Since 2002

SANJARY EDUCATIONAL ACADEMY®

Society Registered, No. 347 / 08, Government of Telangana

Registered with Ministry of Commerce & Industry, Directorate General of Foreign Trade, Govt. of India.

Registered with Ministry of Micro, Small & Medium Enterprises, Government of India,

Member of Indo-American Chamber of Commerce (IACC)

Member of Federation of Telangana and Andhra Pradesh Chambers of Commerce and Industries (FTAPCCI)

ISO 9001 : 2015 Certified

Head Officer : S.N0. 24 & 25 , 3rd Floor , SANALI MALL , above Mcdonalds , Opp. Chermas Show room , Abid , Hyderabad , Telangana , India . phone :+91- 40- 65268809 / 9985715560

Register Office : 20 – 3 – 144 / 9 , Shibli Gunj , Hyderabad , Telangana , India

TRAINING AND CERTIFICATION
TO
ENGINEERS / INDIVIDUALS

M/s Sanjary Educational Academy is developing skill in Piping Design and certifying Piping Design Engineer more than DECADE

All certification courses including Piping Design Engineer which is Design & Developed by Sanjary Educational Academy in line with International Standards ,Industrial job , Sanjary (SEA) Norms etc.

All Piping Design Engineer courses cover the comprehensive competency and developing skills aspect of the Piping Design & Engineering which allows to adapt to study of Piping Design Software

Each year thousands of professional Engineers / Individuals enroll in the piping design engineer courses offered by Sanjary Educational Academy .This is one of the most widely recognized and accepted qualification in the industry world wide.

Sanjary Educational Academy has Completed Over 100 + Batches of Piping Design Engineer , Professionals Certification Courses form 2008 to December 2016.

International Certificate – Certificate is Recognized International in more than 25 Countries

Certification Course

- ***P G DIPLOMA IN PIPING DESIGN ENGINEERING***

Eligibility Criteria : **Mechanical Engineer , Chemical Engineer & Petroleum Engineer**

Duration of Course : **2 Months (150 Hrs) – India**

Course Cover up :-
- **Basic ,**
- **Piping Design**
- **Process Engineering**
- **Piping Engineering ,**
- **Layout Engineering**
- **Pipe Stress Analysis etc. ,**

Software : **- Study of CEASAR II**

- Study of PDMS

Course Fee : **Rs 33000/- Hyderabad , India**

Course Fee for Foreign Students : **US Dollar $ 1300/- Hyderabad , India**

Daily Classes : **First 15 Days : 2 hrs / day**

Second 15 days : 3 hrs / day

Third & Fourth 15 days : 4 hrs / day

Venue : **SANJARY EDUCATIONAL ACADEMY ,**
HEAD OFFICE: 5-9-233 / 234 , S. No. 24 & 25 , 3rd Floor, SANALI MALL Opposite Chermas Showroom , Abids , Hyderabad - 500001, Telangana , India

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Duration of Course : **45 (150 Hrs) USA , Saudi Arabia , Dubai , Qatar**

Course Fee : **US Dollar $ 1300/ -USA , Saudi Arabia , Dubai , Qatar**

Daily Classes : **Three Hours Per Day**

Maximum No. of Seats / students in a Batch : **15 only**

Overview:

This comprehensive course which provides a systematic development of skills and knowledge of Piping Design Engineer in line with international standards including ASME B31.1 , ASME B31.3, Industrial job and Sanjary (SEA) Norms etc.

This certification course is design and developed by Sanjary Educational Academy. A comprehensive course covering in depth the design of various pressure piping systems including Basic , Piping Design , Piping Engineering , Piping Layout Pipe Stress Analysis ,detailed design and engineering etc. Study of PDMS,& study of CEASAR II ,

This course also provides design projects per ASME B 31. This course is more concentrated on manual design calculation of piping sizing, pressure integrity , pipe stress analysis , pipe support ,pump calculation and as well as study of CAESAR II ,& study of PDMS including piping isometric ,process flow diagram (PFD) ,piping &instrumentation diagram (P&ID), equipment layout ,piping arrangement , selection of material etc. and Submission of Piping Design Project Report as per ASME B31.

This course in directed primarily to meet the needs of various industries, Engineering Consultants / EPC ,Manufacturing Industries and Govt. & private social sectors including Oil & Gas, Petrochemical, Refinery, Power Plant, Pharmaceutical, Textiles Industries and Waste Water Treatment Plant and any type and size of organization. Candidates shall meet the following examination requirements to be considered for certification as

Certification Ceriteria :

Candidates shall meet the following examination requirements to be considered for certification as Certified Piping Design Engineer. Pass a written three part examination as follows.

