

## **NCCER CARPENTRY CURRICULUM**

*The following is a brief description of subjects contained in all four levels of the carpentry program as well as the core curricula that all level one students are expected to pass. "*

*This curriculum is for carpentry apprentices and assumes you are already employed by a carpentry firm! If that is not the case you may apply to become an apprentice with the Cornhusker Training Trust by clicking on this link <http://www.abcnebraska.org/Graduation/Education.aspx>*

### **CORE CURRICULUM**

*The core curricula provides a basic introduction to construction work for all crafts. The core curricula is an internet based self-study course and is not taught in the class room like carpentry levels 1-4.*

#### **Basic Safety**

Explains the safety obligations of workers, supervisors, and managers to ensure a safe workplace. Discusses the causes and results of accidents and the dangers of rationalizing risk. Reviews the role of company policies and OSHA regulations in maintaining a safe work place. Introduces common job-site hazards and protections such as lockout/tagout, persona protective equipment (PPE), and HazCom.

#### **Introduction to Construction Math**

Reviews basic mathematical functions such as adding, subtracting, dividing, and multiplying whole numbers, fraction, and decimals, and explains their applications to the construction trades. Explains decimal-fraction conversions and the metric system using practical examples. Also reviews basic geometry as applied to common shapes and forms.

#### **Introduction to Hand Tools**

Introduces trainees to hand tools that are widely used in the construction industry, such as hammers, saws, levels, pullers, vises and clamps. Explains the specific applications of each tool and shows how to use them properly. Also discusses important safety and maintenance issues related to hand tools.

#### **Introduction to Power Tools**

Provides detailed descriptions if commonly used power tools such as drills, saws, grinders, and sanders. Reviews applications, proper use, safety, and maintenance. Many illustrations show power tools used in on-the-job settings.

#### **Introduction to Construction Drawings**

Covers construction drawings, components, and symbols. Discusses different types of drawings and describes how to interpret and use drawing dimensions.

#### **Basic Rigging**

Explains how ropes, chains, hoist, loaders, and cranes are used to move material and equipment from one location to another on a job site. Describes inspection techniques and load-handling safety practices. Also reviews American National Standards Institutes (ANSI) hand signals.

#### **Basic Communication Skills**

Provides trainees with techniques for communicating effectively with co-workers and supervisors. Includes practical examples that emphasize the importance of verbal and written information and instructions on the job. Also discusses effective telephone and e-mail communication skills.

#### **Basic Employability Skills**

Identifies the roles of individuals and companies in the construction industry. Introduces trainees to critical thinking and problem solving skills and computer systems and their industry applications. Also review effective relationship skills, effective self-presentation, and key workplace issuers such as sexual harassment, stress, and substance abuse.

### **Orientation to the Trade**

Reviews the history of the trade, describes the apprentice program, identifies career opportunities for carpentry and construction workers, and lists the responsibilities and characteristics a worker should possess.

### **Building Materials, Fasteners and Adhesives**

Provides an overview of the building materials used in construction work, including lumber, sheet materials, engineered wood products, structural concrete, and structural steel. Also describes the various fasteners and adhesives used in construction work.

### **Hand and Power Tools**

Provides detailed descriptions of the hand tools and portable power tools used by carpenters. Emphasis is on safe and proper operation of tools, as well as care and maintenance.

### **Introduction to Construction Drawings, Specifications, and Layout**

Covers the techniques for reading and using construction drawings and specifications with an emphasis on drawings and information relevant to the carpentry trade. Introduces quantity takeoffs.

### **Floor Systems**

Covers framing basics as well as the procedures for laying out and constructing a wood floor using common lumber as well as engineered building materials.

### **Wall Systems**

Describes procedures for laying out and framing walls, including roughing-in door and window openings, constructing corners, partition Ts and bracing wall. Includes the procedure to estimate the materials required to frame walls.

### **Ceiling Joist and Roof Framing**

Describes types of roofs and provides instructions for laying out rafters for gable roofs, hip roofs and valley intersections. Covers stick-built and truss-built roofs and valley intersections. Includes the basics of roof sheathing installation.

### **Basic Stair Layout**

Introduces types of stairs and common building code requirements related to stairs. Focuses on techniques for measuring and calculating rise, run, and stairwell openings, laying out stringers, and fabricating basic stairways.

