

Center for Curriculum and Transfer Articulation



Instrumentation and Control for Maintenance Technicians

Course: **PPT224IC**

Lecture 1 Credit(s) 1 Period(s) 1 Load

First Term: **2013 Summer I**

Course Type: **Occupational**

Final Term: **Current**

Load Formula: **S- Standard**

Description: Operation of various types of radiation detectors, on-line chemistry instrumentation, process measurement systems, and process controls. Instrumentation associated with various plant systems, and troubleshooting and repair methods.

Requisites: Prerequisites: PPT202 or PPT203.

MCCCD Official Course Competencies

1. Explain the principles of operation for various types of radiation detectors. (I)
2. Explain the principles of operation of on-line chemistry instrumentation. (II)
3. Discuss the various process measurements and process controls systems. (III)
4. Explain the instrumentation associated with various plant monitoring systems. (IV)
5. Discuss in detail advanced electronics theory. (V)

MCCCD Official Course Outline

- I. Radiation Detectors
 - A. Geiger-Mueller tube
 - B. Scintillation detectors
 - C. Proportional counter
 - D. Ion chamber
 - E. Fission chamber
 - F. Self-powered neutron detector
- II. Chemistry Instrumentation
 - A. Conductivity analyzers
 - B. Turbidity detectors
 - C. Dissolved oxygen instruments
- III. Process Measurements and Controls
 - A. Pressure
 - B. Temperature
 - C. Flow
 - D. Level
 - E. Vibration
 - F. Loop tuning
 - G. Control fundamentals
- IV. Plant Monitoring Systems

- A. Emergency core cooling systems, including actuation instrumentation
 - B. Extraction steam control systems
 - C. Feedwater control systems
 - D. Neutron monitoring systems
 - E. Radiation monitoring systems
 - F. Reactor protection systems
 - G. Reactivity control instrumentation systems, such as rod control in pressurized water reactors and recirculation flow control in boiling water reactors
 - H. Turbine instrument and control systems
 - I. Engineered safeguards instrumentation systems, such as the containment isolation systems
 - J. Other systems important to plant operations, such as those covered by the technical specifications
- V. Electronics Theory
- A. Operational amplifiers
 - B. Integrated circuits
 - C. Solid state circuitry
 - D. Digital electronics, including the different type of logics used and methods for programming and controlling circuit timing
 - E. Electrical circuit and instrument loop schematics
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Last MCCCD Governing Board Approval Date: **March 26, 2013**

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