Hoisting & Rigging Syllabus

Time: 40 hours

Maximum Class Size: 12

Prerequisites: None

Course Description: OSHA and ANSI require that crane operators receive training to operate a crane before they are considered qualified. Rigging personnel must also learn basic safe work practices when lifting and landing loads with a crane. Participants will learn about types of cranes, boom trucks, and basic math used to calculate capacities and volume. In addition, participants will learn how to use rigging hardware and slings. Signaling responsibilities, communication, and voice commands are also covered. To successfully complete this certification course, participants must pass all hands-on evaluations and a written exit exam with a score of 80% or above.

Goals/Objectives/Student Learning Outcomes:

- Describe some of the common errors that cause most crane and rigging accidents
- Describe and demonstrate at least six safe work practices for working with and around cranes and explain why each is important
- Identify at least six different types of cranes
- Using scenarios involving cranes working near high voltage lines, give the minimum clearance between the crane and lines based on OSHA standards
- Define the regulations that must be followed, and work practices that must be used, when using cranes to hoist personnel
- Describe and demonstrate five safe work practices related to rigging and hoisting
- Describe three situations that warrant the use of a signal person
- Describe five responsibilities of a signal person
- Describe the two methods of communicating with an operator.
- Describe two essential practices a signal person should do before signaling and the importance of each
- With the commands for hand signals available, correctly perform at least 15 crane hand signals
- Demonstrate the ability to communicate with an operator by using clear and precise voice commands
- Solve problems involving linear distance, are, and volume using standard formulas

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Goals/Objectives/Student Learning Outcomes:

- Determine the load weights and centers of gravity for sample common construction materials of regular shapes using standard formulas
- Describe the effect that the sling angle has on slings and hardware
- Solve problems involving calculating sling tension for even leg slings
- Solve problems involving linear distance, area, and volume using standard formulas
- Determine the load weights and centers of gravity for sample common construction materials or regular and irregular shapes using standard formulas
- Describe the effect that the sling angle has on slings and hardware
- Locate an object's center of gravity when it's offset
- Determine the vertical reaction of slings when one sling is carrying more weight than the other
- Calculate the length and angles of the rigging triangle using mathematical methods
- Solve problems involving calculating sling tension for even and uneven legs using standard formulas
- Identify the parts of a hoisting hook and describe the purpose of each
- Describe what might happen if a hook is "point loaded"
- Describe and demonstrate the inspection for hoisting hooks. List and identify five signs of damage to inspect for
- Identify six additional types of rigging hardware, describe the function of each, and describe how to inspect each piece of hardware
- Explain how to properly and safely attach each piece of hardware to the load or rigging as necessary
- Describe eight types of sling configurations and identify the situation each is used to
- Using sample objects to rig, identify and rig each object with the most appropriate configuration
- List and identify five materials used to make slings and under what conditions, identified through inspection, they must be removed from service
- List and describe the three basic components of wire rope and define the purpose of each
- Identify four permanent markings that synthetic slings must have on them and explain the meaning of each
- Complete the Exit Exam (A or B) with a score of 80% or more
- Complete performance assessments with 100% accuracy

Standards Addressed:

OSHA 1926.1427 Subpart CC:	Cranes and Derricks in Construction.
ANSI A10.42:	Rigging Qualifications and Responsibilities.

Classroom Rules and Procedures:

- All classes begin at 6:30 am and end at 3:00 pm

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- Upon entering classroom, all participants must sign in and be seated by 6:30 am
- Class will consist of a combination of lecture, video, demonstration, coached group exercises, individual exercises and assessment.
- Students are required to report to class ready to work and maintain the provided PPE

Textbooks/Readings/Materials:

- LIUNA: 40-Hour *Hoisting & Rigging IG*
- LIUNA: 40-Hour *Hoisting & Rigging* PG
- Hoisting& Rigging Student Handout Packet
- LIUNA: Hoisting & Rigging PowerPoint
- DVD: Hoisting & Rigging Procedures
- DVD: Signaling

Tools/Equipment/Other Materials:

- Crane
- Synthetic Slings
- Wire Rope Slings
- Assorted rigging hardware
- Spreader bar (optional)
- 2-way, 3-way, or 4-way spreader (optional)
- Calculator
- Clipboard
- Rigging card
- Materials:
- Scaffold plank
- Lumber
- Pipe
- Beams
- Rebar
- Skip box
- Machinery such as compressor, compaction equipment, pump, generator
- IT1: Station Labels
- Calculators
- Various size thimbles
- Various sizes and types of shackles
- Shouldered and non-shouldered eye bolts
- Hoist rings of different sizes, shapes and materials
- Turnbuckles with different end fittings
- Links or rings of different sizes and shapes
- Scaffold planks

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- Pipe sections (preferably 10'-15' long)
- Trench box
- Pallet of block, secured
- Concrete slabs
- Assorted construction equipment-compressor, generator, portable lights, etc.
- Culverts
- Crane or Boom Truck
- Small Object to be lifted (Concrete block, timber, etc.)
- Sling and Hardware to rig objects to be lifted
- Two-way radios-3 with chargers
- Extra batteries
- Video camera/IPad

Personal Protective Equipment

- 12 pairs of gloves
- 12 pairs of safety glasses
- 12 pairs of ear plugs
- 12 hard hats

Course Requirements

To receive credit for the course, participants must:

- Be present for full forty hours
- Participate in all classroom exercises
- Pass a written exam

Course Policies

- Participants must be on-time and ready to work.
- Participants must return from breaks on-time.
- Participants must participate in each exercise and assignment
- Participants who are on "light duty" are not allowed to take this course due to the physically demanding requirements.

Assessment and Grading

Participants will be assessed on the following:

- All written exams must be passed with a score of 80% or above.

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- All hands-on activities and exercises are graded on performance and participation. They are pass/fail and must be passed with a score of 80% or above.

Safety

Failure to maintain and use PPE may result in dismissal from the course.