

# APPLIED INDUSTRIAL TECHNOLOGY (IRONWORKING) (ATIW)

## ATIW-1300 Structural Steel Concepts 2 Credits

Introduction to structural steel concepts, including an overview of historical use of iron and steel in construction. Fundamental principles of and preparation for erection of structural steel; blueprint reading; and proper use of tools, according to OSHA regulations.

*Lecture: 2 hours*

*Prerequisite(s): Admission to Ironworking apprenticeship program, or departmental approval.*

## ATIW-1310 Safety for Ironworkers 1 Credit

Occupational safety and health standards for construction industry in general, and ironworking trade specifically. Includes regulations and procedures for fall protection; electrical work; scaffolding; confined spaces; personal protective equipment; materials handling, storage, use and disposal; hand and power tools; steel erection; and cranes, derricks, hoists, elevators, and conveyors.

*Lecture: 1 hour*

*Prerequisite(s): Admission to Ironworking apprenticeship program, or departmental approval.*

## ATIW-1320 Steel Construction Procedures 1 Credit

Occupational safety and health standards for construction industry in general, and ironworking trade specifically. Includes regulations and procedures for fall protection; electrical work; scaffolding; confined spaces; personal protective equipment; materials handling, storage, use and disposal; hand and power tools; steel erection; and cranes, derricks, hoists, elevators, and conveyors.

*Lecture: 1 hour*

*Prerequisite(s): Admission to Ironworking apprenticeship program, or departmental approval.*

## ATIW-1330 Erection Concepts & Practices 3 Credits

Principles and techniques of structural steel erection, including detailing procedures. Covers installation of temporary flooring, accurate alignment of steel assembly, safety nets and railings, and various types of connections: bolts, rivets and pins, layout and erection of bar joists, bridging, scaffolds and ladders, according to OSHA regulations. Includes blueprint reading.

*Lecture: 3 hours*

*Prerequisite(s): ATIW-1300 Structural Steel Concepts or concurrent enrollment, and ATIW-1310 Safety for Ironworkers or concurrent enrollment, or departmental approval.*

## ATIW-1400 Principle of Reinforcing Steel 2 Credits

Basic principles of reinforcing steel, using tools and methods necessary for layout and fabrication, according to engineering and placing drawings. Application of basic structural building forms to reinforce concrete structures, including structural value of footings and use of beam and slab design; history of reinforced concrete and manufacturing process of reinforcing steel; and basic types of highway structures.

*Lecture: 2 hours*

*Prerequisite(s): ATIW-1300 Structural Steel Concepts or concurrent enrollment, and ATIW-1310 Safety for Ironworkers or concurrent enrollment, or departmental approval.*

## ATIW-1410 Practical Applications of Reinforcing Steel 1 Credit

Applications relating to placement of reinforcing steel in footings, walls, columns, beams, girders, joists and slabs and to bar splicing. Continued study of highway structures, including airport paving. Introduction to reinforcing accessories, dowels, and mechanical couplers.

*Lecture: 1 hour*

*Prerequisite(s): ATIW-1300 Structural Steel Concepts or concurrent enrollment, and ATIW-1310 Safety for Ironworkers or concurrent enrollment, or departmental approval.*

## ATIW-1600 Welding Fundamentals for Ironworkers 3 Credits

Fundamentals of welding with special emphasis on the ironworking trade. Includes welding processes; cutting and gouging processes; operational and site safety; welding equipment and tools; and safety equipment and protective clothing.

*Lecture: 3 hours*

*Prerequisite(s): ATIW-1300 Structural Steel Concepts, and ATIW-1310 Safety for Ironworkers; or departmental approval.*

## ATIW-1806 Special Topics in Unbonded Post Tensioning 2 Credits

Course covers the principals and theory of pre-stressed, un-bonded post tensioning and the application techniques including re-tensioning procedures. Also included are the basics of drawing interpretation of field documents required for uniform layout and placement of stressing tendons. A discussion of tendon failure and resolution is included.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Ironworker's apprenticeship program.*

## ATIW-2300 Shielded Metal Arc Welding 3 Credits

Shielded metal arc welding principles and techniques. Includes required equipment tools and supplies, electrical and environmental safety, eye hazards associated with arc burn, and protective clothing requirements.

*Lecture: 3 hours*

*Prerequisite(s): ATIW-1600 Welding Fundamentals for Ironworkers or concurrent enrollment, or departmental approval.*

## ATIW-2310 Welding Specialties 3 Credits

In-depth study of welding and cutting techniques. Students will perform oxy-fuel gas welding and cutting techniques, arc cutting and gouging, and stud welding as applied to ironworking trade.

*Lecture: 3 hours*

*Prerequisite(s): ATIW-2300 Shielded Metal Arc Welding or concurrent enrollment, or departmental approval.*

**ATIW-2320 Welding Blueprints and Design**

**3 Credits**

In-depth study of welding blueprint lines, arrows, views, and symbols; basic layout construction; and identification of welding positions, parts of fillet welds, groove joints and welds, and backup materials. Includes recognition, drawing, measurement calculations, and problem solving.

*Lecture: 3 hours*

*Prerequisite(s): ATIW-2310 Welding Specialties or concurrent enrollment, or departmental approval.*

**ATIW-2330 Pre-Construction Planning of Speciality Applications**

**2 Credits**

Includes erection sequence and handling of speciality products. Installation of members and connections performed in compliance with OSHA regulations.

*Lecture: 2 hours*

*Prerequisite(s): ATIW-2320 Welding Blueprints and Design, or departmental approval.*

**ATIW-2340 Speciality Installation Equipment**

**2 Credits**

Study and use of equipment in installation of specialty building products. Safety training including employee, equipment, and jobsite safety and procedures for material handling and inspections, according to OSHA regulations.

*Lecture: 2 hours*

*Prerequisite(s): ATIW-2330 Pre-Construction Planning of Speciality Applications or concurrent enrollment, or departmental approval.*

**ATIW-2350 Ornamental Systems & Railings**

**2 Credits**

Installation methods for and identification of various ornamental applications, including curtainwall and window wall systems, stairs, railings, and wall handrails, and their anchors and fasteners. Use of hand and power tools for installation. Operation of various layout instruments.

*Lecture: 2 hours*

*Prerequisite(s): ATIW-2330 Pre-Construction Planning of Speciality Applications or concurrent enrollment, or departmental approval.*

**ATIW-2360 Ornamental Applications**

**2 Credits**

Procedures for and installation of ornamental applications, including rolling service doors, sloped walls, metal and ship ladders, toilet partitions, vanity supports, relief angles, flagpoles, and chain link fences.

*Lecture: 2 hours*

*Prerequisite(s): ATIW-2350 Ornamental Systems and Railings or concurrent enrollment, or departmental approval.*

**ATIW-2400 History of Iron Workers Union**

**3 Credits**

The Iron Workers Union in America from 1896 through today, including people and events that influenced the organization.

*Lecture: 3 hours*

*Prerequisite(s): ATIW-2350 Ornamental Systems and Railings or concurrent enrollment, or departmental approval.*

**ATIW-2500 Rigging and Hoisting**

**3 Credits**

Procedures of rigging and hoisting including identification, handling, and storage of equipment: chains, hardware, reeving, slings with practice of knot tying and splicing. Topics include characteristics and uses of cranes, procedures for inspection, safe operation, testing and maintenance of cranes, including machine assembly and set-up procedures. Safety procedures and hand signaling, according to OSHA regulations.

*Lecture: 3 hours*

*Prerequisite(s): ATIW-2360 Ornamental Applications or concurrent enrollment, or departmental approval.*