

PIPING DESIGN ENGINEERING

Design | Engineering | Construction | Maintenance

A robust course for Mechanical Engineers with sufficient depth in a specific area of **Piping Design Engineering** to solve complex real world engineering problem and to understand engineering trade-off and contribute effectively in multi disciplinary project with informed decision making.



SMARTBRAINS ENGINEERS & TECHNOLOGIST PVT. LTD.

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About the Program?

The objective of this course is to provide the candidates the Detail knowledge and skills in Piping Design discipline to facilitate faster learning curves while on the job.

The objective of this course is to provide basic knowledge and skills in this discipline of Piping Engineering for Oil & Gas sector. This course will cover the fundamental principles and concepts used in Process Plant Layout and Piping Design Engineering. Upon completion of this course, students will have a clear understanding of the design and principles used in Piping Design System for Oil & Gas Energy Sector.

The objective of this course is to provide delegates the Detail knowledge and skills into Design, Engineering, Construction, Commissioning operation & Maintenance in the field of Piping Engineering for Oil & Energy Sector.

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Learning Objective

- Plant layout fundamentals and work flow procedures
- Process Plant Industry Overview & Basic Concepts
- Production Facilities
- Engineering, Procurement and Construction
- Cost Estimation
- Fundamentals of pipe and pipe Fittings: Standards, Selection, Application, Drawing Symbols & Dimensioning
- Piping system components: standards, selection, application, drawing symbol & dimensioning
- Piping System Design (Codes & standards)
- Process Plant layout: Piping Design & Drafting
- Plant Layout: 3D Modeling-Plant Design Management System (PDMS)
- Equipment Modeling
- Pipe Design
- Draft
- ISO Draft

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Methodology

SmartBrains Engineers Technologist Pvt. Ltd. uses mixes of techniques aligned to a unique pedagogy which is Goal-Centric & Action Oriented. Demonstrates Case Studies using the statistical tools, exercises & brainstorming using Adaptive Probing Methodology along with classroom theories and live Project exposure. Delivered by Senior Industry Professionals having extensive experience in their core domain.

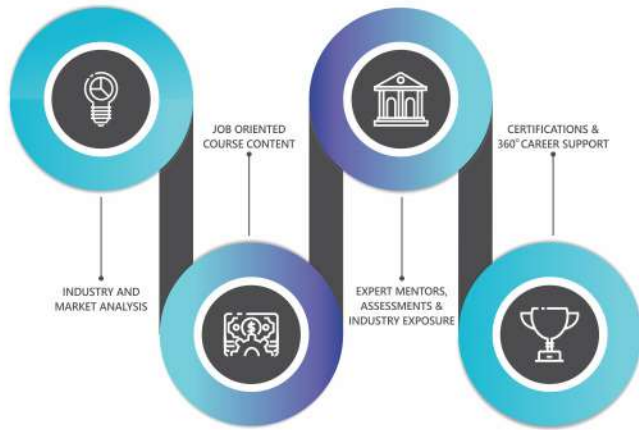
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Career Benefits

- **Become Eligible** for Design & Engineering jobs in to electrical Engineering demanding background.
- Open doors to **Job Opportunities Abroad** demanding specialization.
- Fill the void of thousands of untapped **High-Paying Jobs** in Design Engineering with **Talent Shortage**.
- **Get Promoted** in your current profile with most in-demand skill.
- Distinguish your profile from peers during **Job Interviews**.
- Earn a **Rewarding Global Certification** Certified by (National Skill Development Corporation of India (NSDC), Under the Ministry of Skill Development and Entrepreneurship (Govt. of India) Training & Certification Program.
- **Improve your CV & LinkedIn Profile** with professional development.



- The program is a global standard offering that uses mixes of techniques aligned to a unique pedagogy which is Goal-Centric & Action Oriented.
- Includes classroom theory, learning videos, demonstration of statistical tools like Advanced Excel Programs and Other Software tools.
- Real-project case studies using the statistical tools demonstrated, exercises and brainstorming using adaptive probing methodology.



