

# Central Community College

## Mechatronics I

### Description

A study of Mechatronics systems. The Student will become familiar with various system components and their function in Industrial Machines. The student will gain an understanding of circuit design, installation, maintenance and repair principles including troubleshooting and schematic interpretation.

### Goals

- 1 Provide a basic knowledge of Mechatronic Systems.
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- 2 Provide a basic knowledge of schematic design and interpretation.
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- 3 Install, maintain and repair Mechatronic Systems.
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- 4 Troubleshoot Mechatronic Systems.
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### Textbooks

1. Festo. *Mechatronics*. Publisher: Festo. Required
2. Allen Stenzel. *Mechatronics I Lab Book*. Publisher: Central Community College. Required

### Competencies, Learning Objectives, and Performance Standards

#### ***Unit I.---Documentation of a Automated System.***

#### **1. Demonstrate Project Planning**

##### ***Learning objectives***

*What you will learn as you master the competency:*

- a. Discuss Project Phases.
- b. Create a Gantt Chart
- c. Create a Network Analysis.

#### **2. Develop an Analysis of Material Flow.**

### **Learning objectives**

*What you will learn as you master the competency:*

- a. Define Material Flow.
- b. Differentiate between Types of Material Flow.
- c. Create an Analysis of Material Flow.

### **3. Develop an Automated Systems Planning Concept.**

#### **Learning objectives**

*What you will learn as you master the competency:*

- a. Discuss the Planning of the Automation Sequence.
- b. Discuss the Development of the Control Concept.
- c. Create the Planning of Automated Sequences.

## **Unit II---Commissioning of Automated Systems**

### **1. Implement the Commissioning Phase.**

#### **Learning objectives**

*What you will learn as you master the competency:*

- a. Conduct a Test on the Fine Adjustment of the Pneumatic/Mechanical Drives.
- b. Conduct a Check on the Electrical Connections between the Sensors and the PLC.
- c. Conduct a Test on the Emergency Stop Function.
- d. Conduct a Test on the PLC Outputs.
- e. Perform Loading of the Program.
- f. Perform a Test on all Program Functions and Operating Modes.

### **2. Construct a Maintenance Schedule.**

#### **Learning objectives**

*What you will learn as you master the competency:*

- a. Create a Service Sheet.
- b. Create an Inspection Sheet.
- c. Create a Repairs List.

### **3. Implement Faultfinding.**

#### **Learning objectives**

*What you will learn as you master the competency:*

- a. Define Systematic Repairs.
- b. Define Systematic Faultfinding.
- c. Create Fault Documentation.
- d. Conduct Faultfinding Practices.

### **Unit III.---Constructing an Automated Systems.**

#### **1. Learning objectives**

*What you will learn as you master the competency:*

- a. Build Pneumatic Diagrams/Schematics for the Industrial Machines.
- b. Build Electrical Diagrams/Schematics for the Industrial Machines.
- c. Build Sequence of Descriptions for the Industrial Machines.
- d. Create User Guides for the Industrial Machines.

#### **2. Learning objectives**

*What you will learn as you master the competency:*

- a. Build Machines to Perform Desired Task.
- b. Adjust Mechanical Components on the Industrial Machines.
- c. Adjust Electrical Components on the Industrial Machines.
- d. Adjust Pneumatic Components on the Industrial Machines.

#### **3. Learning objectives**

*What you will learn as you master the competency:*

- a. Install Programmable Logic Controller(s) (PLC).
- b. Program Programmable Logic Controller(s) (PLC).
- c. Troubleshoot Mechatronic System.