COMMERCIAL & RESIDENTIAL CONSTRUCTION TECHNOLOGY
MISSISSIPPI CURRICULUM FRAMEWORK

Program CIP: 46.0401-Building/Property Maintenance

2021

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The Office of Curriculum and Instruction (OCI) was founded in 2013 under the Division of Workforce, Career, and Technical Education at the Mississippi Community College Board (MCCB). The office is funded through a partnership with The Mississippi Department of Education (MDE), who serves as Mississippi's fiscal agent for state and federal Career and Technical Education (CTE) Funds. The OCI is tasked with developing statewide CTE curriculum, programming, and professional development designed to meet the local and statewide economic demand.

For information, please contact curriculum@mccb.edu

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NATIONAL CERTIFICATION & STANDARDS

The National Center for Construction Education and Research

NCCER is a not-for-profit 501(c)(3) education foundation created in 1996 as The National Center for Construction Education and Research. It was developed with the support of more than 125 construction CEOs and various association and academic leaders who united to revolutionize training for the construction industry. Sharing the common goal of developing a safe and productive workforce, these companies created a standardized training and credentialing program for the industry. This progressive program has evolved into curricula for more than 70 craft areas and a complete series of more than 70 assessments offered in over 4,000 NCCER-accredited training and assessment locations across the United States.

NCCER develops standardized construction and maintenance curriculum and assessments with portable credentials. These credentials are tracked through NCCER's Registry System that allows organizations and companies to track the qualifications of their craft professionals and/or check the qualifications of possible new hires. NCCER's Registry System also assists craft professionals by maintaining their records in a secure database.

For more information, please visit www.nccer.org.

Precision Exams

YouScience was created as an innovative aptitude and career discovery tool. With its recent merger with Precision Exams, the focus incorporates industry-recognized certifications. Precision Exams targets instilling hope, purpose, and direction by connecting natural talent, skills, and knowledge with in-demand education pathways and careers.

For more information, please visit https://www.youscience.com/certifications/.

Industry Job Projection Data

A summary of occupational data is available from the Mississippi Department of Employment Security.

https://mdes.ms.gov/information-center/labor-market-information/

Articulation

Articulation credit from Secondary Carpentry to Postsecondary Commercial Residential Maintenance will be awarded upon implementation of this curriculum by the college. Local agreements and dual credit partnerships are encouraged.

The course to be articulated is Carpentry (CRM 1214) with the stipulation of passing the MS-CPAS3.

Articulated Secondary Program	Postsecondary Program	Articulated Postsecondary Course
S 2015 Carpentry (CIP: 46.0201)	PS 2018 Commercial Residential Maintenance (CIP: 46.0401)	CRM 1214 Carpentry

Technical Skills Assessment

Colleges should report the following for students who complete the program with a career certificate, technical certificate, or an Associate of Applied Science Degrees for technical skills attainment. To use the approved Alternate Assessment for the following programs of study, colleges should provide a Letter of Notification to the Director of Career Technical Education at the MS Community College Board. Please see the following link for further instructions: http://www.mccb.edu/wkfEdu/CTDefault.aspx.

CIP Code	Program of Study
46.0401	Commercial Residential Maintenance
Level	**Assessment**
Accelerated /15 Hour	
Level	**Assessment**
Career	Carpentry Certification **OR** NCCER Core NCCER Carpentry Level I
Level	**Assessment**
Technical/AAS	Construction Trade Foundation **OR** Carpentry Certification

***Colleges will select the assessment based on the demands of their industry.**

For more information, please visit www.nccer.org

For more information, please visit https://www.youscience.com/certifications/.

Research Abstract

In the spring of 2021, the Office of Curriculum, Instruction, and Assessment met with the different industry members who made up the advisory committees for the Commercial Residential Maintenance program. An industry questionnaire was used to gather feedback concerning the trends and needs, both current and future, of their field. Program faculty, administrators, and industry members were consulted regarding industry workforce needs and trends.

Industry advisory team members from the college involved with this program were asked to give input related to changes to be made to the curriculum framework. Specific comments related to soft skills needed in this program include a willingness to work with others, being at work every day and on time, and having math skills to complete work orders and other forms. Occupation-specific skills stated include knowing how to communicate with the customers, basic math skills, and troubleshooting with customer concerns.

Revision History

2011, Research and Curriculum Unit, Mississippi State University
2018, Office of Curriculum and Instruction, Mississippi Community College Board
2021, Office of Curriculum, Instruction, & Assessment, Mississippi Community College Board

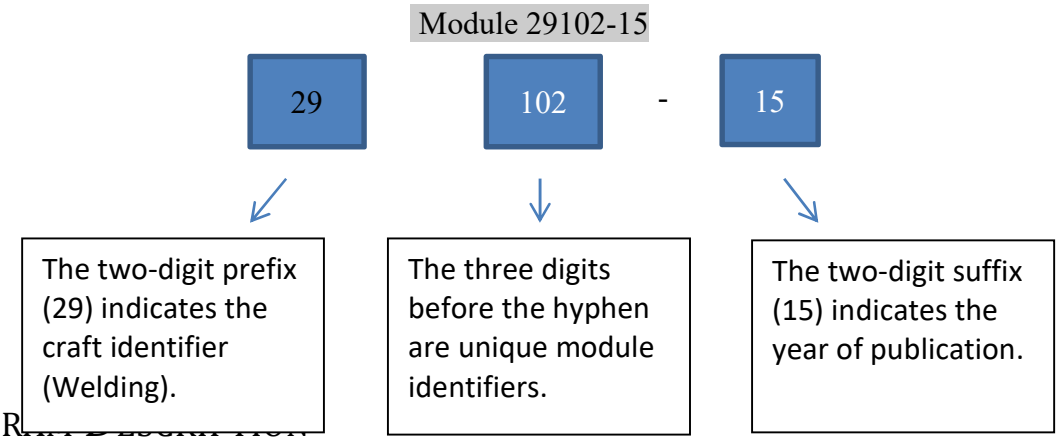
CREDIT BY EXAMINATION

The following **NCCER** modules are aligned to courses listed below. Each module will serve as the state recommended exam to reward credit for prior learning experiences. Colleges have the local autonomy to create a college-level exam when awarding credit.

Course Number and Name	NCCER Credential and Module
CTE 1143 Fundamentals of Construction OR CRM 1112 Industrial Maintenance Core and Safety	NCCER Core Curriculum 1. Module 00101-15 Basic Safety 2. Module 00102-15 Introduction to Construction Math 3. Module 00103-15 Introduction to Hand Tools 4. Module 00104-15 Introduction to Power Tools 5. Module 00105-15 Introduction to Construction Drawing 6. Module 00106-15 Basic Rigging 7. Module 00107-15 Basic Communication Skills 8. Module 00108-15 Basic Employability Skills 9. Module 00109-15 Introduction to Materials Handling
CRM 1215 Carpentry	NCCER Carpentry Level 1 Modules 1. Module 27103-13 Hand & Power Tools 2. Module 27104-13 Introduction to Construction Drawings, Specifications, & Layouts 3. Module 27105-13 Floor Systems 4. Module 27109-13 Introduction to Building Envelope Systems 5. Module 27110-13 Basic Stair Layout 6. Module 27111-13 Wall Systems 7. Module 27112-13 Ceiling Joist and Roof Framing
CRM 1223 Surface Finishes	NCCER Carpentry Level 1 Module 1. Module 27102-13 Building Materials, Fasteners, & Adhesives

How to Decode a Module Number

NCCER module numbers are divided into three parts. This structure allows users to easily track training histories and revisions from one edition to the next.



PROGRAM DESCRIPTION

The Commercial/Residential Maintenance program is designed to prepare individuals for employment opportunities in commercial and residential building general maintenance and repairs. Content of the program

includes federal, state, and local codes. In addition, basic maintenance of heating and cooling systems, electrical, plumbing, welding, and basic carpentry skills and fundamental craftwork are discussed.

Industry standards referenced are from the Best Practices for *Contren Learning Series*®, National Center for Construction Education and Research.

SUGGESTED COURSE SEQUENCE

Accelerated Integrated Career Pathway/15 Hour Certificate

			SCH Breakdown			Program Certifications
Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours	
CRM 1113 Or CTE 1143	Fundamentals of Maintenance Services or Fundamentals of Construction	3	3	0	45	
CRM 1123	Maintenance Regulations	3	3	0	45	
	All other electives approved by instructor per local community college policy	9				
	Total	**15**				

Career Certificate Required Courses

			SCH Breakdown			Program Certifications
Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours	
CRM 1113 Or CTE 1143	Fundamentals of Maintenance Services or Fundamentals of Construction	3	3	0	45	Carpentry Cert **OR** NCCER CORE
CRM 1123	Maintenance Regulations	3	3	0	45	
CRM 1133	Mathematics and Blueprint Interpretation	3	2	2	60	Construction Trades Foundation
CRM 1214	Carpentry	4	2	4	90	NCCER Carpentry Level I **OR** Carpentry Cert.
CRM 1222	Surface Finishes	2	0	2	30	NCCER Carpentry Level I **OR** Construction Trade Foundation
CRM 1413	Plumbing	3	2	2	60	
CRM 1513	Electrical	3	2	2	60	
CRM 1613	Heating, Ventilating, and Air Conditioning	3	2	2	60	
	All other electives approved by instructor per local community college policy	6				
	TOTAL	**30**	**16**	**14**	**450**	

Technical Certificate Required Courses

			SCH Breakdown			Program Certifications
Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours	
CRM 1314	Masonry	4	3	2	75	
CRM 1432	Landscape Irrigation	2	0	4	60	
CRM 1714	Special Problem in Welding	4	0	8	120	
	All other electives approved by instructor per local community college policy	5				
	Total	**15**	**3**	**14**	**255**	

General Education Core Courses

To receive the Associate of Applied Science degree, a student must complete all of the required coursework found in the Career Certificate option, Technical certificate option, and a minimum of 15 semester hours of General Education core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester or provided primarily within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science degree at their college. The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) Section 9 Standard 3 of the *Principles of Accreditation: Foundations for Quality Enhancement*[1] describes the general education core.

