



Western Technical College

## 10620102 Intro to Process Controls

### Course Outcome Summary

#### Course Information

<b>Description</b>	This course introduces the concepts of automatic process control on the technician level. Students will study process controls for flow, pressure, temperature, and level found in industrial applications. Open and closed-loop feedback will be used with different controller modes to improve overall stability. Safety of these systems will be covered through labs and class discussions.
<b>Career Cluster</b>	Manufacturing
<b>Instructional Level</b>	Associate Degree Courses
<b>Total Credits</b>	2
<b>Total Hours</b>	54

#### Pre/Corequisites

Prerequisite 10620164 Automated Systems Integration

#### Textbooks

*Instrumentation and Process Control*. 7th Edition. Copyright 2019. Kirk, Franklyn W., Thomas A. Weedon, and Phillip Kirk. Publisher: American Technical Publishers, Inc. **ISBN-13:** 978-0-8269-3446-8. Required.

#### Success Abilities

1. Cultivate Passion: Enhance Personal Connections

#### Course Competencies

1. **Explore process control systems.**  
Assessment Strategies

1.1. Written Objective Test

**Criteria**

*You will know you are successful when:*

- 1.1. You explain industry needs for process control systems.
- 1.2. You discuss issues related to industrial process control systems.
- 1.3. You identify common process control systems used.
- 1.4. You identify common process control feedback systems.
- 1.5. You compare digital and analog process control systems.
- 1.6. You identify various process control system controllers.

**Learning Objectives**

- 1.a. Explore industry needs for process control systems.
- 1.b. Explore issues related to industrial process control systems.
- 1.c. Identify common process control systems used.
- 1.d. Identify common process control feedback systems.
- 1.e. Explore digital and analog process control systems.
- 1.f. Identify various process control system controllers.

**2. Explore the four modes of industrial process control.**

**Assessment Strategies**

2.1. Written Objective Test

**Criteria**

*You will know you are successful when*

- 2.1. You describe the function of a P (Proportional) control system.
- 2.2. You describe the function of a PI (Proportional, Integral) control system.
- 2.3. You describe the function of a PID (Proportional, Integral, Derivative) control system.
- 2.4. You describe the function of a On/Off control system.

**Learning Objectives**

- 2.a. Examine the function of a P (Proportional) control system.
- 2.b. Examine the function of a PI (Proportional, Integral) control system.
- 2.c. Examine the function of a PID (Proportional, Integral, Derivative) control system.
- 2.d. Examine the function of a On/Off control system.

**3. Investigate a temperature process control system.**

**Assessment Strategies**

3.1. Written Objective Test

**Criteria**

*You will know you are successful when:*

- 3.1. You identify input devices used in temperature process control systems.
- 3.2. You identify output devices used in temperature process control systems.
- 3.3. You identify control devices used in temperature process control systems.
- 3.4. You identify the relationship between devices used in temperature process control systems.

**Learning Objectives**

- 3.a. Investigate input devices used in temperature process control systems.
- 3.b. Investigate output devices used in temperature process control systems.
- 3.c. Investigate control devices used in temperature process control systems.
- 3.d. Investigate relationship between devices used in temperature process control systems.
- 3.e. Explore application of temperature process control systems.

**4. Build a temperature process control system.**

**Assessment Strategies**

4.1. Demonstration

**Criteria**

*You will know you are successful when:*

- 4.1. You design a temperature control system.
- 4.2. You build a temperature control system.
- 4.3. You run the control system while monitoring the conditions.
- 4.4. You troubleshoot the system.
- 4.5. You adjust system parameters to insure operation.

#### **Learning Objectives**

- 4.a. Design a temperature control system.
- 4.b. Build a temperature control system.
- 4.c. Run the control system while monitoring the conditions.
- 4.d. Troubleshoot the system.
- 4.e. Adjust system parameters to insure operation.

### **5. Investigate a pressure process control system.**

#### **Assessment Strategies**

- 5.1. Written Objective Test

#### **Criteria**

*You will know you are successful when:*

- 5.1. You identify input devices used in pressure process control systems.
- 5.2. You identify output devices used in pressure process control systems.
- 5.3. You identify control devices used in pressure process control systems.
- 5.4. You identify the relationship between devices used in pressure process control systems.

#### **Learning Objectives**

- 5.a. Investigate input devices used in pressure process control systems.
- 5.b. Investigate output devices used in pressure process control systems.
- 5.c. Investigate control devices used in pressure process control systems.
- 5.d. Investigate relationship between devices used in pressure process control systems.
- 5.e. Explore application of pressure process control systems.

### **6. Investigate a fluid level process control system.**

#### **Assessment Strategies**

- 6.1. Written Objective Test

#### **Criteria**

*You will know you are successful when:*

- 6.1. You identify input devices used in fluid level process control systems.
- 6.2. You identify output devices used in fluid level process control systems.
- 6.3. You identify control devices used in fluid level process control systems.
- 6.4. You identify the relationship between devices used in fluid level process control systems.

#### **Learning Objectives**

- 6.a. Investigate input devices used in fluid level process control systems.
- 6.b. Investigate output devices used in fluid level process control systems.
- 6.c. Investigate control devices used in fluid level process control systems.
- 6.d. Investigate relationship between devices used in fluid level process control systems.
- 6.e. Explore application of fluid level process control systems.

### **7. Build a fluid level process control system.**

#### **Assessment Strategies**

- 7.1. Demonstration

#### **Criteria**

*You will know you are successful when:*

- 7.1. You design a fluid level control system.
- 7.2. You build a fluid level control system.
- 7.3. You run the control system while monitoring the conditions.

- 7.4. You troubleshoot the system.
- 7.5. You adjust system parameters to insure operation.

**Learning Objectives**

- 7.a. Design a fluid level control system.
- 7.b. Build a fluid level control system.
- 7.c. Run the control system while monitoring the conditions.
- 7.d. Troubleshoot the system.
- 7.e. Adjust system parameters to insure operation.

**8. Investigate a fluid flow process control system.**

**Assessment Strategies**

- 8.1. Written Objective Test

**Criteria**

*You will know you are successful when:*

- 8.1. You identify input devices used in fluid flow process control systems.
- 8.2. You identify output devices used in fluid flow process control systems.
- 8.3. You identify control devices used in fluid flow process control systems.
- 8.4. You identify the relationship between devices used in fluid flow process control systems.

**Learning Objectives**

- 8.a. Investigate input devices used in fluid flow process control systems.
- 8.b. Investigate output devices used in fluid flow process control systems.
- 8.c. Investigate control devices used in fluid flow process control systems.
- 8.d. Investigate relationship between devices used in fluid flow process control systems.
- 8.e. Explore application of fluid flow process control systems.