



MONROE COUNTY
COMMUNITY COLLEGE

Course Outcome Summary

Required Program Core Course

ELEC 141

Automation and Process Control

Course Information

Division	Applied Science and Engineering Technology
Contact Hours	60
Theory	30
Lab Hours	30
Total Credits	3.0

Prerequisites: ELEC 125

Course Description

This course covers typical industrial control systems for machine tool processes and materials handling. Included are programmable logic controllers, open-loop and closed-loop control, effects of varying proportional band, integral (reset) time-constant and derivative (rate) time-constant, operating principles and applications of electrical transducers (thermocouples, photocells, tachometers, etc.), output devices (valves and valve-operators, AC and DC motors etc.) and principles and applications of DC drive systems.

This course is a required core course for students pursuing an AAS in Electrical Engineering Technology

Program Outcomes Addressed by this Course:

Upon successful completion of this course, students should be able to:

- B. Utilize Virtual Instrumentation, Data Acquisition, Schematic Capture and Test and Applications software packages to refine skills and to analyze and design various electronic circuits.
- C. Develop and demonstrate effective wiring and laboratory skills.
- D. Demonstrate Equipment/Instrumentation Competence
- H. Develop and demonstrate the synergistic relationship and integration of various technical and academic fields into the study of Electronics (i.e. Mechatronics)
- I. Design, Construct, and Troubleshoot AC and DC Motor Control Circuits and demonstrate an understanding of process control



Course Outcomes

In order to evidence success in this course, the students will be able to:

1. Incorporate a process controller using PLC logic

Applies To Program Outcome

- B. Utilize Virtual Instrumentation, Data Acquisition, Schematic Capture and Test and Applications software packages to refine skills and to analyze and design various electronic circuits.
- C. Develop and demonstrate effective wiring and laboratory skills.
- D. Demonstrate Equipment/Instrumentation Competence
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2. Tune a PID controller.

Applies To Program Outcome

- B. Utilize Virtual Instrumentation, Data Acquisition, Schematic Capture and Test and Applications software packages to refine skills and to analyze and design various electronic circuits.
- C. Develop and demonstrate effective wiring and laboratory skills.
- D. Demonstrate Equipment/Instrumentation Competence
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3. Implement Open Loop Process Control.

Applies To Program Outcome

- B. Utilize Virtual Instrumentation, Data Acquisition, Schematic Capture and Test and Applications software packages to refine skills and to analyze and design various electronic circuits.
- C. Develop and demonstrate effective wiring and laboratory skills.
- D. Demonstrate Equipment/Instrumentation Competence
- H. Develop and demonstrate the synergistic relationship and integration of various technical and academic fields into the study of Electronics (i.e. Mechatronics)
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4. Describe the principles and characteristics of the following control modes:

- a. On-off control
 - b. Proportional
 - c. Proportional plus Integral
 - d. Proportional plus Integral plus Derivative
- Applies To Program Outcome*

- B. Utilize Virtual Instrumentation, Data Acquisition, Schematic Capture and Test and Applications software packages to refine skills and to analyze and design various electronic circuits.
- D. Demonstrate Equipment/Instrumentation Competence
- H. Develop and demonstrate the synergistic relationship and integration of various technical and academic fields into the study of Electronics (i.e. Mechatronics)
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5. Select Instruments to measure process parameters

Applies To Program Outcome

- B. Utilize Virtual Instrumentation, Data Acquisition, Schematic Capture and Test and Applications software packages to refine skills and to analyze and design various electronic circuits.
- D. Demonstrate Equipment/Instrumentation Competence
- H. Develop and demonstrate the synergistic relationship and integration of various technical and academic fields into the study of Electronics (i.e. Mechatronics)
- I. Design, Construct, and Troubleshoot AC and DC Motor Control Circuits and demonstrate an understanding of process control

Date Updated: October 10, 2019

By: MJ Dubois