Ironworking

**LEVEL 1**

### Curriculum Notes
- 235 Hours
- Includes 72.5 hours of Core Curriculum, which is a prerequisite for Level 1 completion and must be purchased separately.
- Revised: 2011, Second Edition
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.
- A Spanish translation is available. Please see NCCER’s online catalog for more information.

### Modules
- **Tools and Equipment of the Trade** (10 Hours)
  (Module ID 30103-11) Identifies safety tools and equipment. Describes the proper use of hand and power tools. Identifies power sources for ironworking tools.
- **Fastening** (5 Hours)
  (Module ID 30104-11) Explains how to recognize A-325 and A-490 bolts, washers, and nuts. Describes how to correctly tension bolts and explains procedures for calibrated wrench and turn-of-nut tightening methods.
- **Mobile Construction Cranes** (10 Hours)
  (Module ID 30105-11) Identifies common lifting equipment and construction cranes. Describes how to use crane manuals, perform record keeping, and follow safety requirements. Provides procedures for assembling construction cranes.
- **Rigging Equipment** (10 Hours)
  (Module ID 30106-11) Describes the use and inspection of equipment and hardware used in rigging. Describes slings and explains how to determine sling capacities and angles. Covers the selection and inspection of rigging equipment, including block and tackle, chains, hoists, come-alongs, jacks, and tie-downs.
- **Rigging Practices** (15 Hours)
  ISBN 978-0-13-215103-0
  (Module ID 30107-11) Describes the site and environmental hazards associated with rigging. Explains how to attach rigging hardware for routine lifting and identify the components of a lift plan. Describes how to perform sling tension calculations and determine the weight of beams and basic weight estimation.
- **Trade Drawings One** (12.5 Hours)
  (Module ID 30108-11) Identifies the materials used in steel-frame buildings. Explains how to read basic structural blueprints.
- **Structural Ironworking One** (7.5 Hours)
  (Module ID 30109-11) Identifies the types of construction that utilize structural steel, the components of the structures, and the process involved in erecting a steel structure. Explains the principles of structural stresses and the requirements of bolted connections.

### Training Resources
- **PAPERBACK**
  - Trainee Guide: $69.99
  - Individual Modules: $24.99
  - ISBN 978-0-13-213714-0

### Order Information
- To Order Call: 1-800-922-0579
- www.nccer.org/instructors
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**LEVEL 2**

### Curriculum Notes
- 162.5 Hours
- Revised: 2011, Second Edition
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at www.nccer.org/irc.

### Modules
- **Trade Math** (25 Hours)
  (Module ID 30201-11) Explains fractions and basic math, and includes multiple opportunities for practical applications.
- **Weld Quality** (10 Hours)
  (Module ID 29106-09; from Welding Level One, Fourth Edition) Identifies the codes that govern welding, including marine welds. Identifies and explains weld imperfections and causes. Describes non-destructive testing, visual inspection criteria, welder qualification tests, and the importance of quality workmanship.
- **Position Arc Welding** (20 Hours)
  (Module ID 30202-11) Identifies and explains weld joints, weld positions, and open V-butt welds. Describes how to prepare arc welding equipment and how to make flat welds, horizontal welds, vertical welds, and overhead welds.
- **Forklifts** (17.5 Hours)
  (Module ID 30203-11) Identifies the basic components of forklifts and the corresponding hand signals. Explains safe practices and how to perform inspections. Covers how to read load charts and how to operate forklifts.

### Training Resources
- **PAPERBACK**
  - Individual Modules: $24.99

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Ironworking Level 2 (continued)

Trade Drawings Two (10 Hours)
(Module ID 30204-11) Introduces types of structural plans and describes the information included on each type. Presents the sequences of erection plans for each step of construction and identifies the symbols and abbreviations used on drawings.

Intermediate Rigging (10 Hours)
(Module ID 38201-11; from Intermediate Rigging, First Edition) Describes basic procedures for using various slings in hitches and calculating sling stress. Introduces tools and equipment used for the lateral movement of loads without a crane. Trainees learn how to reeve block and tackle, invert loads with hoists, and drift a load between two hoists.

Structural Ironworking Two (30 Hours)
(Module ID 30205-11) Describes pre-erection activities for structural steel. Provides procedures for erecting bearing devices, columns, beams, girders, joists, bracing, and bridging.

Steel Joists and Joist Girders (15 Hours)
(Module ID 30206-11) Identifies the types of joists, methods of end support, and the types of bridging available. Explains how to locate the ironworking information on framing plans and describes steel joist installation procedures. Describes the conditions necessary and the benefits of panelizing bar joist.

Advanced Rigging (10 Hours)
(Module ID 38301-11; from Advanced Rigging, First Edition) Explains techniques for rigging and moving loads up an inclined plane and the line pull required are examined along with the application of equalizer beams. The movement of loads on an inclined plane and the line pull required are examined in detail. The module concludes with guidance in the rigging and handling of rebar bundles.

Precast/Tilt-Up Erection (12.5 Hours)
(Module ID 30311-12) Describes the fabrication and uses of precast concrete elements and cast-in-place tilt-up wall systems. Focuses on rigging practices associated with these two distinct construction methods and the role of ironworkers in their installation.

Special Application Hoisting Devices (10 Hours)
(Module ID 30307-12) Explains techniques for rigging and moving equipment using a variety of hoisting devices, including gin poles, Chicago booms, A-frames, davits, balance beams, pump handles, high lines, caterpillar dollys, rollers. Also covers special cranes, including derricks, gantries, HLDs, trolley cranes, and jacking frames.

Survey Equipment Use and Care Two (15 Hours)
(Module ID 30315-12) Focuses on the total station and its uses, including setup and controls. It includes information on primary and secondary control points and procedures for turning horizontal angles and plumbing columns and wall panels.

Pre-Engineered Systems (5 Hours)
(Module ID 30302-12) Identifies the structural components and accessories of metal buildings and describes their installation. Describes the pre-erection and erection procedures that apply to their installation and the safety precautions associated with their installation.

Miscellaneous/Ornamental Ironworking (5 Hours)
ISBN 978-0-13-292289-0
(Module ID 30303-12) Identifies the types of ornamental metal and describes the different types of components used in ornamental ironworking. Explains the skills required to fabricate and install ornamental components safely.

Grating and Checkered Plate (5 Hours)
(Module ID 30316-12) Provides general information and procedures for the installation and attachment of gratings and checker plate. Describes the rigging methods associated with grating and checker plate.

Air Carbon Arc Cutting and Gouging (12.5 Hours)
(Module ID 29104-09; from Welding Level One, Fourth Edition) Introduces air-carbon arc cutting equipment and processes. Identifies the electrodes and safe operation of the equipment. Provides step-by-step instructions for performing air-carbon arc washing and gouging activities.

Demolition (10 Hours)
(Module ID 30310-12) Identifies the tools used to remove rivets and explains the demolition skills required to safely remove structural steel beams, steel columns, and steel reinforced concrete columns.