STRANDS AND STANDARDS
RESIDENTIAL CONSTRUCTION 2

Course Description

This course provides comprehensive training in essential construction skills, focusing on safety, tools, equipment, and foundational techniques. The curriculum covers shop safety, tools and equipment, applied math, construction plans, codes and regulations, wall systems, floor and stair systems, roof systems, building envelope, and interior finishes. Participants will learn to identify and mitigate safety hazards, use and maintain construction tools, accurately measure and mark projects, interpret construction plans, ensure compliance with codes and regulations, frame walls, floors, and roofs, install exterior and interior finishes, and manage building envelopes. The course equips participants with the knowledge and skills necessary for safe and effective construction practices in various roles within the construction industry.

Intended Grade Level	9-12
Units of Credit	0.5-1.0
Core Code	40.08.00.00.402
Concurrent Enrollment Core Code	40.08.00.13.402
Prerequisite	Residential Construction 1
Skill Certification Test Number	N/A
Skill Certification Cut Score	**N/A**
Test Weight	N/A
License Area of Concentration	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Carpentry
Endorsement 2	Construction Management
Endorsement 3	Residential Construction

Updated: August 2025

STRAND 1: SHOP SAFETY

Students will learn and practice basic construction safety skills.

Standard 1

Identify potential safety hazards in a construction site or shop space.

- Power tools
- Hand tools
- Shop/Site Behavior
- Chemicals

Standard 2

Explain ways to mitigate safety concerns in a construction site or shop space.

- Training
- Procedures
- Cleanliness
- Personal Protective Equipment (PPE)

Performance Skills

- Perform a shop or site safety audit and report recommended solutions to potential hazards.
- Demonstrate safety practices and procedures based on regulations and requirements when working on a site or constructing a project.

STRAND 2: TOOLS & EQUIPMENT

Students will explore classifications of tools and their applications in construction.

Standard 1

Explain the uses of common construction tools and equipment.

- Hand tools
- Portable power tools
- Stationary tools
- Mobile equipment/machinery

Standard 2

List the proper care and maintenance procedures for common construction tools and equipment.

- Hand tools
- Portable power tools
- Stationary tools
- Mobile equipment/machinery

Standard 3

Discuss the types of power sources for tools and equipment.

- Corded
- Battery
- Pneumatic
- Hydraulic
- Combustion

Performance Skills

- Demonstrate safe and appropriate use of common construction tools and equipment when working on projects.
- Demonstrate proper care and maintenance of tools and equipment when working on projects.
- Pass relevant safety test(s) with 100% accuracy.

STRAND 3: CONSTRUCTION MATH

Students will use various construction measuring devices to accurately measure, calculate, and mark projects.

Standard 1

Demonstrate basic measurements in relation to construction.

- Square footage (flooring, sheetrock, etc.)
- Cubic yards (concrete, dirt, etc.)
- Conversions (feet, yards, inches, etc.)

Standard 2

Demonstrate use of measuring devices and methodologies.

- Traditional measuring tools (tape, optical transit, etc.)
- Electronic measuring tools (laser, GPS, etc.)
- Squaring tools (speed, framing, etc.)
- Leveling tools (bubble, laser, plumbob, etc.)

Performance Skills

- Accurately measure and mark within 1/16”.
- Accurately add, subtract, and divide measurements.
- Accurately convert between inches, feet, and yards.
- Accurately convert between civil and architectural units.
- Accurately calculate volumes and areas.
- Accurately square a project using various methods.
- Calculate the amount of materials required for a given construction project.
- Estimate the cost of materials for a given construction project.

STRAND 4: CONSTRUCTION PLANS

Students will read and interpret structural drawings, codes, specifications, and other construction documentation.

Standard 1

Identify and describe various types of construction drawings, including their fundamental components and features.

Standard 2

Identify various types of construction drawings.

Standard 3

Identify and describe the purpose of the five basic construction drawing components.

Standard 4

Identify and explain the use of dimensions and various drawing scales.

Standard 5

Explain the importance of specifications, including CSI Master format.

Standard 6

List items commonly shown on architectural drawings.

Standard 7

Describe information typically shown on structural drawings.

Standard 8

Explain the importance of referencing mechanical, electrical, and plumbing plans.

Standard 9

Identify and explain the significance of various drawing elements, such as lines of construction, symbols, and grid lines.

Performance Skills

- Read and interpret a civil drawing, specification, or other construction documentation.
- Demonstrate dimensions and drawing scales for a given project.
- Construct a three-dimensional construction project from a set of construction plans..

STRAND 5: CODES & REGULATIONS

Students will explore the impact of codes and regulations on construction projects.

Standard 1

Discuss the roles of codes and regulations on construction.