Program Highlights



Assessment



Byte Size Learning



Assignments



Projects



Industry Interaction



360° Career Support



Case Study



Discussion Forum

SmartBrains engineers and technologist Pvt. Ltd. has received recognition, endorsement and affiliation from National Skill Development Corporation of India (NSDC), a Public Private Partnership (PPP), Under the Ministry of Skill Development and Entrepreneurship (Govt. of India) and various Skill Sector Councils as an authorized training partner under various trades. SmartBrains is authorized to provide skill based training for engineering/non-engineering candidates as per their interest. SmartBrains as a training institute will provide complete practical knowledge based skill training to the candidates and NSDC/Skill Councils will be responsible for providing recognition & certification to the candidates. The National Skill Development Corporation (NSDC) is one of its kind, Public Private Partnership Under the Ministry of Skill Development and Entrepreneurship (Govt. of India) aims to promote skill development by catalyzing creation of large, quality and for-profit vocational institutions. Further, the organisation provides funding to build scalable and profitable vocational training initiatives. Its mandate is also to enable support system which focuses on quality assurance, information systems and train the trainer academies either directly or through partnerships. NSDC acts as a catalyst in skill development by providing funding to enterprises, companies and organizations that provide skill training. It also develops appropriate models to enhance, support and coordinate private sector initiatives. The differentiated focus on 21 sectors under NSDC's purview and its understanding of their viability will make every sector attractive to private investment.



MODE/DURATION

- Fast Track - 16 Days
- Weekend - 3 Months
- Online - 3 Months
- Regular - 2 Months

LEARNING BASED OUTCOMES

Get hands-on experience in applying design tools & techniques to real engineering problems and understand Design, Engineering, Construction, O & M etc. Thus, become a Technology Driven Engineering Professional.

TRAINER

Delivered by Senior Industry Professionals having extensive experience of Design & Engineering in diverse domains & industries. These practitioners are also Empanelled as subject matter experts with SmartBrains Engineers & Technologist Pvt. Ltd.

CONTENT

Get 24 x 7 access to SmartBrains LMS platform (Online/Offline) with Abundant Content on Piping Design Engineering including Courseware (PPT / PDF), data, case studies, articles, books, videos, examples, presentations, resource library & related more.

JOB ORIENTED OUTCOMES

Fill the Void of Talent Shortage in Design Engineering by becoming eligible for thousands of High Paying Jobs in India & Abroad with an upgraded profile through this skill & certification. Additionally, Get Promoted from your current position with added skill set.

Become eligible for Piping Design Engineering job demanding background

Explore + Analyse + Solve Engineering Problems using Analytics Tools & Design Software

Fill the void of thousands of untapped High-Paying Jobs in Piping Design Engineering

Helps understand Engineering Procurement and construction (EPC) contracts.

Distinguish your professional profile from peer during Job Interviews and stand out of the box

Understand 'What' & 'How' aspects of Piping Design Engineering

Perform exercises by accessing our labs and simulation software

Improve your Curriculum Vitae and your social job profile with professional development

Support your startup or your professional life with high hike

Build a startup in one of the most rewarding fields of Piping Design Engineering

1. Process Plant Industry

- **Overview & Basic Concepts**
 - Meaning of Process Plant Industry
 - Typical Process Plant & Power Plant Industry objectives
 - Typical Process Plant & Power Plant Industry activities
 - Industry Streams
 - Typical Organization chart
 - Company Structure
- **Production Facilities**
 - Typical Production Facilities.
 - Artificial Systems.
 - Treatment and Processing
 - Product and Processing
 - Typical value chain
 - Value Products
- **Engineering, Procurement and Construction**
 - EPC Overview
 - Risk allocation on EPC Contract
 - Choosing EPC control compared to other forms of contact
 - Bankability of EPC contract.
 - Various entities and other project documents
 - Different mode of contract
 - Contract Jargon: Lump sum, turnkey, EPCM, EPCC, Cost-plus, reimbursable.

