

BUILDING CONSTRUCTION CLUSTER 1, 2, 3, 4
(New Name: CONSTRUCTION TECHNOLOGY 1-4 2021-22)
COURSE CODES: 6060, 6061, 6062, 6063

PROGRAM DESCRIPTION: The Construction Technology program offers students practical training in the entire range of residential and light commercial building techniques including estimating building costs, carpentry, cabinetmaking, residential wiring, blueprint reading, brick masonry, construction, building codes, and safety. Classroom knowledge is enhanced through multiple hands-on projects. Successful completion of program curriculum will provide students with the opportunity to become eligible for industry-recognized credentials and certifications.

If a student takes Introduction to Construction (Core curriculum) and scores 70% on all assessments, the student does not have to repeat these modules in Air Conditioning and Refrigeration Technology, Building Construction, Cabinetmaking, Carpentry, Electricity, Masonry, Mechatronics, Plumbing, and Welding.

OBJECTIVE: Given the necessary equipment, supplies, and facilities, the student will complete all of the following core standards successfully.

CREDIT: 1 (120 hours), 2 (240 hours) per course code

RECOMMENDED PREREQUISITE: Algebra 1

RECOMMENDED GRADE LEVEL: 9 - 12

COMPUTER ACCESS REQUIRED: 1 Computer per student with Internet access

RECOMMENDED MAXIMUM ENROLLMENT: 16

RESOURCES: [Instructional Materials](#)

A. STUDENT ORGANIZATIONS

Effective professionals know the academic subject matter, including professional development, required for proficiency within their area. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Identify the purpose and goals of a Career and Technology Student Organization (CTSO).
2. Explain how CTOS are integral parts of specific clusters, majors, and/or courses.
3. Explain the benefits and responsibilities of being a member of a CTOS.
4. List leadership opportunities that are available to students through participation in CTOS conferences, competitions, community service, philanthropy, and other activities.

5. Explain how participation in CTSOs can promote lifelong benefits in other professional and civic organizations.

B. TECHNOLOGY KNOWLEDGE

Effective professionals know the academic subject matter, including the ethical use of technology as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate proficiency and skills associated with the use of technologies that are common to a specific occupation.
2. Identify proper netiquette when using e-mail, social media, and other technologies for communication purposes.
3. Identify potential abuse and unethical uses of laptops, tablets, computers, and/or networks.
4. Explain the consequences of social, illegal, and unethical uses of technology (e.g., piracy; cyberbullying, illegal downloading; licensing infringement; inappropriate uses of software, hardware, and mobile devices in the work environment).
5. Discuss legal issues and the terms of use related to copyright laws, fair use laws, and ethics pertaining to downloading of images, photographs, documents, video, sounds, music, trademarks, Creative Commons, and other elements for personal use.
6. Describe ethical and legal practices of safeguarding the confidentiality of business-related information.
7. Describe possible threats to a laptop, tablet, computer, and/or network and methods of avoiding attacks.

C. PERSONAL QUALITIES AND EMPLOYABILITY SKILLS

Effective professionals know the academic subject matter, including positive work practices and interpersonal skills, as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate punctuality.
2. Demonstrate self-representation.
3. Demonstrate work ethic.
4. Demonstrate respect.
5. Demonstrate time management.
6. Demonstrate integrity.
7. Demonstrate leadership.
8. Demonstrate teamwork and collaboration.
9. Demonstrate conflict resolution.
10. Demonstrate perseverance.
11. Demonstrate commitment.
12. Demonstrate a healthy view of competition.
13. Demonstrate a global perspective.
14. Demonstrate health and fitness.
15. Demonstrate self-direction.
16. Demonstrate lifelong learning.

D. PROFESSIONAL KNOWLEDGE

Effective professionals know the academic subject matter, including positive work practices and interpersonal skills, as needed in their role. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate effective speaking and listening skills.
2. Demonstrate effective reading and writing skills.
3. Demonstrate mathematical reasoning.
4. Demonstrate job-specific mathematics skills.
5. Demonstrate critical-thinking and problem-solving skills.
6. Demonstrate creativity and resourcefulness.
7. Demonstrate an understanding of business ethics.
8. Demonstrate confidentiality.
9. Demonstrate an understanding of workplace structures, organizations, systems, and climates.
10. Demonstrate diversity awareness.
11. Demonstrate job acquisition and advancement skills.
12. Demonstrate task management skills.
13. Demonstrate customer-service skills.