Standard 2

Discuss methods for ensuring construction projects meet legal requirements (local, state, and national building codes).

Standard 3

Describe procedures for obtaining a permit for construction projects.

Standard 4

Investigate best practices when coordinating inspections at various stages in the construction process.

Standard 5

Explain how a given construction project adheres to compliance standards.

- Regulations
- Safety
- Environmental
- Accessibility

Standard 6

Explore zoning laws and how they affect the use of land and types of structures that can be built in specific areas.

Performance Skills

- Maintain thorough records of permits, inspections, and compliance documentation for a construction project.
- Communicate with regulatory authorities, inspectors, and other stakeholders to ensure smooth project progression and address any issues that arise.
- Identify and resolve issues related to permits, inspections, and compliance to keep a project on track.

STRAND 6: WALL SYSTEMS

Students will demonstrate the procedures for laying out and framing walls, including roughing-in door and window openings, constructing corners and partition Ts, bracing walls, and applying sheathing.

Standard 1

Identify the components of a wall system.

- Studs
- Plates
- Sheathing
- Insulation
- Vapor barrier
- Exterior cladding
- Interior finish
- Noggins
- Bracing
- Windows & doors

Standard 2

Compare wood and metal frames.

- Budget
- Environmental conditions
- Aesthetic preferences
- Project requirements and applications

Standard 3

Describe the correct procedure to lay out, assemble, erect, and brace exterior walls for a frame building.

Standard 4

Describe wall framing techniques used in masonry construction.

Standard 5

Explore alternative wall systems.

Standard 6

Compare standard and alternative interior wall systems.

- Materials
- Insulation
- Construction speed
- Aesthetics
- Sustainability

Standard 7

Describe modern masonry materials and techniques.

Standard 8

Explain how to mix mortar and lay masonry units.

Standard 9

Describe how to install both brick and concrete masonry units.

Performance Skills

- Correctly install sheathing on a wall.
- Prepare a rough opening for proper window installation.
- Prepare a rough opening for proper door installation.
- Frame the walls of a structure in compliance with codes and regulations.
- Efficiently manage time to complete building walls within the project timeline.
- Conduct a wall inspection to ensure all components meet quality standards.
- Identify and resolve issues related to a wall during construction.
- Effectively communicate with clients, architects, engineers, and regulatory authorities to ensure the walls meet all requirements.

STRAND 7: FLOOR & STAIR SYSTEMS

Students will demonstrate procedures and methods for installing floor and stair systems.

Standard 1

Identify the different types of framing systems.

- Platform-framed
- Trus Joist® I-Joists (TJI), I-Beam, and other trusses.
- Post-and-beam

Standard 2

Label floor system components and their functions.

- Sill plate
- Beams
- Girders
- Supports
- Joists
- Bridging
- Underlayment
- Subfloor
- Shields & sealers

Standard 3

Describe the construction methods and procedures for installing common floor system components.

Standard 4

Label the structural components of stairs and their functions.

- Treads
- Risers
- Stringers
- Handrail

Standard 5

Discuss load-bearing principles and how to reinforce stairs for stability.

Performance Skills

- Estimate the amount of material to frame a floor assembly from a set of plans.
- Lay out and construct a floor assembly, including a rough opening and subfloor material.
- Frame a floor system in compliance with codes and regulations..
- Construct a stair system in compliance with codes and regulations.
- Efficiently manage time to complete floor and stair work within the project timeline.
- Conduct a floor and stair inspection to ensure all components meet quality standards.
- Identify and resolve issues related to the floor and stairs during construction.
- Effectively communicate with clients, architects, engineers, and regulatory authorities to ensure the floor and stairs meet all requirements.

STRAND 8: ROOF SYSTEMS

Students will demonstrate procedures and methods for installing floor systems.

Standard 1

Identify common types of roofs used in residential construction.

- Gable
- Dutch Hip
- Flat
- Shed

Standard 2

Describe the use of trusses in basic roof framing.

- Types
- Components
- Installation
- Bracing

Standard 3

Illustrate the steps to erecting a gable roof.

- Rafters
- Dormers
- Framing Square
- Openings
- Sheathing

Standard 4

Label the components of ceiling framing and their functions.

Standard 5

Describe how to perform a material takeoff for a roof.

Standard 6

Compare the different roofing system materials and their preferred applications.

- Composition
- Roll-roofing
- Wood shakes and shingles
- Tile/slate
- Metal
- Built-up
- Single ply
- Fasteners used on roofing projects.

Standard 7

Describe the installation techniques for common roofing systems.

