

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

COURSE OUTLINE

Course Title: PROCESS CONTROL
Code No.: PPE 344-5
Program: PULP & PAPER/WATER RESOURCES ENGINEERING TECHNOLOGY
Semester: V
Date: OCTOBER, 1988
Author: JOHN K. THEIL

New:

Revision: X (5)

APPROVED:


Chairperson

Date njivftf,

CALENDAR DESCRIPTION

PROCESS CONTROL

PPE 344-5

Course Name

Course Number

PHILOSOPHY/GOALS;

The course is designed to provide theoretical and practical knowledge of the fundamentals of process control systems. Particular emphasis is placed upon the functioning of the various components, including measuring devices and transducers, transmitters, controller, and final control elements. The course also includes the use of microcomputers in process control loops. The specific objectives are given on the attached.

METHOD OF ASSESSMENT (GRADING METHOD):

Assignments/Laboratory Exercises	30%
Interim Tests 2 @ 20%	40%
Final Examination	30%

GRADING

A+	90-100%
A	80-89%
B	70-79%
C	60-69%
D	50-59%

A passing grade will be based on a minimum composite grading of 60%. Students obtaining a composite grading of 55% to 59% may be allowed to complete a supplementary examination.

TEXTBOOK(S):

Process Measurement Fundamentals, Vol. 1; by T.E. Collis, E.M. Eacho, J.P. Jerald, and M.K. Reardon; General Physics Corporation.

Process Control Fundamentals; by Quintech Division of Lab-Volt.

REFERENCES:

Instrumentation, Third Edition; by F.W. Kirk and N.R. Rimboi. American Technical Publishers, Inc.

Automation and Instrumentation, AWWA Manual M2, Second Edition, American Water Works Society.

Process Instrumentation and Control Systems - Manual of Practice No. OM-6 Water Pollution Control Federation.

OBJECTIVES

The student will be able to:

1. Describe applications of process control and recognize the basic control types.
2. Identify the functions of the components of a control loop and explain the difference between an open loop and a closed loop control using block diagrams.
3. Define and apply the principles of hydrostatics and fluid mechanics, and to use these concepts in appropriate applications.
4. Identify the characteristics and applications of various pressure measuring elements.
5. Select and apply a variety of pressure and level measuring devices.
6. Describe the function of a transmitter.
7. Describe the hardware used in pneumatic to electric and electric to pneumatic switching.
8. Explain the operation of an on-off control loop.
9. Describe the general characteristics and operation of the proportional control mode.
10. Define the purpose of and explain the operation of a control valve, identify control valve components, and select and specify control valves for various processes.
11. Describe process control computer systems, the use of microcomputers in process control loops, and process control methods which may be applied to process control.

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COURSE OUTLINE

<u>TOPICS</u>	<u>HOURS</u>
1. Process Control Applications	4
2. Control Loop Components	3
3. Open and Closed Loop Control	2
4. Principles and Applications of Hydrostatics and Fluid Mechanics	4
5. Characteristics and Applications of Pressure and Level Measuring Devices	4
6. Transmitter Function and Input/Output Calculations	2
7. Pneumatic/Electric Switching Hardware	1
8. On/Off Control	6
9. Proportional Control	7
10. Control Valve Characteristics and Applications.	2
11. Process Control Computer Systems	2
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Laboratory Exercises	30
Interim Tests/Final Examination	5
Review	3