

# **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

**CERTIFICATION & PG DIPLOMA COURSES FOR Oil & Gas / Chemicals/  
Energy & Power industries.**

# 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

## Final 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, Marshaling rack  
DCS Panel  
Cables  
DCS wiring  
Cross-Wiring the Signals in the Marshaling 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

**"To enrol please contact [query@meccengineers.com](mailto:query@meccengineers.com)"**

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