BUILDING CONSTRUCTION 1 (CONSTRUCTION TECHNOLOGY) (120 HOURS)

NCCER® CORE MODULES

MODULE E. SAFETY

Proficient construction professionals demonstrate basic safety knowledge as needed in their role. The following accountability criteria are considered essential for students in all the Construction programs of study.

1. Identify the responsibilities and personal characteristics of a professional craftsperson.
2. Describe the safe work requirements for elevated work.
3. Identify and explain how to avoid struck-by and caught-in-between hazards.
4. Explain the appropriate safety precautions around common job-site hazards.
5. Demonstrate the use and care of appropriate personal protective equipment (PPE).
6. Identify and describe other specific job-site safety hazards.
7. Follow safe procedures for lifting heavy objects.
8. Describe safe behavior on and around ladders and scaffolds.
9. Explain the importance of the Hazard Communication Standard (HazCom) requirement and Safety Data Sheets (SDS)
10. Describe fire prevention and firefighting techniques.
11. Define safe work procedures around electrical hazards.
12. Complete 10-hour OSHA course/assessment and receive card. (Optional)
13. Complete Performance Tasks

MODULE F. CONSTRUCTION MATH

Proficient construction professionals demonstrate basic math skills as needed in their role. The following accountability criteria are considered essential for students in all the Construction programs of study.

1. Add, subtract, multiply, and divide whole numbers, with and without a calculator.
2. Use a standard ruler and a metric ruler 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 percent and percent 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.

MODULE G. INTRODUCTION TO HAND TOOLS

Proficient construction professionals demonstrate how to safely use various hand tools as needed in their role. The following accountability criteria are considered essential for students in all the Construction programs of study.

1. Recognize and identify various types of basic hand tools used in the construction trade.
2. Identify and describe how to use various types of measurement and layout tools.
3. Identify and explain how to use various types of cutting and shaping tools.
4. Use these tools safely.
5. Describe the basic procedures for taking care of these tools.
6. Complete Performance Tasks

MODULE H. INTRODUCTION TO POWER TOOLS

Proficient construction professionals demonstrate how to safely use power tools as needed in their role. The following accountability criteria are considered essential for students in all the Construction programs of study.

1. Identify and explain how to use various types of power drills and impact wrenches used in the construction trade.
2. Identify and explain how to use various types of power saws.
3. Identify and explain how to use various grinders and grinder attachments.
4. Identify and explain how to use miscellaneous power tools.
5. Use power tools safely.
6. Explain how to maintain power tools properly.
7. Complete Performance Tasks

MODULE I. INTRODUCTION TO CONSTRUCTION DRAWINGS/RECOMMEND BLUEPRINT READING

Proficient construction professionals demonstrate knowledge and the use of blueprints/construction drawings as needed in their role. The following accountability criteria are considered essential for students in all of the Construction programs of study.

1. Identify and describe various types of construction drawings, including their fundamental components and features.
2. Recognize and identify basic blueprint terms, components, and symbols.
3. Relate information on blueprints to actual locations on the print.
4. Recognize different classifications of drawings.
5. Interpret and use drawing dimensions.
6. Complete Performance Tasks

MODULE J. BASIC RIGGING (OPTIONAL)

Proficient construction professionals demonstrate how to use basic rigging as needed in their role. The following accountability criteria are considered essential for students in all of the Construction programs of study.

1. Explain how ropes, chains, hoists, loaders, and cranes are used to move material and equipment from one location to another on a job site.
2. Describe inspection techniques and load-handling safety practices.
3. Explain the American National Standards Institute (ANSI) hand signals.
4. Complete Performance Tasks

MODULE K. BASIC COMMUNICATION SKILLS (SDE Requirement)

Proficient construction professionals demonstrate appropriate communication skills as needed in their role. The following accountability criteria are considered essential for students in all of the Construction programs of study.

1. Describe the communication, listening and speaking processes and their relationship to job performance.
2. Describe good reading and writing skills and their relationship to job performance
3. Demonstrate telephone and e-communication skills necessary in the workplace.
4. Complete Performance Tasks.

MODULE L. BASIC EMPLOYABILITY SKILLS (SDE Requirement)

Proficient construction professionals demonstrate appropriate workplace behavior as needed in their role. The following accountability criteria are considered essential for students in all of the Construction programs of study.

