



## MASTER COURSE OUTLINE

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## COURSE TITLE

Instrumentation

## GENERAL COURSE INFORMATION

Dept.: IST

Course Num: 270

(Formerly: )

CIP Code: 15.0404

Intent Code: 21

Program Code: 784

Credits: 5

Total Contact Hrs Per Qtr.: 77

Lecture Hrs: 33

Lab Hrs: 44

Other Hrs:

Distribution Designation:

## COURSE DESCRIPTION (as it will appear in the catalog)

Maintenance procedures and troubleshooting techniques for control/measurement loops in the industrial environment along with fundamentals of control valves, actuators, their applications, techniques of safe trouble shooting, testing, repairing, and calibrating final control elements.

## PREREQUISITES

IST 170 or Instructor Permission

## TEXTBOOK GUIDELINES

Appropriate textbook as determined by faculty (Example: *Industrial Instrumentation* by Al Sutko & Jerry Faulk; Instrumentation Workbook)

## COURSE LEARNING OUTCOMES

*Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills.*

- 1) Define and locate instrumentation problems.
- 2) Demonstrate troubleshooting techniques for control loop equipment.
  - a) Power sources
  - b) Digital controllers
  - c) Input circuitry (including sensor)
  - d) Output circuitry (including final element)
- 3) Select the proper valve and actuator based on:
  - a) Type of fluid
  - b) Temperature of fluid
  - c) Volume of fluid
  - d) Sizing for liquid service
  - e) Sizing for gas service
  - f) Calculation methods.
- 4) Describe the procedure for isolating problems in a pneumatic process control loop.

## INSTITUTIONAL OUTCOMES

## **COURSE CONTENT OUTLINE**

1. Control systems troubleshooting principles
2. Electronic control loops
3. Pneumatic control loops
4. Testing and maintenance procedures for instrumentation
5. Isolating problems for electronic / pneumatic control loops
6. Installation of primary devices and startup of instrument control loops
7. Digital control system testing
8. Documentation
9. Preventive maintenance

## **DEPARTMENTAL GUIDELINES** *(optional)*

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**DIVISION CHAIR APPROVAL**

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**DATE**