

ATLT-2802: SPECIAL TOPICS: CRANE PREVENTATIVE MAINTENANCE

Cuyahoga Community College

Viewing: ATLT-2802 : Special Topics: Crane Preventative Maintenance

Academic Term:

Spring 2019

Subject Code

ATLT - AIT-Lifting Technologies

Course Number:

2802

Title:

Special Topics: Crane Preventative Maintenance

Catalog Description:

Advanced course covering the preventative maintenance procedures required for different crane types. Included are prescriptive measures as stated in OSHA and ANSI standards. The course addresses specific safety procedures mandated by Federal safety regulations

Credit Hour(s):

1

Lecture Hour(s):

1

Requisites

Prerequisite and Corequisite

Departmental approval: admission to Lifting Technologies Apprenticeship program.

Outcomes

Course Outcome(s):

Discuss the purpose of crane preventative maintenance as prescribed by the Occupational Safety and Health Administration (OSHA) and the American National Standards Institute (ANSI) standard types and use of equipment and maintenance requirements and schedules.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Discuss the importance of maintaining industrial cranes in accordance with manufacturing requirements.
1. Identify the industry safety standards requiring maintenance.
1. List and define the terms used in crane maintenance.
1. Identify the different types of industrial cranes.
1. Describe the crane classifications including duties, usage, and environment.
1. Explain the various maintenance schedules with regards to crane types.

Course Outcome(s):

II. Demonstrate the ability to perform preventative maintenance on industrial overhead cranes and gantries.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Select the hand and power tools required for crane maintenance.
1. Identify the various equipment used on crane maintenance and safely operate to perform tasks.
1. Apply relative safety standards with respect to maintenance operations.
1. Review the maintenance records of specific crane being serviced.
1. Perform operational test to establish current condition and required maintenance.
1. Perform lock-out/tag out procedures as prescribed by OSHA.
1. Perform the required maintenance procedures in accordance with manufactures recommendations and safety standards.
1. Verify maintenance procedures by testing operational functions for proper lifting, braking, and limit switches and perform load test as required.
1. Conduct and exit meeting with company representative to include maintenance procedures and verify crane service.

Methods of Evaluation:

Evaluation of Student Achievement or Proficiency:

Participation and contribution to discussions (Individual)	20%
Assignments	20%
Quizzes & Exams	30%
Practical Application Projects	30%
	100%

Participation & Contribution to discussions (Individual) 20%

Your own contribution to the discussion based on your unique experience and knowledge is a critical part of the success of the course for everyone. Note 20% depends on your performance in this facet of the course. This is often enough to make a difference in final grades. The instructor will expect informed insightful, comments from individuals both in the classroom as well as the practical lab (shop) activities. The grade for participation is not based on quantity but instead on the quality of the contributions.

Assignments 20%

Assignments may be individual or done in teams and provides the opportunity for you to inject some of your own learning and experience more directly into the mix.

Quizzes and Exams 30%

These individual assignments may be a combination of written, oral or practical in nature.

Practical Application Projects 30%

This portion of the course will help you develop a comprehensive understanding of the materials. Periodically throughout the course, you may be required to perform and display your understanding of the materials in a practical shop setting.

Note:

Class assignments, quizzes, exams and projects dates may be altered, rescheduled, changes, deleted or added by the instructor.

Grade Computation:

Your grade in this course is based on a combination of individual and group related classroom and lab work.

Grades are reported as follows:

- A: Indicates consistently excellent work
- B: Indicates work of the quality normally expected from Lifting Technologies Apprentice student
- C: Indicates the minimum acceptable level of work from a Lifting Technologies Apprentice student
- D: Indicates below minimum acceptable level of work (requires review and evaluation with Mazzella Companies)*
- F: Indicates below minimum acceptable level of work (requires review and evaluation with Mazzella Companies)*
- I: Indicates incomplete (either due to attendance (withdrawal) or lack of work being submitted)

Grades A, B, and C maybe modified by a plus or minus as appropriate. See below scale.

A+: 99-100%	C+: 78-79%
A: 93-98%	C: 73-77%
A-: 90-92%	C-: 70-72%
B+: 88-89%	69% and below*
B: 83-87%	
B-: 80-82%	

*Any grade achieved below a 70% or "C-" is unacceptable and requires that the Lifting Technologies Apprentice student to re-register and re-take the course. Any Apprentice not achieving a grade of 70% or "C-" will be required to meet with Mazzella Companies'

Apprenticeship Program Coordinator to review and evaluate continuation in the Lifting Technologies Apprenticeship Program prior to re-registering and retaking.