1. Describe the opportunities in the construction business and how an individual enters the construction workforce.

2. Explain the importance of critical thinking and how to solve problems in the workplace.
3. Explain the importance of social skills and identify ways good social skills are applied in the construction trade.
4. Describe computer systems and their industry applications.
5. Explain interpersonal relationship skills, self-presentation, and key workplace issues such as sexual harassment, stress, and substance abuse.

MODULE M. MATERIALS HANDLING

Proficient construction professionals demonstrate appropriate skills handling materials as needed in their role. The following accountability criteria are considered essential for students in all of the Construction programs of study.

1. Describe the hazards associated with handling materials and provides techniques to avoid both injury and property damage.

CONSTRUCTION TECHNOLOGY 2 - 4

F. INTRODUCTION TO MASONRY

Proficient construction professionals demonstrate basic knowledge in use of masonry materials, tools, techniques, safety precautions as needed in their role. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Describe modern masonry materials and techniques.
2. Recognize the basic safety precautions when working with masonry materials.
3. Explain how to mix mortar and lay masonry units.
4. Describe the skills, attitudes, and abilities needed to be a successful mason.
5. Perform performance tasks.

G. MASONRY UNIT AND INSTALLATION TECHNIQUES

Proficient construction professionals demonstrate basic knowledge in installing block and brick as needed in their role. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Describe how to install concrete masonry units.
2. Describe how to install brick.
3. Describe how to cut concrete masonry unit and brick.
4. Describe how to install masonry reinforcement and accessories.
5. Perform performance tasks.

H. FLOOR SYSTEMS

Proficient construction professionals demonstrate basic knowledge in reading and interpreting plans, and framing and installing various floor systems. The following

accountability criteria are considered essential for students in the Construction Technology program of study.

1. Read and interpret specifications and drawings to determine floor system requirements.
2. Identify the different types of framing systems.
3. Identify floor system components.
4. Describe the construction methods for floor systems, and identify floor system materials.
5. Estimate the amount of material needed for a floor assembly.
6. Identify some common alternative floor systems.
7. Perform performance tasks.

I. CEILING AND ROOF FRAMING

Proficient construction professionals demonstrate basic knowledge in residential ceiling and roof framing. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Identify the components of ceiling framing.
2. Identify common types of roofs used in residential construction.
3. Identify the components and define the terms associated with roof framing.
4. Describe the methods used to lay out a common rafter.
5. Describe how to erect a gable roof.
6. Describe how to frame a basic gable end wall.
7. Identify the use of various trusses in basic roof framing.
8. Describe the basics of roof sheathing installation.
9. Describe how to perform a material takeoff for a roof.
10. Perform performance tasks.

J. ROOFING APPLICATIONS

Proficient construction professionals demonstrate appropriate skills and knowledge in residential and commercial roofing applications. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Explain the safety requirements for roofing projects.
2. Identify the tools and fasteners used in roofing.
3. Identify the different roofing systems and their associated materials.
4. Describe the installation techniques for common roofing systems.
5. Describe the estimating procedure for roofing projects.
6. Perform performance tasks.

K. WALL SYSTEMS

Proficient construction professionals demonstrate appropriate skills and knowledge in laying out, constructing, and estimating wall systems. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Identify the components of a wall system.
2. Describe the procedure for laying out a wood frame wall, including plats, corner posts, door and window openings, partition Ts, bracing, and fire-stops.
3. Describe the correct procedure to assemble, erect, and brace exterior walls for a frame building.
4. Describe wall framing techniques used in masonry construction.
5. Describe the correct procedure to estimate the materials required to frame walls.
6. Identify alternative wall systems.
7. Perform performance tasks.

L. EXTERIOR FINISHING

Proficient construction professionals demonstrate appropriate skills and knowledge in installing and finishing exterior walls. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Describe the safety hazards when working with exterior finish materials.
2. Describe the various types and applications of exterior finish materials.
3. Explain how to install exterior finish materials.
4. Describe the estimating procedure for exterior finish projects.
5. Perform performance tasks.

M. BASIC STAIR LAYOUT

Proficient construction professionals demonstrate appropriate skills and knowledge for framing and installing stairs. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Identify the types of stairways.
2. Identify the various components associated with stairs.
3. Identify terms associated with stair framing.
4. Describe the procedure used to determine the total rise, number and size of risers, and number and size of treads required for a stairway.
5. Describe the procedure to lay out and cut stringers, risers, and treads.
6. Perform performance tasks.

