

## **Masonry 1, 2, 3, and 4 6250, 6251, 6252, 6253**

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

### **NCCER CONTREN® CORE MODULES**

#### **MODULE A: BASIC SAFETY**

1. Identify the responsibilities and personal characteristics of a professional craftsman.
2. Explain the role that safety plays in the construction crafts.
3. Describe what job-site safety means.
4. Explain the appropriate safety precautions around common job-site hazards.
5. Demonstrate the use and care of appropriate personal protective equipment.
6. Follow safe procedures for lifting heavy objects.
7. Describe safe behavior on and around ladders and scaffolds.
8. Explain the importance of the HazCom (Hazard Communication Standard) requirement and MSDs (Material Safety Data Sheets).
9. Describe fire prevention and fire fighting techniques.
10. Define safe work procedures around electrical hazards.
11. Complete 10-hour OSHA course/assessment and receive card. (SDE Requirement)

#### **MODULE B: BASIC 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 percents and percents 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 C: INTRODUCTION TO HAND TOOLS**

1. Recognize and identify some of the basic hand tools used in the construction trade.
2. Use these tools safely.
3. Describe the basic procedures for taking care of these tools.

### **MODULE D: INTRODUCTION TO POWER TOOLS**

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

### **MODULE E: INTRODUCTION TO BLUEPRINTS**

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 F: BASIC RIGGING (Optional)**

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.

### **MODULE G: BASIC COMMUNICATION SKILLS (SDE Requirement)**

1. Explain techniques for communicating effectively with coworkers and supervisors.
2. Demonstrate verbal and written communication skills necessary in the workplace.
3. Demonstrate telephone and e-communication skills necessary in the workplace.

### **MODULE H: BASIC EMPLOYABILITY SKILLS (SDE Requirement)**

1. Identify the roles of individuals and companies in the construction industry.
2. Explain the importance critical thinking and problem solving skills in the workplace.
3. Describe computer systems and their industry applications.
4. Explain interpersonal relationship skills, self-presentation, and key workplace issues such as sexual harassment, stress, and substance abuse.

## **MASONRY 1, 2, 3, AND 4**

**RESOURCES:** Prentice-Hall, Contren® Learning Series, Masonry Level 1 and 2, latest edition.

### **UNIT A: 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.

### **UNIT B: 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.

### **UNIT C: 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.

## **UNIT D: 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.

## **UNIT E: 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.

# **MASONRY - ADVANCED**

For schools with more classroom instructional hours, choose from the list of advanced standards for your second and third year students. The first priority in adding standards would be to include industrial motor controls to your customized list.

## **ADVANCED UNIT A: 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.

## **ADVANCED UNIT B: 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.

## **ADVANCED UNIT C: 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.

#### **ADVANCED UNIT D: 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.

#### **ADVANCED UNIT E: 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.

#### **ADVANCED UNIT F: CONSTRUCTION TECHNIQUES AND MOISTURE CONTROL**

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.

#### **ADVANCED UNIT G: 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.

**ADVANCED UNIT H: 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.