Late Assignments and Make-up work:

Mazzella Companies expects that Apprentice's exhibit good planning and time management skills throughout the course semester. Late assignments (assignments not turned at the scheduled, or agreed upon, deadline) will result in a minimum of a 10% reduction.

Instructors Expectations:

Lifting Technologies Apprentice Program requires that each student review the Rules and Regulations of the Mazzella Companies Apprenticeship Committee and Company policies.

Participation in the Mazzella Companies Apprentice Program for Lifting Technologies requires that students attend each of classes during the semester. "Excused" absences must be approved by the instructor prior to the missed class and will be documented and reviewed by Mazzella Companies' Apprenticeship Program Coordinator.

It is the responsibility of the Apprentice to schedule a make-up class with the instructor as well as any work required (note: late assignment and make-up work policy).

Arriving late and or leaving early from a scheduled class will be recorded as "incomplete" and may be subject to the Apprentice scheduling a make-up class with the instructor and will be subject to review by Mazzella Companies' Apprenticeship Program Coordinator.

All implied, related and otherwise not stated rules and policies of Mazzella Companies apply to students when attending or participating in the Mazzella Companies Lifting Technologies Apprentice Program.

Course Content Outline:

Course Outline

I. Crane preventative maintenance

A. Purpose

1. Equipment life
2. Safety
3. Manufacturers recommendation
4. Operational downtime
5. Repair costs

B. Safety standards

1. Occupational Safety and Health Administration OSHA
 - a. 29 CFR 1910.179
 - b. Overhead and gantry crane
2. ANSI
3. Manufacturers recommendations
4. Internal company standards

C. Terminology

1. Preventative maintenance
2. Predictive maintenance
3. Gantry
4. Common wear
5. Inspections
6. Lubrication
7. Operational
8. Hoist
9. Trolley
 10. Bridge

D. Crane types

1. Top running overhead
2. Top running gantry
3. Under running
4. Hot metal
5. Classifications
 - a. "A"
 - b. "B"
 - c. "C"

- d. "D"
- e. "E"
- 6. Manual
- 7. Electrical
- 8. Pneumatic
- 9. Outdoor
 - 10. Indoor
- E. Classifications
 - 1. Duties
 - a. Warehouse
 - b. General production
 - c. Plating
 - d. Hot metal
 - 2. Usage
 - a. Lifts per shift
 - b. Lifts at capacity
 - c. Critical lift
 - d. Engineered lift
 - 3. Environment
 - a. Excessive heat
 - b. Excessive cold
 - c. Chemical
 - d. Moisture
- F. Maintenance Schedule
 - 1. Inspection
 - 2. Usage
 - 3. Environment
 - 4. Operators
 - 5. OSHA safety guidelines
 - 6. Manufactures requirements
- II. Crane Maintenance
 - A. Tools
 - 1. Hand tools
 - a. Screw driver
 - b. Testing
 - c. Wrenches
 - d. Hex keys
 - e. Measuring devices
 - f. Hammer
 - 2. Power tools
 - a. Impact wrench
 - b. Grinder
 - c. Saw
 - d. Drill motor
 - B. Equipment
 - 1. Ladder
 - 2. Man lift
 - 3. Scaffolding
 - 4. Service platforms
 - 5. Funnel
 - 6. Grease gun
 - 7. Lighting

C. Safety Standards

1. Fall protection
 2. Personal protection equipment
 3. Arc flash gear
 - a. Gloves
 - b. Jacket
 - c. Face shield
 - d. Head gear
 4. Lock out/tag out
 5. Barricades
- ### D. Maintenance records
1. Manuals
 2. Inspections
 3. Repairs/Modifications
 4. Replaced parts

Resources

European Materials Handling Federation (FEM). *Rules for the Design of Hoisting Appliances*. current. European Materials Handling Federation, Brussels, Belgium, Copyright 1998.

Crane Manufacturer Association of America (CMAA); A Division of Material Handling Industry. *CMAA-70 Specifications for Top Running Bridge and Gravity Type Multiple Girder Electric Overhead Traveling Cranes*. current. Charlotte, NC 28217: Crane Manufacturers Association of America, a Division of Material Handling Industry, 2010. 2010.

Crane Manufacturers Association of America, a Division of Material Handling Industry. *CMAA-74 Specifications for Top Running and Under Running Single Girder Electric Traveling Cranes Utilizing Under Running Trolley Hoist*. current. Charlotte, NC: Crane Manufacturers Association of America, a Division of Material Handling Industry, 2010. 2010.

Resources Other

www.manitowoccranes.com

- <https://www.mazzellacompanies.com>

www.theconstructionmachinery.com/cranes.html

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