N. ELECTRICAL SAFETY (OPTIONAL)

Proficient construction professionals demonstrate appropriate knowledge in electrical safety. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Identify safe working practices in the construction environment.
2. Explain the purpose of OSHA and how it promotes safety on the job.
3. Identify electrical hazards and how to avoid or minimize them in the workplace.
4. Explain electrical safety issues concerning lockout/tagout procedures, confined space entry, respiratory protection, and fall protection systems.
5. Develop a task plan and a hazard assessment for a given task and select the appropriate

- PPE and work methods to safely perform the task.
6. Perform performance tasks.

O. RESIDENTIAL ELECTRICAL SERVICES

Proficient construction professionals demonstrate appropriate skills and knowledge of residential wiring per the guidelines of the *National Electrical Code*. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Explain the role of the *National Electrical Code* in residential wiring and describe how to determine electric service requirements for dwellings.
2. Explain the grounding requirements of a residential electric service.
3. Calculate and select service-entrance equipment.
4. Install lighting circuits to be switched from one or more locations.
5. Compute branch circuit loads and explain their installation requirements.
6. Explain the types of purposes of equipment grounding conductors.
7. Explain the purpose of ground fault circuit interrupters and tell where they must be installed.
8. Size outlet boxes and select the proper type for different wiring methods.
9. Describe rules for installing electric space heating and HVAC equipment.
10. Describe the installation rules for electrical systems around swimming pools, spas, and hot tubs.
11. Explain how wiring devices are selected and installed.
12. Describe the installation and control of lighting fixtures.
13. Demonstrate the ability to reference the codebook.
14. Perform performance tasks.

P. INTRODUCTION TO DRAIN, WASTE, AND VENT (DWW) SYSTEMS

Proficient construction professionals demonstrate appropriate skills and knowledge for installing drain, waste, and vent systems. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Explain how waste moves from a fixture through the drain system to the environment.
2. Identify the major components of a drainage system and describe their functions.
3. Identify the different types of traps and their components, explain the importance of traps, and identify the ways that traps can lose their seals.
4. Identify significant code and health issues, violations, and consequences related to DWV systems.
5. Perform performance tasks.

Q. PLASTIC PIPE AND FITTINGS

Proficient construction professionals demonstrate appropriate skills and knowledge for installing various plastic pipe and fittings. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Identify the various types of plastic pipe.
2. Identify the material properties, storage, and handling requirements of plastic pipe.
3. Identify the types of fittings and valves used with plastic pipe.
4. Identify the techniques used in hanging and supporting plastic pipe.
5. Properly measure, cut, and join plastic pipe.
6. Identify the hazards and safety precautions associated with plastic pipe.
7. Perform performance tasks.

R. COPPER TUBE AND FITTINGS

Proficient construction professionals demonstrate appropriate skills and knowledge for installing copper tubing and fittings. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Identify the various types of copper tube.
2. Identify the material properties, storage, and handling requirements of copper tube.
3. Identify the types of fittings and valves used with copper tube.
4. Identify the techniques used in hanging and supporting copper tube.
5. Properly measure, cut, and join copper tube.
6. Identify the hazards and safety precautions associated with copper tube.
7. Perform performance tasks.

S. CABINETMAKING

Proficient construction professionals demonstrate appropriate skills and knowledge for building cabinets and countertops. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Identify and describe the types of wood commonly used to construct cabinets.
2. Identify and describe the safe use of various cabinetmaking power tools.
3. Identify and describe joints and other construction features of cabinet components and their related hardware and fasteners.
4. Describe how to assemble, sand, and finish cabinets.
5. Describe how to prepare and apply laminate to a countertop.
6. Perform performance tasks.

T. CABINET INSTALLATION

Proficient construction professionals demonstrate appropriate skills and knowledge for building and installing cabinets and countertops. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. Describe the safety hazards when installing cabinets.
2. Identify the different types of cabinets.
3. Identify cabinet components and hardware and describe their purpose.
4. Explain how to lay out and install a basic set of cabinets.
5. Perform performance tasks.

U. INTRODUCTION TO CONSTRUCTION EQUIPMENT

Proficient construction professionals recognize and identify appropriate safety precautions and operations of construction equipment. The following accountability criteria are considered essential for students in the Construction Technology program of study.

1. State the safety precautions associated with construction equipment.
2. Identify and explain the safe operation and use of various pieces of construction equipment.
3. Perform performance tasks.

[Course Materials and Resources](#)

[Academic Standards and Indicators](#)