Section 9 Standard 3:

3. The institution requires the successful completion of a general education component at the undergraduate level that

   a) is based on a coherent rationale.

   b) is a substantial component of each undergraduate degree program. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours of the equivalent; for baccalaureate programs, a minimum of 30 semester hours or the equivalent.

   c) ensures breadth of knowledge. These credit hours include at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural science/mathematics. These courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

General Education Courses

			SCH Breakdown			Contact Hour Breakdown		Certification Information
Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours	Lecture	Lab	Certification Name
	Humanities/Fine Arts	3						
	Social/Behavioral Sciences	3						
	Math/Science	3						
	Academic electives	6						
	TOTAL	**15**						

[1] Southern Association of Colleges and Schools Commission on Colleges. (2017). *The Principles of Accreditation: Foundations for Quality Enhancement*. Retrieved from http://www.sacscoc.org/2017ProposedPrinc/Proposed%20Principles%20Adopted%20by%20BOT.pdf

APPROVED ELECTIVES

						Program Certifications
Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours	
SSP 100(2-3)	Smart Start 101	2-3				
CRM 291(1-5)	Special Projects in CRM	1-5	0	2-10	30-150	21st Century Skills
WBL 191(1-3) WBL 192(1-3) WBL 193(1-3) WBL 291(1-3) WBL 292(1-3) WBL 293(1-3)	Work-Based Learning	1-3				
	All other electives approved by instructor per local community college policy					

COURSE DESCRIPTIONS

Course Number and Name: **CRM 1113** **Fundamentals of Maintenance Services**

Description: Emphasis on basic concepts and practices in the maintenance programs for commercial and residential facilities including scheduling, work order systems, workforce management, inventory control, safety, and right-to-know programs.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	3	0	45

Prerequisite: Instructor Approved

Student Learning Outcomes:

Identify, explain, and demonstrate basic safety NCCER CORE or Construction Trades Foundation exam Standard-1

1. Explain the idea of a safety culture and its importance in the construction crafts.
2. Identify causes of accidents and the impact of accident costs.
3. Explain the role of OSHA in job-site safety.
4. Explain OSHA's General Duty Clause and 1926 CFR Subpart C.
5. Recognize hazard recognition and risk assessment techniques.
6. Explain fall protection, ladder, stair, and scaffold procedures and requirements.
7. Identify struck-by hazards and demonstrate safe working procedures and requirements.
8. Identify caught-in-between hazards and demonstrate safe working procedures and requirements.
9. Define safe work procedures to use around electrical hazards.
10. Demonstrate the use and care of appropriate personal protective equipment (PPE).
11. Explain the importance of hazard communications (HazCom) and material safety data sheets (MSDSs).
12. Identify other construction hazards on your job site, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires.

Identify, explain and use construction math NCCER CORE or Construction Trades Foundation exam Standard-1

1. Add, subtract, multiply, and divide whole numbers, with and without a calculator.
2. Use a standard ruler, a metric ruler, and a measuring tape to measure.
3. Add, subtract, multiply, and divide fractions.
4. Add, subtract, multiply, and divide decimals, with and without a calculator.
5. Convert decimals to percentages and percentages to decimals.
6. Convert fractions to decimals and decimals to fractions.
7. Explain what the metric system is and how it is important in the construction trade.
8. Recognize and use metric units of length, weight, volume, and temperature.
9. Recognize some of the basic shapes used in the construction industry and apply basic geometry to measure them.

Identify and use hand tools NCCER CORE or Construction Trades Foundation exam Standard-1

1. Recognize and identify some of the basic hand tools and their proper uses in the construction trade.
2. Visually inspect hand tools to determine if they are safe to use.
3. Safely use hand tools.

Identify and use power tools NCCER CORE or Construction Trades Foundation exam Standard-1

1. Identify power tools commonly used in the construction trades.
2. Use power tools safely.
3. Explain how to maintain power tools properly.

Identify and use construction drawings NCCER CORE or Construction Trades Foundation exam Standard-1

1. Recognize and identify basic construction drawing terms, components, and symbols.
2. Relate information on construction drawings to actual locations on the print.
3. Recognize different classifications of construction drawings.
4. Interpret and use drawing dimensions.

Identify, describe, and demonstrate basic rigging NCCER CORE or Construction Trades Foundation exam Standard-1

1. Identify and describe the use of slings and common rigging hardware.
2. Describe basic inspection techniques and rejection criteria used for slings and hardware.
3. Describe basic hitch configurations and their proper connections.
4. Describe basic load-handling safety practices.
5. Demonstrate proper use of American National Standards Institute (ANSI) hand signals.

Interpret and demonstrate basic communication skills NCCER CORE or Construction Trades Foundation exam Standard-1

1. Interpret information and instructions presented in both verbal and written form.
2. Communicate effectively in on-the-job situations using verbal and written skills.
3. Communicate effectively on the job using electronic communication devices.

Explain and demonstrate basic employability skills NCCER CORE or Construction Trades Foundation exam Standard-1

1. Explain your role as an employee in the construction industry.
2. Demonstrate critical thinking skills and the ability to solve problems using those skills.
3. Demonstrate knowledge of computer systems and explain common uses for computers in the construction industry.
4. Define effective relationship skills.
5. Recognize workplace issues such as sexual harassment, stress, and substance abuse.

Identify and apply material handling techniques NCCER CORE or Construction Trades Foundation exam Standard-1

1. Define a load.
2. Establish a pre-task plan prior to moving a load.
3. Use proper materials-handling techniques.
4. Choose appropriate materials-handling equipment for the task.
5. Recognize hazards and follow safety procedures required for materials handling.

National Standard

Construction Trades Foundation exam Standard-1 or NCCER CORE

Course Number and Name: **CRM 1123 Maintenance Regulations**

Description: Basic information on the various federal, state, and local regulations agencies that govern maintenance operations and practices, including Occupational and Safety Health Act (OSHA), Environmental Protection Agency (EPA), and American with Disabilities Act (ADA).

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	3	0	45

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Handle, store, and dispose of hazardous materials. Carpentry Certification
   a. Recognize signal words and symbols that indicate severity of a hazard.
   b. Describe methods for reducing hazardous waste.
   c. Describe procedures for storing hazardous waste.
   d. Interpret data found on a hazardous Material Safety Data Sheet.
   e. Describe general safety procedures for first aid and cleanup to follow in case of an accident involving hazardous materials.

2. Describe hiring policies. Carpentry Certification
   a. Discuss American Disabilities Act.
   b. Explore general hiring procedures.
   c. Simulate the steps in the hiring process.

3. Explain federal, state, and local building codes. Carpentry Certification
   a. Identify which code books are needed.
   b. Discuss the differences among federal, state, and local codes.
   c. Locate various topics in the code books.
   d. Explain the procedures to follow when a code violation is found.

National Standard

Carpentry Certification

Course Number and Name: **CRM 1134 Mathematics and Blueprint Interpretation**

Description: Basic instruction in mathematics and the methods of interpreting information and the relationship of details and sections to an overall blueprint utilizing scale drawings, symbols, abbreviations, floor plans, elevations, and specifications tables.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Apply the basic principles of mathematics. Construction Trades Foundation exam Standard-2
   a. Solve problems using fractions.
   b. Solve problems using decimals.
   c. Identify measuring tools.
   d. Read measuring tools.
   e. Apply basic mathematics.

2. Interpret symbols, abbreviations, alphabet of lines, types of views, and title blocks. Construction Trades Foundation Standard-5
   a. Identify the common blueprint symbols.
   b. Interpret information found in the title block of a blueprint.
   c. Interpret the meaning of various parts of a blueprint.
   d. Prepare a building layout.

National Standard

Construction Trades Foundation exam Standard-2
Construction Trades Foundation exam Standard-5

Course Number and Name: **CRM 1214 Carpentry**

Description: Basic course in carpentry skills required to perform building maintenance activities. Covers the installation methods and materials available to make repairs to building structures using accepted trade practices.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
4	2	4	90

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Demonstrate safety terms and practices.
   a. Identify safety terms.
   b. Demonstrate safety practices.
   c. Safely use the different ladders.
   d. Recognize and safely use aerial work platforms and scissor lifts.

2. Explain and apply basic building codes.

3. Identify and demonstrate the safe use of hand tools, power tools, and stationary equipment.
   a. Identify hand tools, power tools, and stationary equipment.
   b. Demonstrate the maintenance of hand tools, power tools, and stationary equipment.
   c. Demonstrate the safe use of hand tools, power tools, and stationary equipment.

4. Construct a project.
   a. Select tools and materials for a specific building task.
   b. Demonstrate procedures to use in storing materials.
   c. Lay out, cut, and assemble a specific building task.