2. Fundamentals of Pipe and Pipe Fittings : Standards, Selection, Application, Drawing Symbols & Dimensioning

- Definition and application of pipe
- Pipe designators-IPS, NPS, NB/DN
- Pipe wall thickness- schedule number, pipe weight.
- Pipe- lengths, ends, joining method, manufacturing methods.
- Pipe symbol
 - Pipe Fitting
 - Elbow
 - Tees
 - Reducer
 - Coupling
 - End caps
 - Fitting dimensions and tables

3. Piping system components: standard, selection, application, drawing symbol & dimensioning

- Flange, Gaskets, and Bolting:-

- Introduction
- Valve Function and applications
- Valve Types
- Valve stem packing
- Valve selection procedure
- Valve inspection and testing

• Pipe hangers and supports:-

- Classification of supports
- Anchors, pipe guides, limit stops
- Pipe shoe dummy leg/trunion
- Field support/base support
- Rigid hanger rod & clevis, Trapeze.
- Flexible hanger variable & constant.
- Pipe rack design type, height and width calculations

• Pipe manufacturing processes and Material Selection:-

- Introduction
- Pipe manufacturing processes
- Application standard for pipe and piping

• System Component

- Material Selection Considerations
- Piping Specification
- Piping System Design (Codes & standards)

4. Piping System Design (Codes & standards)

• Overview of piping codes & standards

- Process plant piping and ASME B31.3
- Liquid transportation piping and ASME B31.4
- Gas transmission piping and ASME B31.8
- General comparison of ASME B31.3, B31.4 and B31.8

• Piping material and material specifications

- Material properties
- Classification of materials
- Material specification (ASTM)
- Common piping materials

• Pressure Design of Pipe and Piping System component

- Introduction
- Straight pipe

- Curved Selection
- Branch Connection
- Pressure Rating of Piping fittings
- **Pipe Hydraulic & Line sizing**
 - Flow rate, velocity, pipe sizing calculations
 - Reynolds number laminar / turbulent flow
 - Darcy weisbach & hazen William Equations
 - Pressure drop calculations, NPSH calculations
- **Piping System Studies**
 - Drum piping, pump piping, compressor piping, heat exchanger piping, column piping, tank farm piping, underground piping, pipe rack piping. Process Plant layout: Piping Design & Drafting

5. Process Plant layout: Piping Design & Drafting (Drawing and Documentation)

- **Flow Diagrams**
 - Block flow diagrams-BFD
 - Process Flow Diagram-PFD
 - Utility flow Diagram-UFD
 - Piping & Instrumentation Diagram
 - P & ID.
 - Line Numbering
 - Line Number Requirements
 - Instrument types & symbols
 - Flow, Temperature, Pressure & level
- **Plant layouts: Piping Layouts**
 - Equipment lists
 - Piping line lists
 - Piping Plan Development
 - Preparing Piping Layout Drawings by placing instruments, valves etc.
 - Rack Piping
 - Pipe rack spacing, drawing pipe in the rack etc.
- **Equipment Layouts**
 - Equipment data sheets
 - Equipment foundations and supports
 - Equipment sketches
 - Equipment drawings
 - Equipment nozzle specifications
 - Equipment foundation drawing
- **Piping Isometrics**
 - Definition
 - Piping Isometric Drawing
 - Isometric Dimensions, Notes & Callouts
 - Isometric offsets, Print Reading Exercises
 - Exercises on creation of isometric form
 - Piping plan & Sections

- **Piping Spools**
 - Definition
 - Types of spool Drawings
 - Guidelines to Prepare Spool Drawings
 - Print Reading Exercises
 - Exercises on creation of piping spool from piping isometric
 - MTO (Material Take off): Types and applications