Part 1 Theory Examination

Part 2 Workshop / Assessment

Part 3 Oral Examination

Candidate shall pass each part of the examination. Individual failing any part of the above examination must retest on particular part as applicable.

Candidate must score minimum of 70 percent on each of the above examination to be eligible for the certificate and SEA Qualification Card.

Note : Certificate , Marks Sheet and Qualification Card will be awarded to the candidate after successful completion of course & examination.

Course Syllabus :

PART - 1

- **PIPING SYSTEMS DETAILED ENGINEERING**
- **LAYOUT OF PIPING SYSTEMS & PIPING DRAFTING**
- **MECHANICAL AND PROCESS EQUIPMENT**

Module – 1 Fundamentals of piping

Module – 2 ASME codes and standards

Module – 3 Classification of pipe

Module – 4 Piping Material Specifications – ASME / ASTM

Module – 5 Calculation of standards property of piping materials

Module – 6 Pipe Fittings

Module – 7 Types of Flanges

Module – 8 Types of Valves

Module – 9 Mechanical and Process Equipment

Module –10 Flow Diagrams

Module – 11 Piping Isometric

Module – 12 Piping and Equipment Layout

Module – 13 Pipe Supports

PART - 2

- **PIPING SYSTEMS DESIGN**

Module – 14 Design of process piping requirements per ASME B31.3

Module – 15 Design pressure integrity

Module – 16 Typical wall thickness calculation for Oil and Gas , Petrochemical , Refineries (eg. Saudi Aramco)

Module – 17 Hydraulic Design of Piping Systems

Module – 18 Design Calculations of Piping sizing

Module – 19 Pump Calculations

PART - 3

- **PIPE STRESS ANALYSIS**

Module – 20 Introduction

Module – 21 Stresses due to Sustained Loads , Stresses due to Displacement Strains and Stresses due to Occasional Loads

Module – 22 Pipe Flexibility Analysis per ASME B31.3

Module – 23 Design Calculation of Pipe Stresses by Thermal Expansion Stress / Sustained Loads

Module – 24 Design Calculations of Occasional Loads

Module – 25 Design Calculations of Wind Load on a Piping Support in Open Terrain

Module – 26 Determination types of Pipe Support and Maximum Allowable Span

PART- 4

- **Study of CAESAR II**

PART- 5

- **Study of PDMS**

DETAILED COURSE SYLLABUS–OUTLINE

PART - 1

- **PIPING DESIGN SYSTEMS DETAILED ENGINEERING**
- **LAYOUT OF PIPING SYSTEMS & PIPING DRAFTING**
- **MECHANICAL AND PROCESS EQUIPMENT**

Module – 1 Fundamentals of piping

- Definition and Application of Piping
- Pipe Manufacturing
- Pipe Fabrication
- Pipe Designations

Module – 2 ASME codes and standards

- ASME Boiler and Pressure vessels Codes
- ASME Pressure Piping Design Codes.
- API Codes
- Other Codes & Standards

Module – 3 Classification of pipe

- Manufacturing Methods
- Weight and Size – Standards STD , Extra Strong XS , Double Extra Strong XXS etc.
- Applications or Uses
- Pressure Temperature Rating System

Module – 4 Piping Material Specifications – ASME / ASTM

- Ferrous Material Specifications
- Non Ferrous Material Specifications

Module – 5 Calculation of Sandards Properties of Commercial Piping Materials

- Several Examples of Calculation of Standards Properties of Commercial Piping Materials

Module – 6 Pipe Fittings

- Types of Fitting - Butt Weld , Threaded and Socket Weld
- _ Elbow – 90 degree (LR & SR), 45 degree, Reducing Ell. ,
- _ Branch Connections – Straight & Out let Tees
- Reducers – Concentric & Eccentric, Reducer Offsets.
- Fabricated Branch Connections – Stub In & Stub On,
- Branch Reinforcements – Reinforcing Pad, Welding Saddle Olets.
- _ Olet Fittings – Weldolets, Sockolets, Threadolets, Latrolets, Elbolets

Module – 7 Types of Flanges

- Definition of Flange.
- Types of Flanges based on Face and Application,-. Forged Steel and Cast Iron Flanges.
- Threaded Flanges , Slip-on Flanges, Socket-Welded Flanges , Welded-Neck Flanges , Blind Flanges
- Gaskets – Types, Thickness, Bolts & Nuts.