5. Install and/or repair building components.
   a. Install and/or repair underlayment and asphalt shingles.
   b. Install and/or repair a window unit.
   c. Install and/or repair an exterior and interior door unit.
   d. Install and/or repair interior wall covering.
   e. Install and/or repair blanket insulation in walls.
   f. Install and/or repair ceiling tile.
   g. Install and/or repair various hardware.

6. Identify and use hand and power tools NCCER Carpentry Level 1 or Carpentry Certification
   a. Identify the hand tools commonly used by carpenters.
   b. Identify the power tools commonly used by carpenters.

Interpret construction drawings, specifications, and layout NCCER Carpentry Level 1 or Carpentry Certification

a. Describe the types of drawings usually included in a set of plans and describe the information found.
b. State the purpose of written specifications.
c. Identify the methods of squaring a building.

Interpret floor systems NCCER Carpentry Level 1 or Carpentry Certification

a. Read and interpret specifications and drawings to determine floor system requirements.
b. Identify the different types of framing systems.
c. Identify floor system components.
d. Describe the construction methods for floor systems, and identify floor system materials.
e. Estimate the amount of material needed for a floor assembly.

f. Identify some common alternative floor system.

Identify Building Envelope Systems NCCER Carpentry Level 1 or Carpentry Certification

a. Identify the components of the building envelope.
b. State the requirements for a proper window installation.
c. State the requirements for a proper door installation.
d. Identify the various types of locksets used on exterior doors and explain how they are installed.

Identify and describe Basic Stair Layout NCCER Carpentry Level 1 or Carpentry Certification

a. Identify the types of stairways.
b. Identify the various components associated with stairs.
c. Identify terms associated with stair framing.
d. Describe the procedure used to determine the total rise, number and size of risers, and number and size of treads required for a stairway.
e. Describe the procedure to lay out and cut stringers, risers, and treads.

Identify and describe Wall Systems NCCER Carpentry Level 1 or Carpentry Certification

a. Identify the components of a wall system.
b. Describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition Ts, bracing, and fire-stops.
c. Describe the correct procedure to assemble, erect, and brace exterior walls for a frame building.
d. Describe wall framing techniques used in masonry construction.
e. Describe the correct procedure to estimate the materials required to frame walls.
f. Identify alternative wall systems.

Identify and describe Ceiling Joist and Roof Framing NCCER Carpentry Level 1 or Carpentry Certification

a. Identify the components of ceiling framing.
b. Identify common types of roofs used in residential construction.
c. Identify the components and define the terms associated with roof framing.
d. Describe the methods used to lay out a common rafter.
e. Describe how to erect a gable roof.
f. Describe how to frame a basic gable end wall.
g. Recognize the use of trusses in basic roof framing.
h. Describe the basics of roof sheathing installation.
i. Describe how to perform a material takeoff for a roof.

National Standard

NCCER Carpentry Level 1 or Carpentry Certification

Course Number and Name: **CRM 1222** **Surface Finishes**

Description: Various techniques and processes of surface cleaning, preparation, and repair.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	0	2	30

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Discuss and apply general safety rules. Construction Trade Foundation

2. Prepare a surface. Construction Trade Foundation
   a. Identify terms associated with surface preparations.
   b. Identify and discuss the various tools used in surface preparations.
   c. Prepare a surface for refinishing.

3. Identify various surface/substrate materials and conditions. Construction Trade Foundation
   a. Identify various substrates hardware for a specific job.
   b. Identify the surface condition of substrates and coatings.
   c. Identify the basic surface preparation methods and coatings required for various substrates.

4. Finish a surface. Construction Trade Foundation
   a. Identify the necessary tools to finish various surfaces.
   b. Lay out and discuss the procedures for finishing various surfaces.

5. Describe the procedures for protecting adjacent surfaces. Construction Trade Foundation
   a. Describe the tools.
   b. Describe the methods of applying interior and exterior masking and coverings for various surfaces.
   c. Describe the procedures for complete cleanup of the area.

6. Identify and use building materials, fasteners, and adhesives NCCER Carpentry Level 1 or Construction Trade Foundation
   a. Identify various types of building materials and describe their uses.
   b. List safety precautions associated with building materials.
   c. Describe the proper method of handling and storing building materials.
   d. Explain how to calculate the quantities of lumber, panel, and concrete products using industry-standard methods.
   e. Describe the fasteners, anchors, and adhesives.

National Standard

NCCER Carpentry Level 1 or Construction Trade Foundation

Course Number and Name: **CRM 1314** **Masonry**

Description: Techniques of brick, block, and ceramic tile laying and repairing processes to include safety practices.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
4	3	2	75

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Define terms and rules for safety. Construction Trade Foundation

    a. Define terms used in the masonry trade.
    b. Explain and demonstrate rules of safety.
    c. Perform safety checks on tools and equipment.

2. Apply procedures for laying blocks and bricks. Construction Trade Foundation
    a. Identify characteristics of good brick and block laying performance.
    b. Select tools and materials for a specific task.
    c. Demonstrate the steps in mechanical and manual mixing of mortar.
    d. Perform trowel spreading and buttering.
    e. Lay a 4-in. brick lead.
    f. Lay a 4-in. return corner lead.
    g. Lay a block wall out.

3. Perform repair procedures. Construction Trade Foundation
    a. Measure, mark, and cut brick and block to specifications.
    b. Perform repairs on a brick and block wall.

4. Perform procedures for laying and repairing ceramic tile. Construction Trade Foundation
    a. Select tools and materials
    b. Explain the steps in mixing thin set.
    c. Perform trowel spreading.
    d. Lay and/or repair ceramic tile.
    e. Apply grout and finish.

National Standard

Construction Trade Foundation

Course Number and Name: **CRM 1414 Plumbing**

Description: Basic design, function, maintenance, repair, and replacement of all types of light commercial and residential plumbing fixtures.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Discuss and apply general safety rules. Construction Trade Foundation

2. Discuss terms, materials, and components. Construction Trade Foundation
   a. Define terms associated with plumbing.
   b. Identify basic materials and components used in the plumbing trade.
   c. Identify basic fixtures used in light commercial and residential structures.

3. Identify and apply basic regional and local plumbing codes. Construction Trade Foundation
   a. Describe the procedure for modifying the plumbing codes.
   b. Explain the model code and local code used in the local area.
   c. Write a proposed code change.

4. Apply basic procedures used in copper tubing. Construction Trade Foundation
   a. Select tools, materials, and equipment necessary to cut and join copper tubing by the compression, flare, and sweat methods.
   b. Cut and join copper tubing by the compression, flare, and sweat methods.

5. Apply basic procedures used in polyvinyl chloride (PVC) pipe. Construction Trade Foundation
   a. Select tools and materials used to join PVC pipe.
   b. Join PVC pipe and fittings.

6. Apply basic procedures used in steel pipe. Construction Trade Foundation
   a. Identify sizes of steel pipe.
   b. Identify the tools and materials used to join steel pipe.
   c. Identify basic plumbing fittings, bends, valves, and branches.
   d. Measure, cut, ream, thread, and assemble steel pipe and fitting.

7. Troubleshoot, repair, and/or install basic water and drainage systems and fixtures. Construction Trade Foundation
   a. Troubleshoot water systems according to local codes.
   b. Troubleshoot PVC-DWV (Drain-Waste-Vent) system according to local codes.
   c. Troubleshoot, repair, and/or install various plumbing fixtures.

National Standard

Construction Trade Foundation

Course Number and Name: **CRM 1432 Landscape Irrigation**

Description: Basic use of irrigation in residential and light commercial applications. Sprinkler designs and plans, practices, equipment, and maintenance for single-family dwellings, light commercial buildings, and apartment/townhouse complexes.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	0	4	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Identify and explain the terms and basic parts of an irrigation system.

2. Determine the layout of an irrigation system.
    a. Determine location and type of sprinkler heads needed.
    b. Determine amount of flow of water in a system.
    c. Determine size and amount of pipe for an irrigation system.

3. Perform maintenance on an irrigation system.
    a. Explain the necessary procedures in the maintenance of an irrigation system.
    b. Determine a maintenance schedule for an irrigation system.
    c. Troubleshoot and repair an irrigation system.

Course Number and Name: **CRM 1513 Electrical**

Description: Basic electrical diagnosis and repair techniques including basic circuit theory, safety and grounding essentials, wiring systems, circuitry, and electrical troubleshooting.

Hour Breakdown:

Semester Credit Hours	Lecture	Clinical	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe basic electrical safety practices. Construction Trade Foundation or Carpentry Certification
   a. Describe hazards of electrical shock.
   b. Describe accident procedures.
   c. Describe basic electrical circuit safety methods.
   d. Describe the operation of current overload devices.

2. Explain and apply basic regional and local electrical codes. Construction Trade Foundation or Carpentry Certification
   a. Explain the purpose of the National Electrical Code (NEC).
   b. Explain how to navigate the NEC.
   c. Explain Article 90 of the NEC.

3. Install electrical wiring. Construction Trade Foundation or Carpentry Certification
   a. Select tools and materials for a specific task.
   b. Install wiring for various circuits.
   c. Install boxes, cables, receptacles, and switches.
   d. Install simulated wiring circuits of various voltages from the service entrance panel to the receptacles, switches, and load centers.

4. Install and troubleshoot electrical wiring components. Construction Trade Foundation or Carpentry Certification
   a. Install a simulated residential electrical system from the weather head to the service entrance panel.

