Course Information Form (CIF)

Course Code: IRW 114

Course Title: Structural Steel Erection

Department: Applied Sciences and Technologies
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 48.0506
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 3-9-6
Credit Hour Distribution:

Lecture: 3	Lab: 9	Clinical: 0	**Total: 6**

General Course Information

Catalog Description

Aspects of erecting structural steel, including history of iron and steel, plans and drawings, preparing materials, selecting a raising gang, erection of components, and fastening components and detailing. Welding, burning, mobile cranes, tower cranes, and bridges.

General Course Objectives

The student will demonstrate fundamental skills and understanding in erecting structural steel.

Minimum Placement Levels

English	Reading	Math
None	None	None

Prerequisites

Credit in IRW 113

Methods of Evaluation

At least 4 written examinations; at least 3 practical examinations.

Instructional Materials and Additional Supplies

Structural Steel, Volumes 1, 2, and 3, International Association of Ironworkers

Course Content

General Learning Outcomes (GLOs)

- Technology: Students will demonstrate the ability to evaluate, select, and appropriately use current and emerging tools.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Historical Uses of Iron and Steel: A. Iron, B. Steel, C. Iron Workers, D. Hoisting Engine, E. Basic Steel Erection Procedure	1. Describe the historical development of the use of iron and steel in construction.	1	0	0
Manufacture of Iron and Steel: A. Historical Development, B. Raw Materials for Steel, C. Iron Making, D. Steel Making, E. Forming Steel Products	1. Describe the process, materials, and facilities involved in the manufacture of iron and steel.	2	3	0
Review of Drawing Interpretation: A. Steel Shapes, B. Alphabet of Lines, C. Architect's Scale, D. Dimensioning, E. Basic Projections, F. Title Blocks and Notes, G. Materials List and Notes, H. Types of Drawings, I. Symbols, J. Abbreviations	1. Read and interpret structural steel erection drawings.	2	3	0
Erection Basics: A. Procedure Components, B. Safety, C. Tools and Equipment, D. Welding	1. Identify the basic components, tools, equipment, welding, and safety precautions used in structural steel erection.	2	3	0
Erection of Structural Steel: A. Types of Jobs, B. Preparation, C. The Setting, D. False Work, E. Field Connections, F. Unloading, G. Directing, H. Hooking, I. Signaling, J. Connecting, K. Placing and Guying, L. Fastening, M. Other Installation, N. Safety and Hazards	1. Describe the process of erecting structural steel.	2	3	0
Unloading Iron: A. Yarding and the Yard Gang, B. Job Type, C. Railroad Cars, D. Safety	1. Describe the personnel, procedures, and safety precautions used when unloading iron for various types of jobs.	2	3	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Shaking Out Iron: A. Tools and Equipment, B. Multi-Story Jobs, C. Single Story Jobs, D. Bridges	1. Describe the tools, equipment, and procedures used in shaking out iron for various types of jobs.	1	3	0
Anchor Bolts: A. Types, B. Preparation for Base Plates, C. Placing Shims	1. Identify various types of anchor bolts and describe their use in relation to base plates and shims.	1	3	0
Raising Gang: A. Responsibilities, B. Qualifications	1. Describe the responsibilities and qualifications of raising gang members. 2. Demonstrate safe behavior as a member of a raising gang.	1	3	0
Erecting Components: A. Columns; B. Beams; C. Girders; D. Trusses; E. Topping Out; F. Bracing; G. Flooring, Nets, and Railing (Installation, Mesh Size, Near Water, Railings)	1. Describe the equipment, procedures, and safety precautions for erecting columns, beams, girders, trusses, bracing, flooring, nets, and railings.	3	3	0
Plumbing and Aligning Structural Steel: A. Procedure, B. Equipment, C. Commentating for Welding, D. Safety, E. Structure	1. Describe the equipment, procedures, and safety precautions for plumbing and aligning structural steel in various types of structures. 2. Demonstrate various methods of safely plumbing and aligning steel.	3	16	0
Bolting-Up of Structural Steel: A. Equipment and Tools, B. Bolt Types, C. Bolts Behavior, D. Inspection, E. Bolted Connections, F. Tightening High-Strength Bolting, G. Calibration for Installation, H. Load Indicator Washer, I. Determining Length, J. Washers, K. LeJeune Tension Control Fastening System, L. React-A-Matic Power Torque Wrench and Bolting System	1. Describe the equipment, tools, procedures, and inspection procedures used for making bolted, riveted, and pinned connections. 2. Demonstrate various connections.	3	15	0
Riveted and Pinned Connections	1. Describe the equipment, tools, procedures, and inspection procedures used for making bolted, riveted, and pinned connections. 2. Demonstrate various connections.	3	6	0
Erection of Bar Joists and Bridging: A. Historical Background, B. Drawings, C. Procedures	1. Describe the planning, drawing, equipment, and procedures used for the erection of bar joist and bridging.	3	3	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Detailing: A. Application, B. Equipment and Tools, C. Procedures, D. Stairway Safety, E. Ladders, F. Channel Bucks, G. Grating	1. Describe the equipment, tools, and procedures used for various types of detailing including stairways, ladders, channel bucks, and grating.	2	6	0
Welding and Burning	1. Describe the welding and burning processes used in structural steel erection.	3	6	0
Scaffolds and Ladders: A. Float, B. Needle Beam Scaffold, C. Swinging Scaffolds, D. Boatswain Chair, E. Stationary and Rolling Tubular Welded Frame Scaffolds, F. Material Hoist Towers, G. Personal Hoists, H. Ladders	1. Describe the types, construction, applications, and safety precautions of scaffolds, hoists, and ladders used in structural steel erection.	3	6	0
Mobile Cranes: A. Machine Selection; B. Inspection, Testing, and Maintenance; C. Machine Assembly and Setup; D. Operating Procedures and Precautions	1. Describe the components, inspection, testing, maintenance, assembly, setup, and operation of mobile cranes used in structural steel erection.	3	16	0
Tower Cranes: A. The Machine; B. Inspection, Testing and Maintenance; C. Erecting, Climbing, Dismantling, and Transporting; D. Operating Procedures and Precautions; E. Kangaroo Tower Cranes	1. Describe the components, inspection, testing, maintenance, assembly, setup, and operation of tower cranes used in structural steel erection.	3	16	0
Bridges: A. Tension, B. Components, C. Materials, D. Types, E. Cables, F. Catwalks	1. Describe the types, components, and materials of bridge construction.	2	18	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	135	0