

# **COURSES MODULE**

## **For**

# **PIPING DESIGN ENGINEERING**



### **Course Outline**

- ❖ International codes & Standards using for piping system & its components.
- ❖ Plant layouts and work flow procedures
- ❖ Terminology and symbols used in plant layout
- ❖ Plot plans, Equipment Layouts, elevations and 3-D models
- ❖ Principles of chemical process technology
- ❖ Process flow diagrams (PFDs)
- ❖ Equipment used in process plants
- ❖ Instrument symbols and abbreviations
- ❖ Piping and instrumentation diagrams (P&IDs)
- ❖ Piping design and engineering principles
- ❖ Terminology, symbols and abbreviations used in piping design
- ❖ Piping materials
- ❖ Piping specifications and piping codes
- ❖ Components of piping systems - fittings, flanges and valves
- ❖ Piping isometrics and bill of materials

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

# Piping Design & Detail Engineering

## Introduction to Process Plant Layout and Piping Design

Plant layout fundamentals  
Procedures and workflow

## Introduction to Chemical Processing Methods

Unit operations and unit processes  
Process flow diagrams (PFDs) & Piping & Inst. Diagrams (P&IDs)  
Typical equipment specifications

## Fundamentals of Pipe and Pipe Fittings

Pipe dimensions and pipe representation  
Use of pipe data tables  
Material Specification  
Pipe joining methods  
Pipe fittings  
Fitting dimensions and tables

## Piping System Components

Basics of flanges  
Flange ratings and flange types  
Flange data tables and their use  
Different types of valves and their applications  
Valve data tables  
Piping restraints  
Supports, anchors and guides

## ASME/ANSI Codes & Standards

Introduction to B31.3 process piping codes  
ASME standards for Common Piping Elements.  
Piping specifications & Material selection

## Pipe Hydraulics & Sizing

Flow rate, velocity, pipe sizing calculations  
Reynolds number- laminar/turbulent flow  
Darcy Weisbach & Hazen William equations  
pressure drop calculations, NPSH calculations

## Plant Layout and Plot Plans

Plant layout specifications  
Codes and safety considerations  
Development of plot plans  
Plot plan use by disciplines  
Sample plot plans and equipment arrangement drawings  
Layout case studies

## Equipments Used in Process Plants

Process equipment: Reactor Tower, Exchanger Furnace, Vessel, Column  
Mechanical equipment: Pumps, Compressors, Storage tanks  
Equipment foundations and supports  
Equipment data sheets, Equipment sketches & Equipment drawings  
Equipment nozzle specifications

## Insulation & Heat Tracing

Insulation & Preparing an Insulation Specification  
Data required to prepare Insulation Specification  
Heat Tracing

## Piping Isometrics

Piping Isometrics Drawings  
Isometric Dimensions, Notes & Callouts  
Isometric Offsets & Print Reading Exercises  
Exercises on creation of Isometrics from plans and Sections

## Pipe Supports

Classification of Supports & Pipe Arrangements  
Anchors, Pipe Guides, Limit Stops, Pipe Shoe  
Dummy Leg, Trunion  
Field Support, Base Support  
Rigid Hanger, Rod & Clevis, Flexible Hangers, Variable & Constant  
Pipe Rack Design Types, Height & Width Calculations

## Piping Materials and Material Specifications

Material properties & Classification of materials  
Material specifications (as per ASTM)  
Common piping materials & Piping specifications  
Material selection, Material testing, inspection and QA

“To enrol please contact [query@meccengineers.com](mailto:query@meccengineers.com)”

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