National Standard

Construction Trade Foundation or Carpentry Certification

Course Number and Name: **CRM 1613 Heating, Ventilating, and Air Conditioning (HVAC)**

Description: Basic principles, operation, maintenance, and repair of heating, ventilation, and air conditioning in residential and light commercial buildings.

Hour Breakdown:

Semester Credit Hours	Lecture	Clinical	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Safely use hand tools commonly found in the heating and air conditioning industry. Construction Trade Foundation or Carpentry Certification
   a. Define terms associated with hand tools.
   b. Describe the various types of hand tools.

2. Explain and apply basic heating and air-conditioning codes. Construction Trade Foundation or Carpentry Certification
   a. Explain the purpose and use of heating and air-conditioning codes.
   b. Explain how to navigate the heating and air-conditioning codes.
   c. Apply basic codes when performing maintenance to heating and air-conditioning systems.

3. Explain/apply the basic principles in the use of gauges. Construction Trade Foundation or Carpentry Certification
   a. Explain the safety precautions when working with charging cylinders.
   b. Explain the purposes of refrigeration gauges.
   c. Connect a set of refrigeration gauges to a system.

4. Charge a refrigeration system. Construction Trade Foundation or Carpentry Certification
   a. Identify the methods of charging a refrigeration system.
   b. Charge the refrigeration system from the low side and/or high side.

5. Provide basic recovery system service operations. Construction Trade Foundation or Carpentry Certification
   a. Describe the effect of refrigerant and fluorocarbons on the atmosphere.
   b. Identify special access fittings needed for the removal of a refrigerant from the system.
   c. Use a refrigerant recovery system to reclaim refrigerant.

6. Locate leaks in a refrigerant system. Construction Trade Foundation or Carpentry Certification
   a. Locate leaks using soap bubbles.
   b. Locate leaks using an electronic detector.
   c. Locate leaks using a halide detector.

7. Identify and perform basic maintenance repairs on a heating system. Construction Trade Foundation or Carpentry Certification
   a. Explain the functions of an electric heating system and gas furnace.
   b. Troubleshoot and provide maintenance to heating systems.

8. Explain and discuss the EPA Clean Air Act, Section 608. Construction Trade Foundation or Carpentry Certification

9. Explain basic wiring of HVAC units. Construction Trade Foundation or Carpentry Certification
   a. Demonstrate basic wiring in electric heat, gas heat, heat pump, and condenser units.
   b. Demonstrate basic wiring of control voltage.

National Standard

Construction Trade Foundation or Carpentry Certification

Course Number and Name: **CRM 1714 Special Problems in Welding**

Description: Basic course in the development of welding skills in the safe use of the oxyfuel and arc welding techniques.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
4	0	8	120

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Identify and describe the basic equipment, setup, and safety rules for proper use of oxyfuel equipment.
   a. Explain oxyfuel cutting safety.
   b. Identify and explain oxyfuel cutting equipment.
   c. Identify and explain oxyfuel flames.
   d. Identify and explain backfire and flashbacks.
   e. Set up oxyfuel equipment.
   f. Light and adjust an oxyfuel torch.
   g. Shut down oxyfuel cutting equipment.
   h. Disassemble oxyfuel equipment.

2. Perform various operations with oxyfuel equipment.
   a. Explain and demonstrate how to cut straight lines and square shapes.
   b. Explain and demonstrate how to do piercing and slot cutting.
   c. Explain and demonstrate how to lay out and cut bevels.

3. Identify and explain arc welding safety and equipment.
   a. Identify and explain safety.
   b. Identify and explain welding electrical current.
   c. Identify and explain arc welding machines.
   d. Explain setting up arc welding equipment.

4. Construct various basic welds.
   a. Weld beads on plate.
   b. Make fillet welds.
   c. Tack various metals together.

Course Number and Name: **CRM 291(1-5) Special Project in Commercial Residential Maintenance**

Description: Practical application of skills and knowledge gained in other building maintenance courses. The instructor works closely with the student to insure that the selection of a project will enhance the student's learning experience.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
1	0	2	30
2	0	4	60
3	0	6	90
4	0	8	120
5	0	10	150

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Develop a written plan and blueprints that detail the activities and projects to be completed. 21st Century Skills
   a. Utilize a written plan that details the activities and projects to be completed.
   b. Perform written occupational objectives in the special project.

2. Assess accomplishment of objectives. 21st Century Skills
   a. Prepare daily written assessment of accomplishment of objectives.
   b. Present weekly written reports to instructor in activities performed and objectives accomplished.

3. Utilize a set of written guidelines for the special project. 21st Century Skills

   a. Develop and follow a set of written guidelines for the special project.

National Standard

21st Century Skills

Course Number and Name: WBL 191(1-3), WBL 192(1-3), WBL 193(1-3), WBL 291(1-3), WBL 292(1-3), and WBL 293(1-3) Work-Based Learning I, II, III, IV, V, and VI

Description: A structured work-site learning experience in which the student, program area teacher, Work-Based Learning Coordinator, and worksite supervisor/mentor develop and implement an educational training agreement. Designed to integrate the student's academic and technical skills into a work environment. Includes regular meetings and seminars with school personnel for supplemental instruction and progress reviews. (1-3 sch: 3-9 hours externship)

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
4	2	4	90

Prerequisite: Instructor approved

Student Learning Outcomes:

1. Apply technical skills and related academic knowledge needed to be a viable member of the workforce
   a. Apply technical skills needed to be a viable member of the workforce
   b. Apply skills developed in other related courses in a work-based setting
   c. Perform tasks detailed in an educational training agreement at the work setting

2. Apply general workplace skills to include positive work habits and responsibilities necessary for successful employment
   a. Demonstrate pro-active human relationship skills in the work setting to include conflict resolution, team participation, leadership, negotiation, and customer/client service
   b. Demonstrate time, materials, and resource management skills
   c. Demonstrate critical thinking skills such as problem solving, decision making, and reasoning
   d. Demonstrate acquiring, evaluating, organizing, maintaining, interpreting, and communicating information
   e. Demonstrate positive work habits and acceptance of responsibilities necessary for successful employment

APPENDIX A: RECOMMENDED TOOLS AND EQUIPMENT

Capitalized Items

1. Cabinet, flammable materials (1)
2. Computer with operating software with multimedia kit (4 per program)
3. Mixer, cement, gas or electric powered (1)
4. Saw, masonry (14 in. with blade) (1)
5. 12 in. Dual –Bevel Compound Miter Saw
6. Saw, table (1)
7. Saw, band (14 in.) (1)
8. Welder, shielded metal arc (SMAW) or metal inert gas (MIG) (1)
9. Oxyfuel burning table with dross pan and replaceable slats (4 ft x 8 ft x 31 in.) (1)
10. A/C split (gas) (1)
11. A/C split system (410A) (1)
12. A/C window unit (1)
13. Residential package heating (Dual purpose - for heating and cooling instruction) (1)
14. Air-to-air heat pump (with electrical backup heat) (1)
15. Recovery/recycling equipment (2)
16. Velometer (Dual purpose – for heating and cooling instruction) (1)
17. Woodwork joiner 6 in. (1)
18. Track Saw
19. Surface Planner (16 in.)
20. Utility Trailer (16 ft. min.)

Other equipment items can be added when deemed appropriate by the community college industry craft committee or by industry/business training requirements.

Non-Capitalized Items

1. Air compressor (1)
2. Awl, scratch (2)
3. Bar, ripping (2)
4. Bender, copper tubing (1)
5. Bender, conduit (1/2 in. to 3/4in.) (1)
6. Bin, revolving (1)
7. Bit set, auger (1/4 in. to 1 in.) (2)
8. Bit, expansion (2)
9. Box, mortar (15 cu. ft.) (1)
10. Brace, wood hand (4)
11. Brush, masonry (6)
12. C-clamp, vise grip (4)
13. C-clamp, assorted sizes (4)
14. Chalkline (2)
15. Chisel, ripping (1)
16. Chisel set, wood (1/4 in. to 1 1/2 in.) (2)
17. Chisel set, cold (1/4 in. to 1 in.) (1)
18. Clamp, bar (4)
19. Combination Wrench Set (1/4 in. to 2 in.) (2)
20. Cutter, bolt (1)
21. Cutter, PVC pipe (2)
22. Cutter, cable (2 ft) (1)
23. Cutter, pipe (1)
24. Cutter, copper tubing (2)
25. Darby (1)

