

ELC-213 Instrumentation

COURSE DESCRIPTION:

Prerequisites: None

Corequisites: None

This course covers the fundamentals of instrumentation used in industry. Emphasis is on electric, electronic, and other instruments. Upon completion, students should be able to install, maintain, and calibrate instrumentation. Course Hours Per Week: Class, 3. Lab, 2. Semester Hours Credit, 4.

LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Explain, discuss and describe the principles and theories related to basic process control instrumentation.
2. Learn standard symbols for instrumentation hardware.
3. Read and analyze instrumentation diagrams.
4. Understand how humidity, density, viscosity and pH are measured.
5. Understand how regulators, valves and actuators work.
6. Design a simple instrumentation system.
7. Build simple instrumentation circuits for calibration purposes.

OUTLINE OF INSTRUCTION:

- I. The nature of process control
 - A. Measuring
 - B. Comparing
 - C. Computing
 - D. Correcting
- II. Elements of process control
 - A. Measuring variables
 - B. Analog signals
 - C. Digital Signals
 - D. Open and closed loop control
- III. Process control signals
 - A. Analog and digital signals
 - B. Linear signals
 - C. Non-linear signals
 - D. Signal errors
 - E. Signal transmission
 - F. Control loops
- IV. Instrumentation drawings
 - A. Tag numbers
 - B. Drawing symbols
 - C. P&ID
 - D. Loop diagrams

- E. Location drawings
 - F. Wiring diagrams
- V. Using diagrams in process control
- A. Flowcharts
 - B. Electrical diagrams
 - C. PLC diagrams

REQUIRED TEXTBOOK AND MATERIAL:

The textbook and other instructional material will be determined by the instructor.