

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

ELR 212

ELN 229

Course Title: INSTRUMENTATION/PROCESS CONTROL
Code No.: ELN 222
Program: ELECTRICAL/ELECTRONIC TECHNICIAN
Semester: FOUR
Date: JANUARY 1986
Author: ROB PALO

New: _____ Revision: X

APPROVED: _____
Chairperson Date

CALENDAR DESCRIPTION

INSTRUMENTATION/PROCESS CONTROL
Course Name

ELN 222-4
Course Number

PHILOSOPHY/GOALS:

This course is intended to introduce the Electrical/Electronic Technician to process measurement and control.

GRADING:

1. Written tests are conducted at regular intervals and assigned equal weight. Missed tests are graded zero percent provided a legitimate excuse such as illness can be supported by a doctor's certificate. Comprehensive make-up tests will be conducted at the end of the semester for people with missed tests and legitimate excuses.
2. Grading
A - 80 - 100%
B - 66 - 79%
C - 55 - 65%
R - Repeat
3. 70% for tests
30% for labs
4. Lecture and lab attendance are mandatory.

TEXTBOOK(S):

Industrial Solid State Electronics by Timothy J. Maloney

REFERENCE TEXT(S):

Fundamentals of Process Control Theory by Paul W. Murril

COURSE OUTLINE

BLOCK	TOPIC	HOURS
1	Input transducers - measuring devices	6
2	Feedback systems & Servomechanisms	12
3	Final correcting devices and amplifiers	6
4	Nine examples of closed Industrial Systems	6

SPECIFIC OBJECTIVES

1. The student shall understand the theory and method of operation of the following:
 - a) Potentiometers
 - b) LVDT's
 - c) Pressure transducers
 - d) Thermocouples
 - e) Thermistors and RTD's
 - f) Photocells and Photo electric devices
 - g) Strain gauge
 - h) Tachometers
 - i) Humidity transducers

BLOCK 2 - FEEDBACK SYSTEMS

1. The student shall be able to describe the principle of operation and predict the behaviour to a step input for the following:
 - a) Open loop systems
 - b) Closed loop systems
 - g) Process response

BLOCK 3 - FINAL CORRECTING DEVICES

1. The student shall be able to describe the principle of operation and predict the behaviour of the following devices:
 - a) Solenoid valves
 - b) 2 position electric motor driven valves
 - c) Electropneumatic valves
 - d) Electrohydraulic valves
 - e) Valve flow characteristics
 - f) Relay and contactors
 - g) Thyristors
 - h) Split phase AC motors
 - i) AC servo motors
 - j) Solid state AC servo amps
 - k) DC servo motors
 - l) Amps for DC servo motors

BLOCK 4 - NINE INDUSTRIAL CONTROL SYSTEMS

1. The student shall be able to describe the following control systems:
 - a) Thermistor control of quench oil temperature
 - b) A proportional mode pressure control system
 - c) A proportional plus reset temperature controller with thermocouple I/P
 - d) A strip tension controller
 - e) Edge guide control for a strip recoiler
 - f) An auto weighing system
 - g) A carbon dioxide controller for a carburizing furnace
 - h) Control of relative humidity in a textile moistening process
 - i) A warehouse humidity controller