26. Die set, threader ratchet type (3/8 in. to 2 in.) (1)
27. Dividers, wing (1)
28. Drill, portable (1/2 in.) (1)
29. Drill press, (14 in. with vise) (1)
30. Drill set, spade (1/4 in. to 1 1/2 in.) (1)
31. Drill set, twist (1/16 in. to 1/2 in.) (1)
32. Drill, portable (1/2 in., right angle) (1)
33. Drill, portable (3/8 in.) (1)
34. Dust collection system for shop (1)
35. Edger, cement (2)
36. Extension cord (25 ft 12/3 conductor) (6)
37. Extinguisher, fire (ABC) (2)
38. Eye protection and sterilization chest (with 20 pairs safety glasses) (1)
39. File, metal double-cut (3)
40. File, wood (flat, assorted sizes) (6)
41. File, wood rasp (half-round) (1)
42. Flaring tool, copper tubing (2)
43. Float, rubber (2)
44. Grinder, pedestal (1)
45. Groover, cement (2)
46. Hacksaw (5)
47. Half hatchet (1)
48. Hammer, straight claw (6)
49. Hammer, sledge (3)
50. Hammer, ball peen (2)
51. Hammer, brick (4)
52. Hammer, curved claw (16 oz) (6)
53. Handsaw, rip (4)
54. Handsaw, crosscut (8)
55. Hawk, plastering (2)
56. Hoe, mortar (2)
57. Hose, water (50 ft) (2)
58. Hose, air (50 ft) (2)
59. Jointer, sled block (6)
60. Jointer, rake bricklaying (6)
61. Jointer, concave bricklaying (6)
62. Knife, putty (4 in.) (2)
63. Knife, putty (6 in.) (2)
64. Knife, putty (2 in.) (2)
65. Knife, utility (2)
66. Ladder, extension (32 ft) (1)
67. Ladder, step (4 ft) (1)
68. Ladder, step (6 ft) (1)
69. Ladder, step (8 ft) (1)
70. Level, transit with tripod and leveling rod (1)
71. Level, carpenter's aluminum (48 in.) (2)
72. Level, carpenter's aluminum (24 in.) (2)
73. Level, masonry (48 in.) (8)
74. Light, electrical circuit tester (120 V and 240 V) (6)
75. Mallet, wood (2)
76. Mallet, rubber (1)
77. Nailer, pneumatic (1)
78. Plane, jack (2)
79. Plane, block (2)

80. Pliers, channel lock (12 in.) (2)
81. Pliers, diagonal (6)
82. Pliers, lineman's (side cutters) (8)
83. Pliers, needlenose (8)
84. Pliers, joint (6)
85. Pliers, vise grip (2)
86. Plumb bob (2)
87. Pouch, electrician's tool (6)
88. Printer, laser (4 per program)
89. Reamer, pipe (1)
90. Ripper, cable (6)
91. Router, with bits (1)
92. Rule, folding (6 ft) (6)
93. Rule, folding (6 ft modular) (6)
94. Safety kit (OSHA approved) (1)
95. Sander, belt (1)
96. Sander, finish (1)
97. Sander, portable finishing (1)
98. Saw, back (2)
99. Saw, circular (7½ in. portable) (3)
100. Saw, coping (2)
101. Saw, motorized miter (1)
102. Saw, keyhole (2)
103. Saw, saber (1)
104. Saw, reciprocating (1)
105. Scaffold kit (1)
106. Screwdriver set (Phillips, assorted sizes) (10)
107. Screwdriver set (spiral w/bits) (2)
108. Screwdriver set (flat blade, assorted sizes) (10)
109. Set, nail (6)
110. Set, brick (2)
111. Sheet metal brake (1)
112. Shield, safety (5)
113. Shovel, round point (2)
114. Shovel, square point (2)
115. Snips, aviation (2)
116. Snips, tin (2)
117. Socket and ratchet set (¼ in. - 1 ½ in.) (2)
118. Solder gun (2)
119. Square, framing with rafter chart (6)
120. Square, combination (6)
121. Square, tri (6)
122. Stripper, wire (8)
123. T-bevel (2)
124. Table, workbench (4)
125. Table, metal shop (1)
126. Tamper, hand (1)
127. Tape, steel (100 ft) (2)
128. Tape, steel (16 ft) (8)
129. Tester, voltage (multimeter) (1)
130. Tong, brick (2)
131. Torch, propane (2)
132. Torch, striker (2)
133. Trowel, bricklaying (20)

134. Trowel, tuck point (1)
135. Trowel, cement finishing (2)
136. Vise, pipe stand with yoke (1)
137. Vise, pipe stand with chain (1)
138. Vise, woodworking (5 in.) (8)
139. Wheelbarrow (6 cu ft) (3)
140. Wheelbarrow, brick (1)
141. Wrench, basin (1)
142. Wrench, pipe (8 in.) (2)
143. Wrench, pipe (10 in.) (2)
144. Wrench, pipe (12 in.) (2)
145. Wrench set, combination (SAE) (1)
146. Wrench, adjustable (12 in.) (1)
147. Wrench, adjustable (10 in.) (1)
148. Wrench, pipe (14 in.) (1)
149. Wrench, adjustable (8 in.) (1)
150. Wrench, pipe (16 in.) (1)
151. Wrench, seat (1)
152. Wrench set combination (metric) (1)
153. Wrench set, sockets with ratchets and pull handles (SAE 1/4 in., 3/8 in., and 1/2 in. drives) (2)
154. Wrench set, sockets with ratchets and pull handles (metric) (2)
155. Helmet, welding (2)
156. Jacket, cape, sleeve, or apron (leather) (2)
157. Gloves, welding (2 pair)
158. Hammer, chipping (2)
159. Hammer, rotary with bits (1)
160. Grinder, pedestal with grinder wheels (1)
161. Oxyfuel gas cutting equipment with regulators, hoses, torch, tips, cart, and accessories (1 set)
162. Safety glasses with side shields and a sanitizing cabinet (2 sets)
163. Burning goggles or face shields (2)
164. #5 filter plate/lens (2)
165. Clear cover plate/lens (2)
166. Clamp-on ammeters (4)
167. Hermetic analyzer (1)
168. Capacitor analyzer (1)
169. Set of recording ammeter and voltmeter (1)
170. Electronic thermometer (1)
171. Electronic charging scale (1)
172. Micron vacuum gauge (1)
173. Manifold gauge sets (2)
174. Bimetal (digital) thermometers (2)
175. Temperature recorder (1)
176. Psychrometer (dry and wet bulb) (1)
177. Vacuum pumps (2)
178. Refrigerant identifier (1)
179. Storage tanks (3)
180. Hand oil pump (1)
181. Combustion test kit (1)
182. U-tube manometer (1)
183. Carbon monoxide tester (1)
184. Planer, 12 in. (1)
185. Construction Calculator (Master pro)-1 per student

Other equipment items can be added when deemed appropriate by the community college industry craft committee or by industry/business training requirements.

RECOMMENDED INSTRUCTIONAL AIDS

It is recommended that instructors have access to the following items:

1. Computer with operating software with multimedia kit (1)
2. Data projector (1)
3. Digital camera (1)
4. Interactive display board (1)
5. Laptop computer (1)
6. Printer/Scanner/Copier (1)
7. Projector, overhead (1)
8. DVD/Blueray

APPENDIX B: CURRICULUM DEFINITIONS AND TERMS

- Course Name – A common name that will be used by all community colleges in reporting students

- Course Abbreviation – A common abbreviation that will be used by all community and junior colleges in reporting students

- Classification – Courses may be classified as the following:
    - Career Certificate Required Course – A required course for all students completing a career certificate.
    - Technical Certificate Required Course – A required course for all students completing a technical certificate.
    - Technical Elective – Elective courses that are available for colleges to offer to students.

- Description – A short narrative that includes the major purpose(s) of the course

- Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course

- Corequisites – A listing of courses that may be taken while enrolled in the course

- Student Learning Outcomes – A listing of the student outcomes (major concepts and performances) that will enable students to demonstrate mastery of these competencies

The following guidelines were used in developing the program(s) in this document and should be considered in compiling and revising course syllabi and daily lesson plans at the local level:

- The content of the courses in this document reflects approximately 75% of the time allocated to each course. The remaining 25% of each course should be developed at the local district level and may reflect the following:
    - Additional competencies and objectives within the course related to topics not found in the state framework, including activities related to specific needs of industries in the community college district
    - Activities that develop a higher level of mastery on the existing competencies and suggested objectives
    - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed or revised
    - Activities that include integration of academic and career–technical skills and course work, school-to-work transition activities, and articulation of secondary and postsecondary career–technical programs
    - Individualized learning activities, including work-site learning activities, to better prepare individuals in the courses for their chosen occupational areas

- Sequencing of the course within a program is left to the discretion of the local college. Naturally, foundation courses related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other courses related to specific skill areas and related academics, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors. Program must include a minimum of 15 semester hours of General Education Core Courses. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester. Each community college specifies the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college.

- In order to provide flexibility within the districts, individual courses within a framework may be customized by doing the following:

- Adding new student learning outcomes to complement the existing competencies and suggested objectives in the program framework
- Revising or extending the student learning outcomes
- Adjusting the semester credit hours of a course to be up 1 hour or down 1 hour (after informing the Mississippi Community College Board [MCCB] of the change)

APPENDIX C: COURSE CROSSWALK

COURSE CROSSWALK
Commercial Residential Maintenance (CIP: 46.0401)

Note: Courses that have been added or changed in the 2021 curriculum are highlighted.

