

# SANJARY EDUCATIONAL ACADEMY<sup>®</sup>

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

Registered with Ministry of Commerce & Industry, Director General of Foreign Trade, Government of India.

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

Member of Indo - Arab Chamber of Commerce & Industries ( IACCI)

Member of Indo-American Chamber of Commerce (IACC),

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

**Training, Examination And Certification to Engineers & Individuals**

## SANJARY EDUCATIONAL ACADEMY SOCIETY OFFERS INTERNATIONAL CERTIFICATION COURSES

**SANJARY (SEA) IS ONE TO CERTIFYING / QUALIFYING**

- Certified Piping Design Engineer
- Certified QA / QC Manager
- Certified QA/QC Engineer Civil,
- Certified QA/QC Engineer Mechanical
- Certified QA / QC Engineer Piping
- Certified QA/QC Engineer E&I
- Certified Document Controller
- Certified Welding Engineer
- Certified Safety Engineer
- Internal Auditor QMS

**CERTIFICATE RECOGNIZED INTERNATIONAL  
IN MORE THAN 30 COUNTRIES**

**All the International Certification Courses  
offered by Sanjary Educational Academy  
Society for the Below Industries / Sectors  
In India & Abroad**

Oil and Gas

Petrochemical

Refinery

Power Plant

High Rise Building

Heavy Fabrication

Construction Project

EPC Consultants



### Course Director / Lead Trainer

Mr. Mohammed Saleem

President of Sanjary Educational Academy  
International Industry Expert with more  
than 25 Years of Experience &  
National Awards Winners

1. Bharat Jyoti Award - ( 2006 )
2. Bharat Shiksha Ratan Award - ( 2015 )
3. Rashtriya Gaurav Award - ( 2016 )



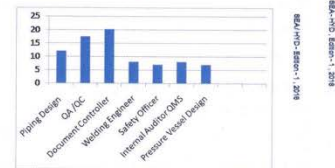
### National & International Awards Winners Sanjary Educational Academy Awarded The Most Prestige's Since 2002

1. Indian Achievers Award  
for Quality Excellence - 2010
2. International Achievers Award  
for Education Excellence - 2010
3. Indira Gandhi Excellence Award - 2013
4. Best Performance Award for Excellence  
in Social & Education - 2015



### No. of Batches Completed From 2009 to 2017

- |   |  |
|---|--|
| 1. Piping Design Engineer - 112 Batches | 5. Safety Engineer - 72 Batches        |
| 2. QA/QC Engineer - 112 Batches         | 6. Internal Auditor QMS - 82 Batches   |
| 3. Document Controller - 225 Batches    | 7. Pressure Vessel Design - 71 Batches |
| 4. Welding Engineer - 81 Batches        |  |



Since 2002

ISO 9001 : 2015 Certified

## SANJARY EDUCATIONAL ACADEMY

### Registered & Head Office :

5-9-233/234/235, Shop No. 24, 2nd Floor, Sanali Mall,  
Opp. Chermas, Abids, Hyderabad-500 001. T.S. India.

Tel. : +91 8121068809

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Web. : [www.sanjaryacademy.in](http://www.sanjaryacademy.in)

Dear Sir ,

Kindly visit our websites : [www.pipingdesigncourse.in](http://www.pipingdesigncourse.in) / [www.pipingdesigncourse.com](http://www.pipingdesigncourse.com) / [www.pipingdesigncourse.net](http://www.pipingdesigncourse.net) / [www.sanjaryacademy.in](http://www.sanjaryacademy.in) / [www.sanjaryacademy.com](http://www.sanjaryacademy.com) for details . We confirm your course booking for the Certified Course as below :

Sanjary Educational Academy Society is only one in the world to Certified - Certified Piping Design Engineer , Certified Pressure Vessel Design Engineer , etc. last more than 10 years

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

All Piping Design Engineer courses cover the comprehensive competency and developing skills aspect of 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.

