



MORIKUS
INDUSTRIAL TRAINING INSTITUTE



COURSES MODULE FOR

PIPING PLANT DESIGN & DETAILED 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

PIPING PLANT DESIGN DETAIL ENGINEERING

INTRODUCTION TO PROCESS PLANT LAYOUT AND PIPING DESIGN

- Plant layout fundamentals
- Procedures and workflow

ESTIMATION OF PLANT ELECTRICAL LOAD

- 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
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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



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