PC Based Data Acquisition and Control
Outline of Instruction

Course Information

Organization	Monroe County Community College, Applied Science and Engineering Technology
Development Date	8/26/2009
Course Number	ELEC 144
Potential Hours of Instruction	60
Total Credits	3

Description

This course will provide students with the necessary background, theory and laboratory experience to utilize Windows-based computers, LabView software, interface hardware and software for data recording, analysis and on-line control of industrial processes. Multiple inputs and data logging, A/D conversion and various computer interface bus standards are discussed and implemented.

Major Units

1. Serial/Parallel Communications
2. Digital to Analog and Analog to Digital Conversion
3. Sensors and Output Devices
4. Data Acquisition and Control
5. Closed Loop and Open Loop Control
6. Data Acquisition Software
7. Educational/Course Outcomes

Types of Instruction

Instruction Type	Contact Hours	Credits
Lecture/Lab	60	3

Textbooks

None Required.

Learner Supplies

Proto-Board.

Scientific Calculator.

Tools (Not Required).

Prerequisites

ELEC 132

Exit Learning Outcomes
Program Outcomes

A. Acquire and apply technical expertise in the areas of Circuit analysis, Analog electronics, Digital electronics, Microprocessors, and Communication systems.
B. Develop and Demonstrate Problem Solving Skills.
C. Develop a willingness to learn independently.
D. Develop and demonstrate effective wiring and laboratory skills.
E. Demonstrate Equipment/Instrumentation Competence
F. Develop and demonstrate Technical Documentation/Lab Report writing skills and the ability to comprehend Technical Documentation including Schematic Diagrams
G. Value Safety Training, Safe Work Practices and acknowledge Safety Standards
H. Demonstrate a thorough understanding of DC and AC theory and operating concepts.

General Education Outcomes
A. Apply mathematical approaches to the interpretation of numerical information
B. Apply mathematical approaches to the analysis of numerical information
C. Demonstrate an understanding of the process of scientific inquiry
D. Use computer technology to retrieve information

Course Outcomes
1. **Identify/Recognize the definitions and advantages of Data Acquisition and Process Control**
2. **Identify/Recognize the advantages and disadvantages of serial vs. parallel communication**
3. **Identify/Recognize the component parts of a data acquisition board**
4. **Identify/Recognize various sensors and output devices and their applications**
5. **Demonstrate/Practice the construction of a RS-232 protocol (serial) cable and demonstrate its functionality**
6. **Demonstrate/Practice the proper installation/setup of a data acquisition card and software**
7. **Demonstrate/Practice interfacing an input sensor to the data acquisition card and reading its out via the computer**
8. **Demonstrate/Practice interfacing an output device to the data acquisition card and control it via the computer**
9. **Demonstrate/Practice closed loop control using a software package to monitor and control a process**
10. **Demonstrate/Practice closed loop control with PID**
11. **Demonstrate/Practice collecting process data into a spreadsheet program for review**
12. **Demonstrate/Practice access a data acquisition card from a programming language**