, regardless of type • State the general rules for maintaining all power tools • Identify the portable power tools used and describe their uses • Use portable power tools in a safe and appropriate manner

Application	<p>RC5.3 Demonstrate safe and proper use of pneumatic tools.</p> <p>Examples:</p> <ul style="list-style-type: none"> • State the general safety rules for operating all pneumatic tools • State the general rules for maintaining all pneumatic tools • Use pneumatic tools in a safe and appropriate manner
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Indicator #6: Integrate concrete technology to achieve thorough construction background

Bloom's Taxonomy Level	Standard and Examples
Comprehension	<p>RC6.1 Understand and demonstrate the uses of concrete and reinforcing materials.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Perform volume estimates for concrete quantity requirements • Identify types of concrete reinforcement bars and describe their use • Identify types of reinforcement bar supports and describe their use • Recognize four kinds of footings – Continuous or spread, stepped, pier, grade beam • Recognize types of concrete placements that require the construction of edge forms – Slabs with or without a foundation, driveways, sidewalks, approaches • Explain the purpose of a screed and identify the different types of screeds • Identify and explain the different concrete curing methods • Explain the safety procedures associated with using concrete forms

Indicator #7: Understand and perform framing of flooring systems, wall and ceilings and roofing systems

Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC7.1 Understand and demonstrate framing of flooring systems.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Read and understand drawings and specifications to determine floor system requirements • Identify floor and sill framing and support members • Name methods used to fasten sills to the foundation • List and recognize different types of floor joists • List and recognize different types of flooring materials • Explain the purposes of subflooring and underlayment • Match selected fasteners used in floor framing to their correct uses • Demonstrate the ability to – Layout and construct a floor assembly, install joists for a cantilever floor, install a single floor system using tongue and groove plywood/OSB panels

Application	<p>RC7.2 Understand and demonstrate framing of wall and ceiling systems.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify the components of a wall and ceiling layout • Describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window partition T's bracing, and firestops • Describe the correct procedure for assembling and erecting and exterior wall • Describe the common materials and methods used for installing sheathing on walls • Layout, assemble, erect, and brace exterior walls for a frame building
Application	<p>RC7.3 Understand and demonstrate framing of a roofing systems.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Understand the terms associated with roof framing • Identify the roof framing members used in gable and hip roofs • Identify the various types of trusses used in roof framing • Use rafter framing square, speed square, and calculator in laying out a roof • Identify various types of sheathing used in roof construction • Erect a gable roof using trusses

Indicator #8: Understand and demonstrate installation of windows and exterior doors	
Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC8.1 Understand and demonstrate installation of windows.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify various types of fixed, sliding and swinging windows • Identify the parts of a window installation • State the requirements for a proper window installation • Install a pre-hung windows
Application	<p>RC8.2 Understand and demonstrate installation of exterior doors.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify the common types of exterior doors and explain how they are constructed • Identify the types of thresholds used with exterior doors • Install a pre-hung exterior door with weather-stripping • Identify the various types of locksets used on exterior doors and explain how they are installed • Install a lockset

Indicator #9: Identify and perform different exterior finishing methods	
Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC9.1 Understand and demonstrate installation of exterior finish.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Describe the purpose of wall insulation and flashing • Identify the types and parts of common cornices • Demonstrate the installation of selected common cornices • Demonstrate lap and panel siding estimating methods • Describe the types and applications of common siding • Install selected types of common siding

Indicator #10: Identify and understand different roofing applications	
Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC10.1 Understand and demonstrate installation of roofing materials.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify the material and methods used in roofing • Explain the safety requirements for roof jobs • Install fiberglass shingles on gable and hip roofs • Close up a valley using fiberglass shingles • Explain how to make various roof projections watertight when using fiberglass shingles

Indicator #11: Understand the importance and properly install thermal and moisture protection	
Bloom's Taxonomy Level	Standard and Examples
Analysis	<p>RC11.1 Understand and demonstrate installation of thermal and moisture protection.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Describe the requirements for insulation • Describe the characteristics of various types of insulations material • Calculate the required amounts of insulation materials • Describe the requirements for moisture control and ventilation • Install selected vapor barriers • Describe the various methods of waterproofing • Describe air infiltration control requirements • Install selected building wraps

Indicator #12: Properly perform drywall installation and finishing techniques	
Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC12.1 Understand and demonstrate drywall installation.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify the different types of gypsum wallboard (drywall) and their uses • Select the type and thickness of drywall required for specific installations • Select fasteners for drywall installation • Explain the fastener schedules for different types of drywall installations • Perform single-layer drywall installations
Comprehension	<p>RC12.2 Understand and demonstrate drywall finishing.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify the hand tools used in drywall finishing and demonstrate the ability to use these tools • Identify the automatic tools used in drywall finishing • Identify the materials used in drywall finishing

Indicator #13: Understand methods and complete interior finish work	
Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC13.1 Understand and demonstrate interior finishing.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify various types of door jambs and frames and demonstrate the installation procedures for placing selected door jambs and frames in different types of interior partitions • List and identify specific items included on a typical door schedule • Demonstrate the procedure of placing and hanging a selected door • Identify the different types of standard moldings and describe their uses • Make square and miter cuts using a miter box or power miter saw • Make coped joint cuts using a coping saw • Install interior trim, including – Door trim, window trim, base trim, ceiling trim

Indicator #14: Understand the cabinet manufacturing process and install cabinets, countertops and back splashes

Bloom's Taxonomy Level	Standard and Examples
Comprehension	<p>RC14.1 Understand basic cabinet design and installation.</p> <p>Examples:</p> <ul style="list-style-type: none"> • State the classes and sizes of typical base and wall kitchen cabinets • Recognize the common types of woods used to make cabinets • Identify cabinet components and hardware and describe their purpose • Install factory made cabinets, countertops, and backsplashes

Indicator #15: Using appropriate math formula calculate the number and sizes of risers and treads for a stairway and layout and cut stringers and identify the various types and parts of stairs

Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC15.1 Understand and demonstrate installation of stairs.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify the various types of stairs • Identify the various parts of stairs • Identify the materials used in the construction of stairs • Interpret construction drawings of stairs • Explain the methods of constructing various types of stairs • Understand the various terms and definitions relating to stairs • Lay out and cut stringers • Determine the number and sizes of risers and treads required for a stairway

Indicator #16: Study the principles and standards of Basic Residential Electric and Plumbing applications	
Bloom's Taxonomy Level	Standard and Examples
Comprehension	<p>RC16.1 Understand and demonstrate basic residential electric and plumbing applications.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Interpret basic electric and plumbing codes • Identify basic residential wiring and plumbing symbols on construction drawings • Understand the need to construct a residential dwelling to accommodate residential wiring and plumbing applications • Identify safety requirements when working around electric and plumbing applications • Construct a basic residential plumbing project • Construct a basic residential wiring project

Indicator #17: Student will participate in career exploration activities	
Bloom's Taxonomy Level	Standard and Examples
Application	<p>RC17.1 Research career opportunities in the Architecture and Construction fields.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Utilizing the career exploration software research and write a report on career opportunities in the manufacturing field • Utilizing the career exploration software to research educational requirements for a chosen career path • Utilizing career exploration software, update the students portfolio