



**MORIKUS**  
INDUSTRIAL TRAINING INSTITUTE



COURSES MODULE FOR

**INSTRUMENTATION DESIGN ENGINEERING**

# COURSE OUTLINE



- ❖ Oil & Gas / Chemicals/ Energy & Power industries interaction and Scope.
- ❖ Knowing Client requirements and collection of specific data for projects
- ❖ Relevant Codes & Standards
- ❖ Basic Design requirement based on the type of plant e.g. Chemical
- ❖ Petrochemical, Pharmaceutical Industrial, Power plant etc
- ❖ Preliminary Project design requirements
- ❖ Selection of Instruments for Controlling Flow, Temperature, level and Pressure
- ❖ Preparation of Hookup drawings
- ❖ The various Process Conditions.
- ❖ Vendor's details and specification for all Instruments used to control Flow
- ❖ Level, Temperature and Pressure
- ❖ Installation and maintenance Tips of all Instruments.
- ❖ Preparation Ladder Diagram
- ❖ Detailed Design of Instrumentation systems including Layouts
- ❖ Procurement Requirements
- ❖ Inspection of Equipments/system

# INSTRUMENTATION DESIGN & DETAIL ENGINEERING

## INTRODUCTION TO INSTRUMENTATION DESIGN

- Introduction
- Overview of an Engineering Organization
- Role of a Instrumentation Engineer
- Project Documentation

### BASIC ENGINEERING PACKAGE:

- Overview of Basic Engineering Package.
- Relevant Codes & Standards.
- Basic Design requirement based on the type of plant e.g. chemical,
- Petrochemical, Refinery, and Power Plant etc.

### PROCESS PARAMETERS:

Selection of Instruments for Controlling:

- Flow
- Temperature
- Level
- Pressure.

### DELIVERABLE DOCUMENTS:

- Instrument Index
- Process Data sheets and Specifications
- Instrument Location Plan
- Instrument Air Routing Layout
- Level Sketch
- I/O List
- Instrument Wiring Layout
- Loop Drawing
- JB Layout
- Cable Schedule
- Cable Tray Layout
- Torque Sheet
- Hook-Up

## CONTROL ELEMENT, PROCESS DATA, SIZING AND SPECIFICATIONS

- Introduction to Process Data sheet
- Selection of Control Valve
- Performing Calculations and Sizing of Control Valve
- Viewing and Editing Specification Sheets
- Preparing multi tag data sheets

### SYSTEM DESIGN

- Introduction to wiring
- Technology used for wiring operations
- Junction box, Marshalling rack
- DCS Panel
- Cables
- DCS wiring
- Cross-Wiring the Signals in the Marshalling Rack
- Adding a New Instrument to the Existing Wiring

### INTRODUCTION TO PACKAGES & ANALYZERS

- Introduction of Packages
- Overview of Analyzers
- Project Documentation & Case Studies
- Review of vendor documents
- Procurement details of Instruments and Specification

### ASSIGNMENTS

- To be submitted by Every Candidates
- AutoCAD Practice Sheets for all Relevant Layouts  
Submit Calculation Sheet for orifice, Thermowell,  
Control Valve Submit Instrument Index & Data Sheet



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