6. Plant Layout: 3D Modeling- Plant Design Management System (PDMS)

- **Equipment Modeling**
 - Creating equipment by using primitives.
 - Creating Equipment by using PDMS standards catalogue.
 - Creating Obstructions
 - Manipulation of primitives & equipment
 - Nozzle placement and manipulations
 - Understanding parameters & attributes
 - DB Utility
- **Pipe Design**
 - Pipe & Branch creations
 - Pipe routing & slope piping
 - Manipulating Pipe components & assemblies
 - Checking Data consistency
 - Checking & rectifying classes
 - Locating Support & Deciding Support span
 - Generating text report like line & support lists
- **Draft**
 - Preparing Layout by using Draft Modules
 - Creation Views
 - Animations & Dimensioning
- **ISO Draft**
 - Extracting isometrics
 - Preparing isometrics for fabrication & erection.

Prospect Recruiters



Course Certificates

SmartBrains is associated with The National Skill Development Corporation (NSDC) as the Training and Certification partner for various job oriented training programs across various sectors including Oil & Gas, Power, Renewable Energy, Hydrocarbon, IT & ITs, Electronics, Telecom, Agriculture, Life science etc. offering assessment based Training & certifications for a gamut of job profile.

Who should join?

- Working professionals in **Domains:** Site Engineering, Construction & Commissioning operation & Maintenance, Technicians in Piping Engineering Field.
- Students (**Mechanical Engineering, Diploma in Mechanical Engineering**) who want to develop their career in Design Engineering.



Global Certification

For facilitating corporation among government, Industry & academia to validate skill-sets & respective domain knowledge, SmartBrains offers various Global Certification. It helps in employability, Improving C.V's, Professional development & setting-up Start-ups or business.

SmartBrains is knowledge based multi-disciplinary organization with the work scope of whole life cycle for Engineering Consulting, Technology Services, Human resource outsourcing, Skill Development and Vocational Training Company, committed towards bringing an entire range of services for various sectors into most of business functions. Organization founded in 1998, combine deep industry experience, technical expertise and a global delivery model to create value-based solutions to fulfill industries requirements, success has been built upon the unstinted support and relationships with its partners and the patronage of its clients from across the Globe. SmartBrains has received recognition, endorsement and affiliation from National Skill Development Corporation of India (NSDC), a Public Private Partnership (PPP) , Under the Ministry of Skill Development and Entrepreneurship (Govt. of India Enterprises) & various Skill Sector Councils as an authorized training partner under various trades.

SmartBrains is the global market leader in providing high-level training services to the Oil and Gas sector, Petrochemical, Refinery, LNG, Power Plants, Fiscal, Contracts, Strategy, Process Engineering, Piping Engineering, Electrical Engineering, Instrumentation Design, Plant Equipments, Civil and Structural Engineering, HVAC, Project Management, HSE, Financial and Risk Management. Operating nation wise over the last 8 years, our courses are widely acknowledged within the energy community for quality and up-to-date information. Our success and distinguished reputation is down to our commitment to the industry, a high-level of expertise, sector knowledge, cultural diversity and experience that comes from organizing many courses.

Our other Mechanical Engineering Courses

- CNC Machining Technology
- HVAC Design for Pharmaceutical Facilities
- HVAC Tips for Green Building
- HVAC Design for Oil & Gas Facilities
- Air Compressors - Basic Concept and Application
- Commissioning Mechanical Systems
- Pneumatic Conveying Systems
- Introduction to Hydraulic System
- Refrigeration Chiller System - Technology, Design & Engineering
- Introduction to Fans and Fan System
- Cooling Water System - An overview of Cooling Towers
- Piping System - Design, Construction, Maintenance

For Corporate queries

A-25, Sector - 59,
Noida (UP), INDIA
Pin Code - 201301

Connect with Program Advisor

training@smartbrains.com
+91 89555 60560 | +91 98911 08700
www.smartbrains.com

Nodal Centers

Hyderabad, Dehradun,
Guwahati, Vadodara,
Pune