Module – 8 Types of Valves

- Definition & basic function
- Valve Types – Gate, Globe, Ball, Check, Butterfly, Angle, PRV/PSV, & Plug , Automatic Control , Needle , Diaphragm , Safety ”Pop
- Application of Check Valve

- Valve Storage Procedure
- Valve Testing
- Control Valve Manifold. – Layout Representation & Requirements.

Module – 9 Mechanical and Process Equipment

- Static Equipment – Horizontal Vessels, Vertical Vessels, Storage Tanks, Heat Exchanger , Reboiler., Towers and Columns
- Rotary Equipment – Pumps, Compressor, Fans, & Steam Turbines.

Module – 10 Flow Diagrams

- Process Flow Diagram – PFD
- Piping & Instrumentation Diagram – P & ID.
- Utility Flow Diagram
- Line Numbering
- P& ID Requirements
- Flow Diagram Exercises.
- Symbols & Abbreviations.
- Instrument Types & Symbols – Flow, Temp, and Pressure & Level.
- Flow Plan arrangement etc.

Module – 11 Piping Isometric

- Definition
- Drawing Piping Isometrics
- Isometric Dimensions, Notes & Callouts.
- Isometric Offsets.
- Exercises on Creation of Isometrics form Piping Plans and Sections.

Module – 12 Piping and Equipment Layout – (Plot Plan, Equipment Layout, & Piping GA Drawings)

- Plot Plan Development & Requirements.
- Equipment Layout Terminology, Control Point & Battery Limits
- Preparation of Equipment Layout.

- Piping GA Drawing Requirements and Layout Procedure.
- Pump GA Drawing and Layout Consideration.
- Tank & Vessel Layout Consideration .etc.

Module – 13 Pipe Supports

- Types and Functions of Supports
- Anchors
- Pipe Guides
- Limit Stops
- Pipe Shoe
- Dummy Leg / Trunion
- Field Support / Base Support
- Rigid Hangers
- Flexible or Resilient Supports - Variable & Constant Load
- Pipe Rack and Yard Piping Design

PART - 2

➢ PIPING SYSTEMS DESIGN AND CALCULATIONS

Module – 14 Design of process piping requirements per ASME B31.3

- Scope of ASME B 31.3, B31.1
- Design Pressure & Design Temperature for Piping Systems.
- Ratings of Flanges etc.
- Reinforcement of Branch Connection

Module – 15 Design pressure integrity

- Concept of Pressure Integrity
- Pressure Design of Straight Pipe under Internal Pressure. – Wall thickness Calculations

Module – 16 Typical wall thickness calculation for Oil and Gas , Petrochemical , Refineries (eg. Saudi Aramco)

- ***Several Examples of wall thickness calculation for Oil and Gas , Petrochemical , Refineries (eg. Saudi Aramco)***

Module – 17 Hydraulic Design of Piping Systems

- Fluid Flow Sizing
- Pipe Sizing
- Recommended Velocities for Water and Steam Piping etc.
- Reynolds Number
- Types of Flow in Piping
- Pressure Drop due to Friction / viscosity
- Darcy Weisbach Equation
- Friction Factor
- Moody Diagram
- Minor Losses in Piping – Equivalent Length Method & Loss Coefficient Method

Module – 18 Design Calculations of Piping sizing

- ***Several Examples of Calculation of Pipe Sizing***

Module – 19 Pump Calculations

- Head
- Section and Flooded Lift
- Velocity Head
- Total Dynamic Section Head , Total Dynamic Discharge Head , Total Systems Head
- Cavitation in Pumps
- NPSH Required & NPSH Available for Pumps.
- ***Several Examples of Design of Pump Calculation*s**

PART - 3

- **PIPE STRESS ANALYSIS**

Module – 20 Introduction

- Objectives & Definition of Stress Analysis
- Critical Line List

- Information Required for Stress Analysis
- Piping Loads – Static & Dynamic
- Requirements of ASME B 31.3 Code – Sustained Loads, ThermalExpansion & Occasional Loads.

Module – 21 Stresses due to Sustained Loads , Stresses due to Displacement Strainsand Stresses due to Occasional Loads

- Longitudinal Stress,
- Longitudinal Stress from Pressure
- Longitudinal stress due to weight
- Allowable Displacement Stress range
- Basic Allowable Stress at maximum material temperature.