- Roof deck
- Underlayment and waterproof membrane
- Drip edge
- Flashing
- Roof ventilation
- Composition shingles
- Metal roofing
- Roll roofing

Performance Skills

- Frame a roof in compliance with codes and regulations.
- Efficiently manage time to complete roofing work within the project timeline.
- Conduct a roof inspection to ensure all components meet quality standards.
- Identify and resolve issues related to the roof during construction.
- Effectively communicate with clients, architects, engineers, and regulatory authorities to ensure the roof meets all requirements.

STRAND 9: BUILDING ENVELOPE

Students will analyze methods and materials used in the building envelope.

Standard 1

Assess how air, moisture, heat, and light interact with building materials and systems.

Standard 2

Compare common materials used in building envelopes.

- Insulation (interior, exterior, extruded, expanded, etc.)
- Vapor barrier
- Cladding
- Sealants

Standard 3

Discuss the impacts building envelopes have on a structure.

- Energy efficiency
- Weather protection
- Moisture control
- Airflow management

Standard 4

Identify trims used in exterior insulation and finish systems (EIFS).

Standard 5

Distinguish between traditional and water management EIFS.

Standard 6

Distinguish between traditional hard-coat plaster and synthetic finishes.

Standard 7

Describe building features commonly created with glass fiber reinforced concrete (GFRC).

Performance Skills

- Demonstrate the proper use of bonding agents, sealers, and sealants.
- Install insulation materials in compliance with codes and regulations.
- Efficiently manage time to complete building envelope work within the project timeline.
- Conduct a building envelope inspection to ensure all components meet quality standards.
- Identify and resolve issues related to the building envelope during construction.
- Effectively communicate with clients, architects, engineers, and regulatory authorities to ensure the building envelope meets all requirements.

STRAND 10: INTERIOR FINISHES

Students will explore common interior finishes and related functional components.

Standard 1

Explore various interior finishes and their impact on the aesthetics and functionality of a space.

- Wall detailing
- Flooring
- Ceiling detailing
- Trim and molding
- Cabinetry and millwork
- Countertops

Standard 2

List the steps for preparing interior surfaces for finish work (sanding, priming, cleaning, etc.)

Standard 3

Assess various materials and their appropriateness for a specific finish project.

- Drywall
- Paint
- Trim
- Flooring

Standard 4

Show installation techniques for various interior finishes.

- Trim
- Molding
- Cabinetry
- Flooring

Performance Skills

- Identify and resolve issues that arise during the finishing process.
- Efficiently manage time to complete finish work within the project timeline.
- Identify and resolve issues related to the building envelope during construction.
- Effectively communicate with clients, designers, and other team members to ensure that finishes meet expectations and specifications.

STRAND 11: CTSOs & DURABLE SKILLS

Students will be encouraged to participate in a relevant CTSO (Career & Technical Student Organization) through the demonstration of construction workplace and career readiness skills. These standards will not appear on state skill certification exams, but should be taught throughout the duration of the course.

Standard 1

Students will display personal skills related to the essential values, personality traits, and personal characteristics for success in the construction profession and life.

- **Integrity** - demonstrate honesty and personal responsibility for actions.
- **Work ethic** - demonstrate tenacity, hard work, excellence, punctuality, meet deadlines; and be self-directed when completing tasks in the construction professional setting.
- **Professionalism** - demonstrate maturity, self-confidence; and a positive image when working with teammates or clients on construction projects.
- **Responsibility** - demonstrate dependability, consistency, and personal well-being when safely completing construction tasks.
- **Adaptability/Flexibility** - Foster creativity, new ideas, and resilience when working to solve problems in construction projects.
- **Self-motivated** - demonstrate a willingness to learn, independence, initiative, and a positive attitude when approaching new information

Standard 2

Students will display workplace skills related to the essential attitudes and abilities for success in the construction profession.

- **Communication** – Demonstrates skills in listening and speaking; communicates professionally with teammates, supervisors, and customers in relation to construction projects.
- **Decision making** – Analyzes key facts, data, and situations to employ reasoning skills for completing construction tasks.
- **Teamwork** – Builds trusting relationships, works cooperatively with others and utilizes individual strengths of team members when completing construction tasks.
- **Planning, organizing, and management** – Designs, prepares, and implements creative tasks within a desired timeframe; Sets priorities and responds to changing priorities.
- **Leadership** – Builds positive relationships and mitigates conflict.

Standard 3

Students will display technical skills that are grounded in design that deliver essential knowledge and competencies for success in the industry.

- **Computer and technology literacy**
- **Job specific skills**
- **Safety and health**
- **Service orientation** – responds to internal and external customers; demonstrates focus and presence; attends to personal matters away from the classroom.
- **Professional development** – demonstrates openness to learn, grow, and change in the construction industry.

Industry Test Points by Strand

Test Name	Test #	Number of Test Points by Strand										Total Points	Total Questions
		1	2	3	4	5	6	7	8	9	10		