



Western Technical College

10620164 Automation Systems Integration

Course Outcome Summary

Course Information

Description	This course covers the coordination and application of automation technologies into an integrated and automated manufacturing system. These technologies include PLCs, Drives, HMIs, and analog/digital modules and field devices.
Career Cluster	Manufacturing
Instructional Level	A.A.S. - Associate in Applied Science
Total Credits	2
Total Hours	72

Textbooks

No textbook required.

Success Abilities

1. Cultivate Passion: Enhance Personal Connections
2. Cultivate Passion: Expand a Growth-Mindset
3. Cultivate Passion: Increase Self-Awareness
4. Live Responsibly: Develop Resilience
5. Live Responsibly: Embrace Sustainability
6. Live Responsibly: Foster Accountability
7. Refine Professionalism: Act Ethically
8. Refine Professionalism: Improve Critical Thinking

Program Outcomes

1. Perform work safely.
2. Troubleshoot electrical and mechanical systems and devices.

3. Repair electrical and mechanical systems.
4. Communicate technical information.
5. Integrate electrical and mechanical systems and devices.

Course Competencies

1. Create a Human Machine Interface (HMI) application.

Assessment Strategies

- 1.1. Written objective test
- 1.2. Skill demonstration

Criteria

You will know you are successful when

- 1.1. you use the programming software.
- 1.2. you identify and select objects for the application.
- 1.3. you program the objects.
- 1.4. you save the project.
- 1.5. you develop multiple HMI screens for a project.
- 1.6. you define and apply terms related to HMI programming.

Learning Objectives

- 1.a. Access the programming software.
- 1.b. Identify and select objects for the application.
- 1.c. Program the objects.
- 1.d. Save the project.
- 1.e. Develop multiple HMI screens for a project.

2. Integrate an HMI into a tag based system.

Assessment Strategies

- 2.1. Written objective test
- 2.2. Skill demonstration

Criteria

You will know you are successful when

- 2.1. you wire communications and power to HMI and applicable devices.
- 2.2. you configure drivers, programs and hardware settings for needed HMI communications.
- 2.3. you download and run a program into HMI for optimal operation.
- 2.4. you troubleshoot HMI operation.
- 2.5. you fix any problems identified.
- 2.6. you define and apply terms related to HMI integration and application.

Learning Objectives

- 2.a. Wire communications and power to HMI and applicable devices.
- 2.b. Configure drivers, programs and hardware settings for needed HMI communications.
- 2.c. Download and run a program into HMI for optimal operation.
- 2.d. Troubleshoot HMI operation.
- 2.e. Fix any problems identified.

3. Investigate a remote IO system.

Assessment Strategies

- 3.1. Written objective test
- 3.2. Skill demonstration

Criteria

You will know you are successful when

- 3.1. you identify components of a remote IO system.

- 3.2. you identify how a remote IO system functions.
- 3.3. you describe how input and output devices are connected to remote IO.

Learning Objectives

- 3.a. Identify components of a remote IO system.
- 3.b. Identify how a remote IO system functions.
- 3.c. Determine how input and output devices are connected to remote IO.

4. Integrate remote IO into a tag based system.

Assessment Strategies

- 4.1. Written objective test
- 4.2. Skill demonstration

Criteria

You will know you are successful when

- 4.1. you wire communications and power to remote IO and applicable devices.
- 4.2. you configure drivers, programs and hard ware settings for needed remote IO communications.
- 4.3. you program PLC to control remote IO in a tag based system.
- 4.4. you troubleshoot remote IO operation within a tag based system.
- 4.5. you fix any problems identified.
- 4.6. you define and apply terms related to the integration and application of remote I/O in a tag based system.

Learning Objectives

- 4.a. Wire communications and power to remote IO and applicable devices.
- 4.b. Configure drivers, programs and hard ware settings for needed remote IO communications.
- 4.c. Program PLC to control remote IO in a tag based system.
- 4.d. Troubleshoot remote IO operation within a tag based system.
- 4.e. Fix any problems identified.

5. Integrate a variable frequency drive (VFD) into a tag based system.

Assessment Strategies

- 5.1. Written objective test
- 5.2. Skill demonstration

Criteria

You will know you are successful when

- 5.1. you wire communications and power to VFD and applicable devices.
- 5.2. you configure drivers, programs and hard ware settings for needed VFD communications.
- 5.3. you program VFD for optimal operation.
- 5.4. you program PLC to control VFD in a tag based system.
- 5.5. you troubleshoot VFD operation within the tag based system.
- 5.6. you fix any problems identified.
- 5.7. you define and apply terms related to VFD application and integration in a tag based system.

Learning Objectives

- 5.a. Wire communications and power to VFD and applicable devices.
- 5.b. Configure drivers, programs and hard ware settings for needed VFD communications.
- 5.c. Program VFD for optimal operation.
- 5.d. Program PLC to control VFD in a tag based system.
- 5.e. Troubleshoot VFD operation within the tag based system.
- 5.f. Fix any problems identified.

6. Integrate a servodrive system into a tag based system.

Assessment Strategies

- 6.1. Written objective test
- 6.2. Skill demonstration

Criteria

You will know you are successful when

- 6.1. you wire communications and power to servodrive and applicable devices.
- 6.2. you configure drivers, programs and hard ware settings for neededservodrive communications.
- 6.3. you program servodrive for optimal operation.
- 6.4. you program PLC to control a servodrive in a tag based system.
- 6.5. you troubleshoot servodrive operation within a tag based system.
- 6.6. you fix any problems identified.
- 6.7. you define and apply terms related to servodrive application and integration in a tag based system.

Learning Objectives

- 6.a. Wire communications and power to servodrive and applicable devices.
- 6.b. Configure drivers, programs and hard ware settings for needed servodrive communications.
- 6.c. Program servodrive for optimal operation.
- 6.d. Program PLC to control a servodrive in a tag based system.
- 6.e. Troubleshoot servodrive operation within a tag based system.
- 6.f. Fix any problems identified.