Existing			Revised		
2018 MS Curriculum Framework			**2021 MS Curriculum Framework**		
Course Number	**Course Title**	**Hours**	**Course Number**	**Course Title**	**Hours**
CRM 1113	Fundamentals of Maintenance Services	3	CRM 1113	Fundamentals of Maintenance Services	3
CRM 1122	Maintenance Regulations	2	CRM 1122	Maintenance Regulations	2
CRM 1133	Mathematics and Blueprint Interpretation	3	CRM 1133	Mathematics and Blueprint Interpretation	3
CRM 1213	Carpentry	3	CRM 1213	Carpentry	3
CRM 1222	Surface Finishes	2	CRM 1222	Surface Finishes	2
CRM 1313	Masonry	3	CRM 1313	Masonry	3
CRM 1413	Plumbing	3	CRM 1413	Plumbing	3
CRM 1432	Landscape Irrigation	3	CRM 1432	Landscape Irrigation	3
CRM 1513	Electrical	3	CRM 1513	Electrical	3
CRM 1614	Heating, Ventilating, and Air Conditioning	4	CRM 1614	Heating, Ventilating, and Air Conditioning	4
CRM 1713	Special Problem in Welding	3	CRM 1714	Special Problem in Welding	4
CRM 291(1-5)	Special Projects in CRM	1-5	CRM 291(1-5)	Special Projects in CRM	1-5

APPENDIX D: RECOMMENDED TEXTBOOK LIST

Recommended Commercial & Residential Construction Text Book List CIP: 46.0401-Commercial & Residential Construction Technology		
Book Title	**Author (s)**	**ISBN**
Commercial and Residential Maintenance Volume 1	Kasey Bridges	13 978-1-256-62208-6
Commercial and Residential Maintenance Volume 2	Kasey Bridges	13 978-1-256-62207-9

APPENDIX E: 21st Century Success Skills Standards

STANDARD 1 STUDENTS WILL UNDERSTAND AND DEMONSTRATE THE PERSONAL TRAITS THAT ENCOURAGE PRODUCTIVITY, QUALITY WORK, SELF-INITIATIVE, AND EMPLOYABILITY. APPLIES PERSONAL TRAITS TO ALL SITUATIONS. UNDERSTAND THAT THESE TRAITS MUST BE PRACTICED AND DEVELOPED.

Objective 1 Presents a positive attitude about work, learning, challenges, and about other people.

Objective 2 Is self-motivated and self-disciplined, and can work and think independently.

Objective 3 Deals honestly and with integrity in all situations

Objective 4 Is helpful and finds ways to provide value.

Objective 5 Is dependable in all situations, including regular and on-time attendance, and completing assigned tasks on-time.

Objective 6 Shows respect for others and others' time and possessions (including your coworkers and employer, and personal time vs. work time).

Objective 7 Demonstrates eagerness for self-improvement and continues to be a self-directed learner professionally and personally.

Objective 8 Is adaptable and flexible to change and setbacks.

Objective 9 Is teachable and accepts feedback.

Objective 10 Takes responsibility for own actions.

Objective 11 Works hard at any given task – has good work ethic.

Objective 12 Resourcefully produces results regardless of challenges or tedious tasks.

Objective 13 Dresses and acts appropriately for the situation.

STANDARD 2 STUDENTS WILL UNDERSTAND AND DEMONSTRATE HOW TO SEARCH FOR AND LOCATE INFORMATION FOR ANY GIVEN SUBJECT. UNDERSTAND THAT RESEARCH IS AN INTEGRAL PART OF EVERYDAY LIFE AND WORK, AND THAT EFFECTIVE RESEARCH SKILLS ENHANCE WORK AND PERSONAL LIFE.

Objective 1 Developing and asking the right questions.

1. Ask relevant and pertinent (i.e. "right") questions to focus research efforts given a specific situation.
2. Properly use interrogative questions to research the needed information (who, what, where, why, when, which, how).
3. Understand how and when to use the following questioning strategies: yes and No questions, probing questions, leading questions and rhetorical questions.

Objective 2 Information Literacy – gathering and discerning relevant information.

1. Locate and gather relevant information in printed and digital formats from various sources, including:

1. Different browsers and search engine results
2. Libraries, colleges and universities
3. Community and industry groups, associations, publications, and businesses
4. Subject matter experts

2. Differentiate between primary, secondary and tertiary sources, and understand the basic pros and cons of each source type.

3. Understand the difference between quantitative and qualitative information.

4. Discern between relevant and credible sources versus irrelevant and questionable sources.

1. Understand how and why (for what purposes) different information (messages, content, media, advertising, research, etc.) is developed and presented.
2. Recognize bias or spin within the messages presented.
3. Recognize when information becomes propaganda and how it might influence beliefs and behaviors.

Objective 3 Proper use of gathered information.

1. Understand the ethical and legal issues surrounding the access and use of information, including:

1. Basic copyright and fair use laws.
2. Difference between paraphrasing and plagiarism.
3. Provide proper citation for sources.

STANDARD 3 STUDENTS WILL UNDERSTAND HOW TO CRITICALLY THINK AND OBJECTIVELY ANALYZE AND REASON THROUGH INFORMATION USING PRIMARY AND SECONDARY SOURCES, EMPIRICAL DATA, EXPERIENCE AND COMMON SENSE.

Objective 1 Organize information for useful analysis.

1. Quickly assimilate needed and relevant data from irrelevant information.
2. Use technology as a tool to help organize and evaluate information.
3. Conceptualize and reorganize gathered information into useful forms.
4. Narrow the gathered research by categorizing it into appropriate sub-groups.

Objective 2 Apply critical thinking skills to objectively evaluate and analyze information.

1. Understand how bias and ego can affect objective reasoning.
2. Distinguish between fact and opinion, truth and error.
3. Recognize past and current trends, patterns, or cycles in research.
4. Understand and apply different reasoning methods appropriate to the situation to logically analyze and test assumptions.

1. Understand and apply cause and effect reasoning (or “if, then” logic) to study possible conclusions in various situations.
2. Understand and apply the concept of “opportunity costs” to various situations.
3. Understand and apply the “pros versus cons” methodology to reasoning in various situations.
4. Understand and apply inductive reasoning (or “generalizing”) to various situations (Inductive reasoning takes specific observable instances and creates a general rule/law from those specific instances).
5. Understand and apply deductive reasoning (or “deduction”) to various situations (Deductive reasoning takes a generally known rule/law and applies that rule to specific observable instances).

Objective 3 Applied reading and interpretation skills.

1. With minimal instruction, read, monitor, interpret, and understand information presented in various formats or tools (i.e. news articles, journal articles, charts, graphs, tables, flow charts, gauges, dials, signs, controls, etc., that may be found in various work situations.

STANDARD 4 STUDENTS WILL UNDERSTAND HOW TO EFFECTIVELY RELATE, APPLY, AND ADAPT INFORMATION AND EXPERIENCES TO ANY PERSONAL, WORKPLACE, OR EDUCATIONAL SITUATION.

Objective 1 Relate information for problem solving.

1. Clearly conceptualize, document, and communicate a problem or question to be solved.
2. Understand the true purpose and intent of solving the problem or question.
3. Consider the opinions of other people, times and places, different from one's own.
4. Relate potential solutions to different people and situations to try and understand potential effects.
5. Relate, infer, and apply the gathered research to the specific situation, problem or question

Objective 2 Use creative thinking to solve problems.

1. Develop new ideas that contribute to a given situation using various techniques, including brainstorming and "thinking outside the box".
2. Seek to understand the situation from another stakeholder's point-of-view (i.e. a customer, colleague, etc.)
3. Ask questions which challenge prevailing assumptions, including one's own assumptions and ideas.
4. Identify and ask clarifying questions that may lead to better solutions (ex. Who will do x? What will happen if x? Where will x be located? Why will x work? When could x be done? Which x works best? How will x happen?)

Objective 3 Apply fundamental works and personal mathematics.

1. Apply basic work and personal mathematics including addition, subtraction, and basic algebra to a given situation.

Objective 4 Make effective fundamental work and personal mathematics.

1. Evaluate the gathered and analyzed information, evidence, and alternative points of view.
2. Apply decision-making processes appropriate to the situation and required policies.
3. Make a decision based on achieving the desired/proper outcome.
4. Understand that every decision and action has consequences (intended or unintended).

STANDARD 5 STUDENTS WILL UNDERSTAND AND DEMONSTRATE HOW TO PRODUCE RESULTS BY DOING, RECORDING, COMMUNICATING, ACTING AND LEADING FROM INFORMATION STUDIED AND LEARNED, AND DO SO IN VERBAL AND WRITTEN COMMUNICATIONS, AND IN BOTH AND INDIVIDUAL SITUATIONS.

Objective 1 Effectively communicate with others.

1. Understand the intended/target audience, including an understanding of background, culture, environments, and demographics.
2. Understand and demonstrate positive and negative verbal and non-verbal communication.
3. Clearly and concisely communicate verbally and non-verbally in the following situations: formal/structured and impromptu speech, debate, collaborative discussion, and interview.
4. Clearly and concisely communicate in writing (using proper grammar, spelling, capitalization, word choice, etc.) using the following: resume, general letter, set of instructions, basic presentation, email, persuasive letter, business report.
5. Apply the four basic parts of writing to any written communication. The four basic parts are:

1. Basic information (title, author, contact information)
2. Introduction (quick statement of purpose and intent to entice attention)

3. Body (presentation of details related to one's intent)
4. Conclusion (focused summary of most important parts of content, including one's findings, recommendation, and/or call to action)

6. Regarding standard work-related productivity software, demonstrate competency in the basic use of, understanding the purpose for, and determining the best software for a particular job.
Focus should be given on:
1. Word processor software
2. Spreadsheets software
3. Presentation software
4. Browser software

Objective 2 Effectively interact and collaborate with others – peers, colleagues/coworkers, employer, customers
1. Work effectively and respectfully with diverse teams:
1. Value the individual contributions of each group member and be open to new and diverse perspectives.
2. Show sensitivity to cultural differences.
3. Actively participate and contribute in group discussions and assignments.
4. Proactively accept and complete assigned tasks.
5. Understand the importance of having a positive attitude while working in group situations.
6. Respectfully accept and incorporate input and feedback from others about one's own work.

2. Understand the role of active listening in effective interpersonal communication and demonstrate active listening skills.