### **Introduction to Building Envelope Systems**

Introduces the concepts of the building envelope and explains its components. Describe types of windows, skylights, and exterior doors, and provides instructions for installation.

## **CARPENTRY LEVEL TWO – SEMESTER TWO**

### **Commercial Drawings**

Describes the types and uses of drawings prepared for commercial structures. Provides information about the format and content of commercial drawings and their use in conveying specific construction requirements. Describes the standard format for specifications.

### **Roofing Applications**

Covers the common materials used in residential and light commercial roofing, along with the safety practices and application methods for these materials. Includes shingles, roll roofing shakes, tiles, metal, and membrane roofs, as well as the selection and installation of roof vents.

### **Thermal and Moisture Protection**

Covers the selection and installation of various types of insulating materials in walls, floors, and attics. Also covers the uses and installation practices for vapor barriers and waterproofing materials.

### **Exterior Finishing**

Covers the various types of exterior siding used in residential construction and their installation procedures, including wood, metal, vinyl and cement board siding.

### **Cold-Formed Steel Framing**

Describes the types and grades of steel framing materials and includes instruction for selecting and installing metal framing for interior walls, exterior nonbearing walls, and partitions.

### **Drywall Installation**

Describes the various types of gypsum drywall, their uses, and the fastening devices and methods used to install them. Contains detailed instructions for installing drywall on walls and ceilings using nails, drywall screws, and adhesives. Also covers fire-and sound-rated walls.

### **Drywall Finishing**

Covers the materials, tools, and methods used to finish and patch gypsum drywall. Includes coverage of both automatic and manual taping tools.

### **Doors and Door Hardware**

Covers the installation of metal doors and related hardware in steel-framed, wood framed, and masonry walls, along with their related hardware such as locksets and door closers. Also covers the installation of wooden doors, folding doors, and pocket doors.

### **Suspended Ceilings**

Includes the materials, layout, and installation procedures for many types of suspended ceilings used in commercial construction, as well as ceiling tiles, drywall suspension systems, and pan-type ceilings.

### **Window, Door, Floor, and Ceiling Trim**

Covers the different types of trim used in finish work. Focuses on the proper methods for selecting, cutting, and fastening trim to provide a professional finished appearance.

### **Cabinet Installation**

Provides detailed instructions for the selection and installation of base and wall cabinets and countertops.

## **CARPENTRY LEVEL THREE-SEMESTER THREE**

### **Properties of Concrete**

Describes the properties, characteristics, and uses of cement aggregates and other materials that, when mixed together, form different types of concrete. Covers procedures for estimating concrete volume and testing freshly mixed concrete, as well as methods and materials for curing concrete.

### **Rigging Equipment**

Describes the use and inspection of basic equipment and hardware used in rigging, including slings, wire rope, chains, and attaching hardware such as shackles, eyebolts, and hooks, as well as rigging knots. Explains sling angles. Also covers tuggers, jacks, hoists, and come-alongs.

### **Rigging Practices**

Describes basic rigging and crane hazards and related safety procedures, provides an overview of personnel lifting and lift planning, and introduces crane load charts and load balancing.

### **Trenching and Excavating**

Prepares the trainee for working in and around excavations, particularly in preparing building foundations. It covers types and bearing capacities of soils; procedures used in shoring, sloping, and shielding trenches and excavations; trenching safety requirements, including recognition of unsafe conditions; and mitigation of groundwater and rock when excavating foundations.

### **Reinforcing Concrete**

Explains the selection and uses of different types of reinforcing materials. Describes general requirements for cutting, bending, splicing and tying reinforcing steel, and the placement of the steel in of footings, columns, walls, and slabs.

### **Foundations and Slab-on-Grade**

Covers basic site layout safety, tools, and methods; layout and construction of deep and shallow foundations; types of foundation forms; layout and formation of slab-on-grade; and forms used for curbing and paving.

### **Vertical Formwork**

Covers the applications and construction methods for various types of forming and form hardware system for walls, columns, and stairs, as well as slip forms, climbing forms, and shaft forms. The module also provides an overview of the assembly, erection, and stripping of gang forms.

