



Montgomery County
CONSTRUCTION TRADES FOUNDATION

Masonry

The Montgomery County Students Construction Trades Foundation, Inc has developed a comprehensive construction technology program designed to prepare students for a rewarding career in the construction industry. Students master a variety of construction skills by applying knowledge through their participation in a “student design-built” house project. In addition, each program area has articulation agreements with an apprenticeship program as well as Montgomery College.

The apprenticeship program is aligned with the National Center for Construction Education and Research (NCCER) standards. The NCCER is a not-for-profit education foundation created to help address the critical workforce shortage facing the construction industry and to develop industry driven standardized craft training program with portable credentials. For each module, students must score a minimum of 70% on module tests and complete 100% of the Competency Profiles in order to receive NCCER credit. Parentheses indicate the approximate classroom hours spent on each module. Students who enroll in the construction program beyond 2 semesters may have an opportunity to complete optional modules in Level 2 of the NCCER curriculum.

For students who earn a B grade or better, up to three credits may be transferred to Montgomery College’s Building Trades Technology, A.A.S. or Building Trades Technology Certificate Programs.

The following describes the scope and sequence of instruction for Masonry.

NCCER Modules-Semester 1	Unit(s)
Module 28101-04	Introduction to Masonry (20 hours)
Module 28102-04	Masonry Tools and Equipment (12.5 hours)
Module 28104-04	Mortar (10 hours)

NCCER Modules-Semester 2	Unit(s)
Module 28103-04	Measurements, Drawings, and Specifications (10 hours)
Module 28104-04	Masonry Units and Installation Techniques (60 hours)

NCCER Modules-Semester 3 (Optional)	Unit(s)
Module 28201-05	Residential Plans and Drawing Interpretation (12.5 hours)
Module 28202-05	Residential Masonry (25 hours)
Module 28203-05	Grout and Other Reinforcement (15 hours)
Module 02206-05	Metal Work in Masonry (15 hours)

NCCER Modules-Semester 4 (Optional)	Unit(s)
Module 28205-05	Advanced Laying Techniques (50 hours)
Module 28206-05	Construction Techniques and Moisture Control (20 hours)
Module 28207-05	Construction Inspection and Quality Control (15 hours)

LEVEL 1

MODULE 28101-04 INTRODUCTION TO MASONRY

1. Discuss the history of masonry.
2. Describe modern masonry materials and methods.
3. Explain career ladders and advancement possibilities in masonry work.
4. Describe the skills, attitudes, and abilities needed to work as a mason.
5. State the safety precautions that must be practiced at a work site, including the following:
 - Safety practices
 - Fall-protection procedures
 - Forklift-safety operations
6. Perform the following basic bricklaying procedures:
 - Mixing of mortar
 - Laying a mortar bed
 - Laying bricks
7. Put on eye protection, respiratory protection, and a safety harness.
8. Use the correct procedures for fueling and starting a gasoline-powered tool.

MODULE 28102-04 MASONRY TOOLS AND EQUIPMENT

1. Identify and name the tools used in performing masonry work.
2. Identify and name the equipment used in performing masonry work.
3. Describe how each tool is used.
4. Describe how the equipment is used.
5. Associate trade terms with the appropriate tools and equipment.
6. Demonstrate the correct procedures for assembling and disassembling scaffolding according to federal safety regulations, under the supervision of a competent person.

MODULE 28103-04 MEASUREMENTS, DRAWINGS, AND SPECIFICATIONS

1. Work with denominate numbers.
2. Read a mason's measure.
3. Convert measurements in the U.S. Customary (English) system into their metric equivalents.
4. Recognize, identify, and calculate areas, circumferences, and volumes of basic geometric shapes.
5. Identify the basic parts of a set of drawings.
6. Discuss the different types of specifications used in the building industry and the sections that pertain to masonry.

MODULE 28104-04 MORTAR

1. Name and describe the primary ingredients in mortar and their properties.
2. Identify the various types of mortar used in masonry work.
3. Describe the common admixtures and their uses.
4. Identify the common problems found in mortar application and their solutions.

5. Properly set up the mortar mixing area.
6. Properly mix mortar by hand.
7. Properly mix mortar with a mechanical mixer.

MODULE 28105-04 MASONRY UNITS AND INSTALLATION TECHNIQUES

1. Describe the most common types of masonry units.
2. Describe and demonstrate how to set up a wall.
3. Lay a dry bond.
4. Spread and furrow a bed joint, and butter masonry units.
5. Describe the different types of masonry bonds.
6. Cut brick and block accurately.
7. Lay masonry units in a true course.

LEVEL 2

MODULE 28201-045 RESIDENTIAL PLANS AND DRAWING INTERPRETATION

1. Understand the organization of residential plans and drawings.
2. Interpret dimensions and scales on drawings.
3. Interpret information on residential plans.
4. Estimate materials quantities from plans and drawings.

MODULE 28202-05 RESIDENTIAL MASONRY

1. Understand the requirements for construction of various types of residential foundations.
2. Identify and explain the characteristics, uses, and installation techniques for brick pavers.
3. Lay out and construct steps, patios, and decks made from masonry units.
4. Lay out and construct chimneys and fireplaces.

MODULE 28203-05 GROUT AND OTHER REINFORCEMENT

1. Name and describe the primary ingredients in grout and their properties.
2. Identify the different types of grout used in masonry work.
3. Describe the common admixtures and their uses.
4. Describe the use of steel bar reinforcement in masonry construction.
5. Use the proper techniques to apply grout in low and high lifts.

MODULE 28204-05 METAL WORK IN MASONRY

1. Describe the uses and installation of vertical reinforcement.
2. Describe the uses and installation of different types of horizontal joint reinforcements and ties.
3. Describe the uses and installation of different anchors, fasteners, and embedded items.
4. Describe the installation of hollow metal frames.
5. Describe the functions and installations of sills and lintels.

MODULE 28205-05**ADVANCED LAYING TECHNIQUES**

1. Recognize the structural principles and fundamental uses of basic types of walls.
2. Recognize the requirement for, and function of, control joints and expansion joints.
3. Construct various types of walls using proper reinforcement, jointing, and bonding techniques.
4. Construct specialty structures such as manholes, segmented block walls, and screens.
5. Identify and explain the different types of masonry arches used today.
6. Construct a semicircular and jack arch.

MODULE 28206-05
CONTROL**CONSTRUCTION TECHNIQUES AND MOISTURE**

1. Explain and demonstrate techniques for constructing masonry around windows, doors, and other openings.
2. Explain the requirements for wall bracing and demonstrate the techniques used to construct pilasters and other types of bracing.
3. Identify the various types of insulation used in conjunction with masonry construction and explain installation techniques.
4. Identify the need for moisture control in various types of masonry construction and demonstrate the techniques used to eliminate moisture problems.

MODULE 28207-05**ELEVATED WORK**

1. Describe the appropriate steps necessary for setting up and maintaining elevated workstations.
2. Properly operate material handling and hoisting equipment.
3. Describe the safety requirements and guidelines employed in elevated and high-rise construction.
4. Describe basic activities that can be used on the job to prevent elevated workstation accidents.
5. Understand scaffolding positioning and how it affects laying technique.

MODULE 28208-05**CONSTRUCTION INSPECTION AND QUALITY CONTROL**

1. Discuss industry standards for quality control.
2. Build masonry sample panels and prisms.
3. Perform field tests on mortar.
4. Discuss and perform field inspections.