3. Demonstrate how to appropriately deal with difficult individuals (client/customer, coworker, boss, peer) by doing the following:
1. Show empathy and understanding.
2. Do not minimize the individual's problem/concern.
3. Ensure understanding by clarifying the individual's statements using appropriate questioning and listening techniques (ask open ended questions to narrow the scope of the problem, restate what is said to verify understanding).
4. Avoid arguing with the individual while interacting with them.
5. Provide possible solutions, either in part or complete.
6. Provide ways for follow-up or next steps.

Objective 3 Effectively manage projects.
1. Set and meet S.M.A.R.T. goals, even in the face of obstacles and competing pressures.
1. Specific – focused on a specific thing
2. Measurable – can be quantified in some way
3. Achievable – can be realistically accomplished with the means and time available
4. Relevant – it will make a difference and applies appropriately to the desired outcome
5. Timely – timeframe when results should be achieved
2. Plan and prioritize tasks and work-flow to achieve desired outcomes.
3. Understand how to multi-task (managing multiple projects during the same period of time).

Objective 4 Effectively guide and lead others.
1. Expect and encourage positive personal traits and quality results from one's self and from others.
2. Be positive about others' abilities and efforts.
3. Listen to others' ideas and leverage the strengths of others to accomplish a common goal.

4. Demonstrate integrity and ethical behavior in using influence and power.
5. Proactively seek the next task to be done, and appropriately work to accomplish that task.
6. Effectively lead a meeting.
1. Provide a meeting agenda to participants
2. Start and stop on-time
3. Provide clear purpose for meeting
4. Allot sufficient time to discuss desired topics
5. Make specific assignments to specific individuals/groups
6. Record decisions and assignments for follow-up

APPENDIX F: Construction Trades Foundation Standards

STANDARD 1 STUDENTS WILL LEARN AND PRACTICE BASIC SAFETY SKILLS

Objective 1 Describe how to avoid job-site accidents.
Objective 2 Explain the relationship between housekeeping and safety.
Objective 3 Appreciate the importance of following all safety rules and company safety policies.
Objective 4 Explain the importance of reporting all on-the-job injuries, accidents, and near misses.
Objective 5 Explain the need for evacuation procedures and the importance of following them.
Objective 6 Explain their employer's substance abuse policy and how it relates to their safety.
Objective 7 Explain the term Proximity Work.
Objective 8 Recognize and explain personal protective equipment uses.
Objective 9 Inspect and care for various types of personal protective equipment.
Objective 10 Follow safe procedures for lifting heavy objects.
Objective 11 Inspect and safely work with various types of ladders and scaffolds.
Objective 12 Demonstrate an understanding of the OSHA Hazard Communication Standard.
Objective 13 Explain the function of Material Safety Data Sheets.
Objective 14 Practice fire prevention in dealing with various flammable materials.
Objective 15 Practice safe work procedures around electrical hazards.

STANDARD 2 STUDENTS WILL UNDERSTAND AND DEMONSTRATE BASIC MATH SKILLS

Objective 1 Add, subtract, multiply, and divide whole numbers, with and without a calculator.
Objective 2 Use a standard ruler to measure.
Objective 3 Add, subtract, multiply, and divide fractions.
Objective 4 Add, subtract, multiply, and divide decimals, with and without a calculator.
Objective 5 Convert decimals to percentages and percentages to decimals.
Objective 6 Convert fractions to decimals and decimals to fractions.

STANDARD 3 STUDENTS WILL RECOGNIZE AND DEMONSTRATE THE HAND TOOLS

Objective 1 Recognize basic hand tools used in the construction trade.

1. Framing hammer
2. Key hole saw
3. Sledge hammer
4. Framing square
5. Speed square
6. Nail puller/cat's paw
7. Tape measure
8. Chalk box
9. Level
10. Utility knife
11. Coping saw
12. Wood chisel
13. Nail set
14. Screwdriver set – slotted, Phillips, Allen, Torx
15. Channel lock pliers
16. Needle nose pliers
17. Linemen pliers
18. Vise grip pliers

19. T-bevel square
20. Adjustable wrench
21. Socket set
22. Tin snips
23. Hack saw
24. Crow bar
25. Combination file
26. Tool belt
27. C-clamp
28. Shovel
29. Pick
30. Finish hammer

Objective 2 Safely use these basic hand tools.

Objective 3 Have an awareness of basic maintenance procedures on these hand tools.

STANDARD 4 STUDENTS WILL RECOGNIZE AND DEMONSTRATE POWER TOOLS

Objective 1 Identify commonly used power tools of the construction trade.

1. Circular saw
2. Reciprocating saw
3. Jig saw
4. Hammer drill
5. Portable power plainer
6. Router
7. Pneumatic and power fastening tools: Framing nailer, finishing nailer, teco nailer, plastic top nailer, brad nailer, stapler
8. Miter box saw
9. Cordless drill
10. Cordless reciprocating
11. ½" drill
12. Electric tin snips
13. Powder actuated tool
14. Electric impact wrench
15. Laser builders level

Objective 2 Recognize safe use of power tools.

Objective 3 Explain the procedures to properly maintain these power tools.

STANDARD 5 STUDENTS WILL IDENTIFY AND DEMONSTRATE HOW TO READ BLUEPRINTS

Objective 1 Identify and recognize basic blueprint terms and symbols.

Objective 2 Relate information on prints to real parts and locations.

Objective 3 Identify the following:

1. Plot/site plan
2. Floor plan
3. Elevation plan
4. Foundation plan
5. Mechanical plan
6. Electrical plan
7. Specifications sheet
8. Door and window schedule

STANDARD 6 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE THE USE OF WOOD BUILDING MATERIALS, FASTENERS AND ADHESIVES

Objective 1 Explain the terms commonly used in discussing wood and lumber.

1. Crown

Objective 2 Identify various types of imperfections that are found in lumber.

1. Holes
2. Knots
3. Pitch
4. Decay

Objective 3 Identify the uses of pressure-treated lumber.

1. Landscape timbers
2. Sill plates
3. Foundations
4. Decks
5. Porches
6. Docks

Objective 4 Identify the safety precautions associated with pressure-treated lumber.

1. When cutting pressure-treated lumber, always wear eye protection and a dust mask.
2. Wash any skin that is exposed while cutting or handling the lumber.
3. Wash clothing that is exposed to sawdust separately from other clothing.
4. Do not burn pressure-treated lumber as the ash poses a health hazard.
5. Be sure to read and follow the manufacturer's safety instruction.

Objective 5 Describe the proper method of caring for lumber and wood building materials at the job site.

Objective 6 State the uses of various types of engineered lumber.

1. Headers
2. Floor joists

Objective 7 List the basic types of nails and staples and their uses.

1. Nails; common and finish
2. Chisel staples

Objective 8 Describe the common types of adhesives used in construction work and explain their uses.

STANDARD 7 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE FRAMING OF FLOORING SYSTEMS, WALL AND CEILINGS AND ROOFING SYSTEMS

Objective 1 Identify floor and sill framing and support members.

Objective 2 List and recognize different types of floor joists.

Objective 3 Demonstrate the ability to:

1. Layout and construct a floor assembly
2. Install a single floor system using tongue and groove plywood/OSB panels

Objective 4 Identify the components of a wall.

Objective 5 Layout, assemble, erect, and brace exterior walls for a frame building.

Objective 6 Understand the use and installation of roofing members.

Objective 7 Understand the members and installation of stair.

STANDARD 8 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE INSTALLATION OF WINDOWS, EXTERIOR, AND INTERIOR DOORS

Objective 1 State the requirements for a proper window installation.

Objective 2 Install a pre-hung window.

Objective 3 Install a pre-hung exterior door with weather-stripping.

Objective 4 Install a lockset.

STANDARD 9 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE DRYWALL INSTALLATION AND FINISHING

Objective 1 Select fasteners for drywall installation.

1. Nails
2. Drywall screws
3. Adhesives

Objective 2 Identify the hand tools used in drywall finishing and demonstrate the ability to use these tools.

Objective 3 Identify the materials used in drywall finishing and state the purpose and use of each type of material, including:

1. Compounds
2. Joint reinforcing tapes
3. Trim materials
4. Textures and coatings

STANDARD 10 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE INTERIOR FINISHING

Objective 1 Identify different types of interior doors.

Objective 2 List and identify specific items included on a typical door schedule.

STANDARD 11 (Optional) STUDENTS WILL GAIN AN UNDERSTANDING OF THE CONSTRUCTION INDUSTRY AS A PROFESSION AND WILL DEVELOP PROFESSIONAL SKILLS FOR THE WORKPLACE

Objective 1 As a participating member of the SkillsUSA student organization completes the SkillsUSA Level 1 Professional Development Program.

1. Complete a self-assessment inventory and identify individual learning styles.
2. Discover self-motivation techniques and establish short-term goals.
3. Determine individual time-management skills.
4. Define future occupations.
5. Define awareness of cultural diversity and equity issues.
6. Recognize the benefits of conducting a community service project.
7. Demonstrate effective communication skills with others.
8. Participate in a shadowing activity.
9. Identify components of an employment portfolio.
10. Demonstrate proficiency in program competencies.
11. Explore what is ethical in the workplace or school.
1. State the SkillsUSA motto.
2. State the SkillsUSA creed.
3. Learn the SkillsUSA colors.
4. Describe the official SkillsUSA dress.
5. Describe the procedure for becoming a SkillsUSA officer.