### **Horizontal Formwork**

Covers the types of elevated decks and the formwork systems and methods used in their construction. It covers joist, pan, metal deck, and flat slab systems and provides instructions for the use of flying forms, as well as shoring and reshoring.

### **Handling and Placing Concrete**

Covers tools, equipment, and procedures for safely handling, placing, and finishing concrete. Describes joints made in concrete structures and the use of joint sealants.

### **Tilt-up Wall Panels**

Describes how tilt-up concrete construction is used and how tilt-up panels are formed, erected, and braced. Covers the installation of rebar and types of embedments used to lift and brace the panels. Also covers methods used to create architectural and decorative treatments.

## **CARPENTRY FOUR-SEMESTER FOUR**

### **Site Layout One- Distance Measurements and Leveling**

Covers the principles, equipment, and methods used to perform the site layout task of distance measurement and differential leveling. Also covers the layout responsibilities of surveyors, field engineers, and carpenters; understanding and using site/plot plan drawings; and methods used for on-site communication.

### **Site Layout Two: Angular Measurement**

Covers the principles, equipment, and methods used to perform the site layout tasks that require making angular measurements. Includes laying out building foundation lines and determining elevations by trigonometric leveling. Covers the use of laser instruments, transits, theodolites, electronic distance measurement, and total stations are covered. Reviews trade mathematics, including geometry and right-angle trigonometry.

### **Advanced Roof Systems**

Covers commercial roofing materials and structures and describes the procedures for installing commercial roofing such as standing seam, lap seam, and built-up roofs.

### **Advanced Wall Systems**

Covers installation of variety of finishing materials, including paneling, wainscoting, and movable partitions. Also covers installation of curtain walls and fire-rated commercial construction.

### **Advanced Stair Systems**

Provides extensive coverage of the materials and techniques used in finishing wooden staircases. Also covers a variety of stair systems used in commercial construction.

### **Introduction to Light Equipment**

Introduces various pieces of light construction equipment commonly used at a construction site, including the aerial lift, skid steer loader, trencher, electric power generator, compressor, compactor, and forklift. Provides an overview of general safety, operation and maintenance procedures equipment covered.

### **Welding**

Introduces the equipment, procedures, and safety practices used in cutting steel with oxyfuel equipment and in shielded metal arc welding. Includes lab practice in cutting and welding techniques.

## **Commercial Finish Work**

Introduces the variety of specialized finish materials used on interior and exterior walls, ceilings, and floors of commercial buildings.

## **Site Preparation**

Covers the planning process that precedes the start of work on a construction site, including environmental considerations, personnel issues, access roads, traffic control, permits, site safety, utilities, and crane-related concerns.

## **Fundamentals of Crew Leadership**

Along with the principles of the project planning, scheduling, estimating, and management, teaches basic skills required for supervising personnel. Includes several case studies.

*Updated 07/14*



## **The NCCER Program**

NCCER (*National Center for Construction Education & Research*) maintains a portable and widely recognized credentialing and certification system through its Registry. This Registry assures portability of skills by providing transcripts, certificates and wallet cards to students who successfully complete the NCCER Curriculum through an accredited sponsor. These valuable industry credentials benefit students as they seek employment and build their careers. To be entered in NCCER's Automated National Registry, you must complete and sign a Registration and Release form. This form will be completed on the first night of classes in each semester and requires your Social Security # and your signature.

NCCER has developed a consistent program of accreditation, instructor certification, standardized curriculum, registry, assessment and certification, which is a key element in developing a skilled workforce of craft professionals.

NCCER is the accrediting body for the industry and establishes the benchmark for quality training and assessments. By partnering with industry and academia, NCCER has developed a system for program accreditation that is similar to those found in institutions of higher learning. This process ensures that students receive quality training based on uniform standards and criteria.

The NCCER Curriculum In cooperation with publishing partner Pearson, has developed and publishes a world-class curriculum created by "Subject Matter Experts" representing contractors and schools from around the country. "Subject Matter Experts" ensure exceptional training programs that meet or exceed national industry standards. The NCCER Curriculum, which includes more than 60 craft areas, is taught worldwide by contractors, associations, construction users, and secondary and post-secondary schools. In addition, multiple state Departments of Education recognize the curriculum along with the U. S. Dept. of Labor - Office of Apprenticeship.