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Northeast Wisconsin Technical College

10-620-140 054776 Machine Wiring and Safety

Course Outcome Summary

Course Information

Description	10-620-140 MACHINE WIRING AND SAFETY ...introduction to machine wiring, including basic documentation, labeling, and wiring practices; an overview of NFPA 79 machinery, safety and installation standards.
Total Credits	1
Total Hours	36

Course History

Last Revision Date	4/10/2019

Employability Skills

1. Communicate Effectively
2. Demonstrate Personal Accountability
3. Solve Problems Effectively
4. Think Critically and Creatively
5. Value Individual Differences and Abilities
6. Work Cooperatively and Professionally

Program Outcomes

1. TSA1 - Perform work safely
2. TSA4 - Communicate Technical Information
3. Understand and apply knowledge of electricity, electronics, hydraulics, and electric motors and mechanics.
4. Read technical drawings, schematics, and diagrams.
5. Document technical information through descriptive writing, sketches/diagrams, mathematical expression, computation, and graphs.
6. Perform electrical, mechanical, and fluid measurements by properly selecting tools and test equipment.

7. Perform electrical/mechanical assembly/disassembly, repair, or calibrate components by properly selecting tools and equipment and following procedures.
8. Understand the overall operation and control of machines.
9. Apply critical thinking skills to solving problems.
10. Perform safe work practices.

Course Competencies

1. Select terminal blocks for an application

Assessment Strategies

By selecting terminal blocks for an application under the instructor's observation, given appropriate information resources and

Learning Objectives

1.a. Study various types of electrical panels
1.b. Describe the function of three types of electrical panels
1.c. Study various types of electrical terminal blocks
1.d. Describe the function of electrical terminal blocks
1.e. Compare terminal blocks for an application

Criteria

Your performance will be successful when:

1.1. you generalize the function of an electrical panel
1.2. you categorize at least three types of electrical panels
1.3. you summarize the characteristics of terminal blocks
1.4. you select the correct terminal block for an application

2. Install a terminal block in an electrical panel

Assessment Strategies

By installing a terminal block in an electrical panel under the instructor's observation, given basic tools and appropriate information resources.

Learning Objectives

2.a. Study different types of terminal blocks
2.b. Articulate the differences between different types of terminal blocks
2.c. Identify the installation requirements of terminal blocks

Criteria

Your performance will be successful when:

2.1. you ascertain the terminal block characteristics that are required for the intended installation
2.2. you choose a terminal block that can be installed in the chosen location
2.3. you describe how to install a terminal block
2.4. you use appropriate tools to install a terminal block

3. Label wire numbers on an electrical print

Assessment Strategies

By labeling wires on an electrical print under the instructor's observation, given your lab experiences and appropriate information resources

Criteria

Your performance will be successful when:

3.1. you summarize the importance of using wire number labels
3.2. you propose a method of labeling wire numbers that is consistent with industry standards.
3.3. you determine which industry standards are applicable to the electrical system you intend to construct
3.4. you demonstrate knowledge of the industry standards for labeling wire numbers

4. Determine the number of wires to run from a control panel to an operator station

Assessment Strategies

By determining the number of wires to run from a control panel to an operator station under the instructor's observation, given project specifications and appropriate information resources

Learning Objectives

4.a. Study examples of wiring drawings
4.b. Discuss the methods of combining various types of wires.
4.c. Recognize the various types of wires.
4.d. Describe the various types of interpanel wiring.

Criteria

Your performance will be successful when:

4.1. you determine which project drawings define the wiring between the control panel and the operator station
4.2. you summarize the number of wires between the control panel and the operator station
4.3. you classify the voltage and current range of the wiring
4.4. you combine the wiring in groups to minimize interference between wires of different classifications

5. Determine the wire colors needed for an application

Assessment Strategies

By determining the wire colors needed for an application under the instructor's observation, given a case study and appropriate information resources

Learning Objectives

5.a. Describe the function of wire color coding in electrical control
5.b. Study the various methods used to color code wiring in electrical panels
5.c. Describe how to determine the wire colors needed in an electrical panel

Criteria

Your performance will be successful when:

5.1. you explain the types of wire color coding used in electrical panels
5.2. you determine which project drawings define the wiring between the connected panels.
5.3. you summarize the groups of wires between the connected panels.
5.4. you designate the colors associated with the voltage and current range of the wiring
5.5. you combine the wiring in groups to minimize interference between wires of different classifications

6. Select wire size and type for an application

Assessment Strategies

By selecting wire size and type for an application under the instructor's observation, given your lab experiences and appropriate information resources

Learning Objectives

6.a. Describe the function of a conductor
6.b. List the two components of a conductor
6.c. Describe the factors that affect conductor selection
6.d. Study common cllassifications of wire
6.e. Study the physical characteristics of conductor ampacity

Criteria

Your performance will be successful when:

6.1. you determine the ampacity needed for the wiring application
6.2. you determine the insulation type required for the wiring application
6.3. you select the correct guage and insulation type for the application
6.4. you select stranded or solid wire as required by the application

7. Select a disconnect for an application

Assessment Strategies

By selecting the correct disconnect for an application under the instructor's observation, given your lab experiences and appropriate information resources

Learning Objectives

7.a. Study the function of a disconnect
7.b. State the function of a disconnect
7.c. Study the types of disconnects commonly used
7.d. Classify disconnects based on size and installation environment.

Criteria

Your performance will be successful when:

7.1. you select the correct disconnect for the anticipated load requirements
7.2. you select the correct disconnect for the installation environment
7.3. you specify special features to match the disconnect to the application

8. Select circuit protection for an application

Assessment Strategies

By selecting circuit protection for an application under the instructor's observation, given appropriate information resources and basic test instruments

Learning Objectives

8.a. Study the function of overcurrent protection for a circuit
8.b. Describe the function of overcurrent protection for a circuit
8.c. Study the criteria for sizing overcurrent protection for a circuit
8.d. Describe how to size circuit protection

Criteria

Your performance will be successful when:

8.1. you explain the function of overcurrent protection
8.2. you recommend the type of overcurrent protection for a circuit
8.3. you select the size of the overcurrent protection for a circuit