Objective 2 Understand the use of construction and how it relates to career opportunities.

Objective 3 Display a professional attitude toward the instructor and peers.

APPENDIX G: Carpentry Standards

STANDARD 1 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE THE USE OF WOOD BUILDING MATERIALS, FASTENERS AND ADHESIVES.

Objective 1 Identify various types of imperfections that are found in lumber.

1. Holes
2. Knots
3. Pitch
4. Decay

Objective 2 Interpret grade markings on lumber and plywood.

1. Grade designation – grade name, number, or abbreviation.
2. Species identification – indicates species individually or in combination.
3. Condition of seasoning at the time of surfacing.

Objective 3 Identify the uses of pressure-treated lumber.

1. Landscape timbers
2. Sill plates
3. Foundations
4. Decks
5. Porches

Objective 4 Identify the safety precautions associated with pressure-treated lumber.

1. When cutting pressure-treated lumber, always wear eye protection and a dust mask.
2. Wash any skin that is exposed while cutting or handling the lumber.
3. Wash clothing that is exposed to sawdust separately from other clothing.
4. Do not burn pressure-treated lumber as the ash poses a health hazard.
5. Be sure to read and follow the manufacturer's safety instruction.

Objective 5 Describe the proper method of caring for lumber and wood building materials at the job site.

Objective 6 State the uses of various types of engineered lumber.

1. Headers
2. Floor joists

Objective 7 List the basic nail and staple types and their uses.

1. Nails: Common and finish
2. Chisel staples

Objective 8 Identify the different types of anchors and their uses.

1. Anchor bolts
2. Expansion bolts
3. Earthquake straps
4. Allow something to be securely fastened to masonry or drywall.

Objective 9 Describe the common types of adhesives used in construction work and explain their uses.

1. Construction adhesives
2. Drywall adhesives
3. Contact Cement

STANDARD 2 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE THE SAFE USE OF HAND AND POWER TOOLS.

Objective 1 Identify the hand and power tools commonly used by carpenters and describe their uses.

1. Hammer, screwdrivers, pliers, chisels, levels, squares, clamps, saws.
2. Circular saw, table saw, power miter saws, reciprocating saws, portable sanders, portable drills and screw guns, pneumatic/cordless nailers and staplers, powder-actuated fastening tools.

Objective 2 Use hand tools in a safe and appropriate manner.

1. Follow all safety precautions in the manufacturer's instruction manual.
2. Always wear safety glasses and other appropriate safety equipment when working with hand and power tools.

Objective 3 State the general safety rules for operating all power tools, regardless of type.

Objective 4 State the general rules for properly maintaining all power tools, regardless of type.

Objective 5 Identify the portable power tools commonly used by carpenters and describe the appropriate and safe manner of using them.

STANDARD 3 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE THE USES OF CONCRETE AND REINFORCING MATERIALS.

Objective 1 Perform volume quantities and estimates for concrete quantity requirements.

1. Calculate cubic yards.

Objective 2 Identify types of concrete reinforcement bars and describe their uses.

1. Rebar
2. Wire mesh

Objective 3 Recognize four kinds of footings:

1. Continuous or spread
2. Stepped
3. Pier
4. Spot

Objective 4 Recognize types of concrete pours that require the construction of edge forms:

1. Slabs with or without a foundation
2. Driveways
3. Sidewalks
4. Approaches

Objective 5 Identify the parts of edge forms and explain their purpose.

Objective 6 Explain the purpose of a screed and identify the different types of screeds.

Objective 7 Demonstrate the ability to set screeds on grade.

Objective 8 Identify the various types of concrete forms.

Objective 9 Identify the components of each type of form.

Objective 10 Explain the safety procedures associated with using concrete forms.

Objective 11 Erect, plumb, and brace selected concrete forms, including:
1. Basic wall form with walers and strongbacks
2. Ganged wall form
3. Radius wall form
4. Column form
5. Stair form

STANDARD 4 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE FRAMING OF FLOORING SYSTEMS, WALL AND CEILING AND ROOFING SYSTEMS.

Objective 1 Read and understand drawings and specifications to determine floor system requirements.

Objective 2 Identify floor and sill framing and support members.

Objective 3 Name the methods used to fasten sills to the foundation.

Objective 4 List and recognize different types of floor joists.

Objective 5 List and recognize different types of flooring materials.

Objective 6 Explain the purposes of subflooring.

Objective 7 Match selected fasteners used in floor framing to their correct uses.

Objective 8 Demonstrate the ability to:
1. Layout and construct a floor assembly
2. Install a single floor system using tongue and groove plywood/OSB panels

Objective 9 Identify the components of a wall.

Objective 10 Describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition T's, bracing, and firestops.

Objective 11 Describe the common materials and methods used for installing sheathing on walls.

Objective 12 Layout, assemble, erect, and brace exterior walls for a frame building.

Objective 13 Understand the terms associated with roof framing.

Objective 14 Identify the roof framing members used in gable and hip roofs.

Objective 15 Identify the various types of trusses used in roof framing.

Objective 16 Use the rafter framing square, speed square, and calculator in laying out a roof.

Objective 17 Identify various types of sheathing used in roof construction.

Objective 18 Erect a gable roof using trusses.

Objective 19 Understand the use and installation of roofing members.

Objective 20 Understand the members and installation of stairs.

STANDARD 5 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE INSTALLATION OF WINDOWS AND EXTERIOR DOORS.

Objective 1 Identify various types of fixed, sliding, and swinging windows.

Objective 2 Identify the steps of a window installation.

1. Ensure that the window is closed
2. Remove shipping blocks
3. Install window in rough opening
4. Shim as necessary
5. Check sill for level
6. Plumb the side jambs
7. Recheck for level and plumb
8. Nail
9. Install insulation

Objective 3 Install a window.

Objective 4 Identify the common types of exterior doors.

Objective 5 Identify the threshold.

Objective 6 Install a pre-hung exterior door with weather-stripping.

Objective 7 Identify the various types of locksets used on exterior doors and explain how they are installed.

Objective 8 Install a lockset.

STANDARD 6 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE INSTALLATION OF ROOFING MATERIALS.

Objective 1 Identify roofing terms.

1. Square
2. Coverage
3. Exposure
4. Rake
5. Underlayment
6. Flashing
7. Weather guard
8. Vents
9. Gutters

Objective 2 Identify different roofing materials.

1. Asphalt – standard and metric

2. Cedar
3. Tile
4. Metal

STANDARD 7 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE INSTALLATION OF INSULATION MATERIALS.

Objective 1 Identify the types of installation.
1. Flexible – Fiberglass blankets
2. Loose fill – Blown
3. Rigid – Sheet or board form
4. Reflective – Aluminum foil bonded

Objective 2 Explain terms related to insulation.
1. R-value
2. Vapor barrier

STANDARD 8 STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE DRYWALL INSTALLATION AND FINISHING.

Objective 1 Identify the different types of gypsum wallboard (drywall) and their uses.

Objective 2 Select the type of thickness of drywall required for specific installations.

Objective 3 Select fasteners for drywall installation.
1. Nails
2. Drywall screws
3. Adhesives

Objective 4 Explain the fastener schedules for different types of drywall installations.

Objective 5 Perform single-layer and multi-layer drywall installations using different types of fastening systems.
1. Nails
2. Screws

Objective 6 Identify the hand tools used in drywall finishing and demonstrate the ability to use these tools.

Objective 7 Identify the automatic tools used in drywall finishing.

Objective 8
Identify the materials used in drywall finishing and state the purpose and use of each type of material, including:
1. Compounds
2. Joint reinforcing tapes

3. Trim materials
4. Textures and coatings

STANDARD 9 (Optional) STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE INTERIOR FINISHING.

Objective 1 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.

Objective 2 Identify different swings of interior doors.

Objective 3 Demonstrate the procedure for placing and hanging a selected door.

Objective 4 Identify the different types of standard moldings and describe their uses.

Objective 5 Make square and miter cuts using a miter saw.

Objective 6 Make coped joint cuts using a coping saw.

Objective 7 Install interior trim, including:
1. Door trim
2. Window trim
3. Base trim
4. Ceiling trim

STANDARD 10 (Optional) STUDENTS WILL GAIN AN UNDERSTANDING OF BUILDING TRADES AS A PROFESSION AND WILL DEVELOP PROFESSIONAL SKILLS FOR THE WORKPLACE.

Objective 1 As a participating member of the SkillsUSA student organization complete the SkillsUSA Level 1 Professional Development Program.
1. Complete a self-assessment inventory and identify individual learning styles.
2. Discover self-motivation techniques and establish short-term goals.
3. Determine individual time-management skills.
4. Define future occupations.
5. Define awareness of cultural diversity and equity issues.
6. Recognize the benefits of conducting a community service project.
7. Demonstrate effective communication skills with others.
8. Participate in a shadowing activity.
9. Identify components of an employment portfolio.
10. Explore what is ethical in the workplace or school.
11. Demonstrate proficiency in program competencies.
12. Master a working knowledge of SkillsUSA.
1. State the SkillsUSA motto.
2. State the SkillsUSA creed.
3. Learn the SkillsUSA colors.
4. Describe the official SkillsUSA dress.
5. Describe the procedure for becoming a SkillsUSA officer.

Objective 2 Understand the career opportunities as they relate to this field of study.

Objective 3 Display a professional attitude toward the instructor and peers.
* SkillsUSA PDP requirements - recommended