



Montgomery County  
**CONSTRUCTION TRADES FOUNDATION**

### **Foundations of Building and Construction Technology**

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.

Foundations of Building and Construction Technology is a one semester class designed for students new to the construction trades. The Core Curriculum is taught within the class and is the bases for all construction skills. For each module, students must score a minimum of 70% on module tests and complete 100% of the Competency Profile in order to receive NCCER credit. Parentheses indicate the approximate classroom hours spent on each module. Hands-On Experiences provides knowledge and skill development activities in each of the trade areas: Carpentry, Masonry, Construction Electricity, Plumbing, and HVAC. Upon completion of this class, students will chose a construction program to focus their remaining training.

For students who earn a B grade or better, up to seven 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 Foundations of Building and Construction Technology.

<b>NCCER Modules</b>	<b>Unit(s)</b>
<b>Module 00101-09</b>	Basic Safety (12.5 hours)
<b>Module 00103-09</b>	Introduction to Hand Tools (10 hours)
<b>Module 00104-09</b>	Introduction to Power Tools (10 hours)
<b>Module 00105-09</b>	Introduction to Construction Drawings (10 hours)
<b>Module 00106-09</b>	Basic Rigging (15 elective hours)
<b>Module 00107-09</b>	Basic Communication Skills (7.5 elective hours)
<b>Module 00108-09</b>	Basic Employability Skills (7.5 elective hours)
<b>Module 00109-09</b>	Introduction to Materials Handling (5 hours)
<b>Module 00102-09</b>	Introduction to Construction Math (10 hours)
	Hands-On Experiences (100 hours)

## **CORE CURRICULUM**

### **MODULE 00101-09**

### **BASIC SAFETY**

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.

### **MODULE 00103-04**

### **INTRODUCTION TO HAND TOOLS**

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

### **MODULE 00104-09**

### **INTRODUCTION TO POWER TOOLS**

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

### **MODULE 00105-09**

### **INTRODUCTION TO CONSTRUCTION DRAWINGS**

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

### **MODULE 00106-09**

### **BASIC RIGGING**

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.

#### **MODULE 00107-09**

#### **BASIC COMMUNICATION SKILLS**

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

#### **MODULE 00108-09**

#### **BASIC EMPLOYABILITY SKILLS**

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

#### **MODULE 00109-09**

#### **INTRODUCTION TO MATERIALS HANDLING**

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.

#### **MODULE 00102-09**

#### **INTRODUCTION TO CONSTRUCTION MATH**

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 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.

#### **HANDS-ON EXPERIENCES**

#### **CARPENTRY, HVAC, MASONRY, ELECTRICITY, AND PLUMBING**

1. Carpentry activities that include:
  - the construction of shop projects involving a variety of hand and power tools.
  - framing layouts.
  - the construction, squaring and plumbing of walls.
  - the installation of trim and moldings.
  - the development of material lists.

- the design and Install closet organizers in YA house project.
2. HVAC activities that include:
    - applying techniques of copper tubing processes.
    - applying techniques of plastic tubing processes.
    - applying techniques for the cutting, fabrications, and assembly of sheet metal.
    - applying techniques for low voltage wiring.
  3. Masonry activities that include:
    - the stringing of mortar.
    - the swiping of mortar.
    - the buttering of brick and block.
    - the construction of common brick and block patterns.
    - the hanging of a mason's line.
    - applying finishing and striking techniques.
  4. Construction Electricity activities that include:
    - the use of lab boards for wiring simple circuits.
    - the use of lab boards for wiring parallel circuits.
    - the use of lab boards for wiring series circuits.
    - the use of lab boards for wiring 3 – way circuits.
    - the use of lab boards for wiring 4 – way circuits.
  5. Plumbing activities that include:
    - applying techniques of Copper tubing processes.
    - applying techniques of plastic tubing processes.
    - applying techniques of pipe threading processes.