Module – 22 Pipe Flexibility Analysis per ASME B31.3

- Pipe Stress Analysis Logic
- Minimum Flexibility Requirements
- Stress Range Reduction Factor - f
- Piping Flexibility – General Consideration
- Stress Analysis Flexibility Requirements
- Stress Analysist's Function
- Scope of Code Requirements

Module – 23 Design Calculation of Pipe Stresses by Thermal Expansion Stress / Sustained Loads

- Several Examples of Design Calculation of Pipe Stresses by Thermal Expansion Stress / Sustained Loads

Module – 24 Design Calculations of Occasional Loads

- ***Several Examples of Design Calculation of Occasional Load***

Module – 25 Design Calculations of Wind Load on a Piping Support in Open Terrain

- Calculating Civil / Mechanical Load on Pipe Systems

- Hydrostatic Test Weight
- Wind Force
- Wind Shielding
- ***Several Examples of Calculations of Wind Load on a Piping Support in Open Terrain***

Module – 26 Determination types of Pipe Support and Maximum Allowable Span

- Maximum Support Spacing Based on Weight , Deflection Criteria and Design Loads
- Suggested Pipe Support Spacing
- ***Several Examples of Types of Support and Maximum Allowable Span***

PART- 4

- **Study of CAESAR II**

PART- 5

- **Study of PDMS**

Note : Certificate , Marks Sheet will be awarded to the students / candidate after successful completion of course & examination.

Please register prior to the above course commencement date.

Note:

1. Course Fees includes the course materials (Hard Copy only) , Resources Materials , Standard Forms / Templates for reference , Training, examination and certification.
2. Students / Engineers admission procedure will be Document No. SEA HYD TS -01 for enrolling the admission of courses
3. Certificate, Mark Sheet and Qualification Card will be awarded to engineer after successfully completion of course & examination.

Sanjary Educational Academy legally established in the year 2002. Sanjary Educational Academy is a Society Registered No. 347/08 by Government of Telangana , India . Undertaking high quality of training , certification to Engineers and Individuals , solution and time to time achieve higher level of educational values in various sectors including oil & gas , petrochemicals , refineries , power energies , construction projects etc in the field of Piping Design , Piping Engineering , QA QC, QMS , Industrial Safety (HSE) , Welding Technology etc.

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Sanjary Educational Academy an ISO 9001:2015 Certified for Design & Development of Courses in Piping Design , Piping Engineering , Pressure Vessel design , QA, QC, QMS, Industrial Safety (HSE), Information Technology (IT), Integrated management System (IMS), Welding Inspector , Piping Inspector and Training, Examination & Certification,

NATIONAL & INTERNATIONAL AWARDS WINERS

SANJARY EDUATIONAL ACADEMY Awarded The Most Prestige's

"Indian Achievers Award for Quality Excellence"
, August 5 , 2010, New Delhi.

"Indira Gandhi Excellence Award for Education Excellence "
December 21 , 2014 , New Delhi

"International Achievers Award for Education Excellence "
August 27 , 2010, Bangkok.

"BEST PERFORMANCE AWARD FOR EXCELLENCE IN SOCIAL & EDUCATION"
August 10, 2015, New Delhi, India

Mr. Mohammed Saleem – SEA President Awarded The Most Prestiges National Awards

" RASHTRIYA GAURAV AWARD "
October 1 , 2016 , New Delhi , India

"BHARAT JYOTI AWARD "
January 7, 2006 , Hyderabad , India

" BHARAT SHIKSHA RATAN AWARD "
August 10 , 2015 , New Delhi , India

SEA certification is accepted and recognized by major National & International companies in the world including India , Saudi Arabia , UAE , Kuwait , Qatar , Bahrain , Oman , Jordan , Iraq , Iran , Yemen , Nigeria , Sudan , Libya , Turkey Portugal, Cameroon, Vitenum , Congo & other countries. Our SEA certified Engineers are already working in the above said countries.

SEA has trained & certified more than 5000 Engineers & Individuals in last five (5) years in different engineering disciplines and various sectors which include Oil and Gas , Petrochemicals , Refineries , Power Plant , Aeronautics & Construction projects etc.

M/s Sanjary Educational Academy has organized various National & International Conferences and Seminars in India & Abroad on Piping Design and Engineering , QA / QC , Safety (HSE) , Welding Technology etc in the field of Oil and Gas , petrochemicals and power Plant Industries.

For any further details pls do not hesitate to contact us at

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Hyderabad - 500001, Telangana , India

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