Engineers 3D
IT & ENGINEERING SERVICES
TRAINING PROJECTS PLACEMEMNTS

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Syllabus of Engineers 3D Piping Design and Engineering

Module-1 Piping Design and Engineering (fundamentals)

- Introduction to piping designing & engineering
- Evolution of piping
- Manufacturing methods
- Piping materials and selection
- Pipe dimensioning
- Schedule numbers
- Common piping abbreviations
- Major organizations for standards
- Commonly American code in piping ASME/ANSI
- Common abbreviations etc

Module-2 Basic Piping components required

- Type of Fittings - elbows, weld tee, stub in, couplings, reducers, weld cap, screwed and socket welded fittings, Pipe nipples, flanged fittings and use of fittings
- Type Flange -Types, P-T ratings and facings.
- Gaskets, bolts and nuts.
- Major Valves - Types, Materials operations, applicability, codes and specifications.

Module-3 Piping Equipment

- Horizontal vessels/accumulators
- fractionation columns, pumps
- heat exchangers
- re-boiler
- air cooled heat exchanger
- cooling towers
- heaters/boilers
- storage tanks
- fractional distillation process and vendor data drawings
- Prepare layout of Different type lights

Module-4 Piping Engineering flow diagram and its concept

- Uses of flow diagrams, process flow diagrams
- mechanical flow diagrams, utility flow diagrams
- piping symbols
- line symbols
- valve symbols
- piping isometrics
- general arrangement drawings- sections/elevations/ detail drawings
- plot plan procedures

Module-5 Process system

- Purpose of P&ID'S
- study of P&ID'S
- stages of development of P&ID'S
- process and instrumentation diagrams
- process equipments
- symbols usage according to industrial practices
- Purpose of P&ID in process industrial/plants.

Module-6 Basic knowledge of applicable standards

- ASME/ANSI Codes & Specification
- Specification classes
- Piping abbreviations
- General abbreviations

Module-7 Designing & engineering of Piping Diagram in software

- Plant Co-ordinate Systems
- Site Plans, Unit Plot Plan
- Equipment Location Drawing
- Foundation Location Drawing
- Pipe Rack Spacing
- Drawing pipe in the rack
- pipe insulation shoes, pipe guides
- field supports, dummy supports
- hanger rods
- spring hangers
- pick-up pipe supports
- plant utilities
- control valve manifolds
- utility stations
- sewer and under ground piping system

Module-8 ASME Engineering

- Pipe wall thickness calculations
- operating pressure
- design pressure
- operating & design temperature
- max allowable operating pressure

Module-9 ASME pressure design

- Pipe, elbows
- mitre bends
- reinforcement pad calculation for branch connections
- flanges
- blanks
- reducers
- expansion joints and gaskets

Software Designing:

- AutoCAD : Drawing Creation (P&ID, PFD, Layouts, and all fabrication Drawings)
- PIPE STRESS ANALYSIS
- Introduction to Pipe Stress Analysis.
- Stress- Strain relationship, analysis like- why piping components fail.
- Classification of loads- sustained load & occasional load.

Requirements of ASME B31.3 code for process piping, stress intensification factors, thermal analysis using Kellogg charts.

- Piping stress, causes, impacts, stress categories like- thermal stress, longitudinal stress, hoop stress and allowable stresses.
- PLANT DESIGN MANAGMENET SYSTEM (PDMS) :
- Equipment Modeling.
- Pipe Routing.
- Equipment Modeling.