Sanjary ( SEA ) Certificate is Recognized International in more than 30 Countries and our Certified Engineers are already working including - India , Saudi Arabia , UAE , Qatar , Kuwait , Oman , Bahrain , Jordan , Iraq , Iran , Turkey , Yemen ,Sudan , Libya, Nigeria , Sudan , Libya , Portugal, Cameroon, Congo , Germany , USA , Canada , Norway , London , Vitemum  
**Benefit of Our Certified Courses :**

1. Engineers get easy job any where in world in below mentioned industries / sectors
2. Get promotion in current job
3. Get professional skill knowledge as actual required on the job

<u>PIPING DESIGN &amp; ENGINEERING CERTIFICATION COURSE</u>	<u>PIPING DESIGN &amp; ENGINEERING CERTIFICATION COURSE</u>
<ul style="list-style-type: none"><li>● <b>CERTIFIED PIPING DESIGN ENGINEER</b></li></ul>	<ul style="list-style-type: none"><li>● <b>P G DIPLOMA IN PROCESS PIPING DESIGN AND ENGINEERING</b></li></ul>
<b>COURSE COVER UP :</b> <ul style="list-style-type: none"><li>- Basic</li><li>- Piping Design</li><li>- Process Engineering</li><li>- Piping Engineering</li><li>- Layout Engineering</li><li>- Pipe Stress Analysis</li><li>- Drafting</li><li>- Fabrication of Piping &amp; Hydro testing</li></ul>	<b>COURSE COVER UP :</b> <ul style="list-style-type: none"><li>- Basic</li><li>- Piping Design</li><li>- Process Engineering</li><li>- Piping Engineering</li><li>- Layout Engineering</li><li>- Pipe Stress Analysis</li><li>- Drafting</li><li>- Fabrication of Piping &amp; Hydro testing</li></ul>
<b>STUDY OF SOFTWARE :</b> <ul style="list-style-type: none"><li>- Study of CAESAR – II</li><li>- Study of AUTOCAD</li></ul>	<b>STUDY OF SOFTWARE :</b> <ul style="list-style-type: none"><li>- Study of CAESAR – II</li><li>- Study of PDMS</li><li>- Study of AUTOCAD</li></ul>
<b>PROJECT – Piping Design &amp; Drafting</b>	<b>PROJECT – Piping Design &amp; Drafting</b>
<b>DURATION OF COURSE : 50 Days</b>	<b>DURATION OF COURSE : 3 Months</b>
<b>COURSE FEE : Rs 31000/-</b>	<b>COURSE FEE : Rs 45000/-</b>

## **International Certification Course**

- **CERTIFIED PIPING DESIGN ENGINEER**

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

**Duration of Course** : **50 Days - Hyderabad , Telangana , India**

**Course Fee** : **-**

**New Batch Date** :

**Timing / Daily Classes / Practice** : **11:00 AM - 3:00 PM**

**Course Fee for Foreign Students** : **US Dollar \$ 1200/- Hyderabad , India**

**Course cover up**

- **Basic**
- **Piping Design**
- **Process Engineering**
- **Piping Engineering**
- **Layout Engineering**
- **Pipe Stress Analysis**
- **Drafting etc**
- **Fabrication of Piping & Hydro testing** ,

**Study of Software** : **-Study of CAESAR II**

- **Study of AutoCAD**

**Project Work** : **Piping Design and Drafting**

**Submission of project as per ASME**

**Maximum No. of Seats / students in a Batch** : **10 only -**

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### **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 CEASAR II and Study of AutoCad and Project submission.

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 and AutoCad 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 is 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 **Certified Piping Design Engineer**

## **International Certification Course**

### **1. CERTIFIED PIPING DESIGN ENGINEER**

## **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**

**Project work – Piping Design & Drafting.**

#### **PART- 6**

**Submission of Project as per ASME**



## **PART- 7**

### **Fabrication of Piping and Hydro testing**

## **PART- 8**

### **Study of AutoCAD**

## ***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 Standards 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 ( e.g. Saudi Aramco )

- *Several Examples of wall thickness calculation for Oil and Gas , Petrochemical , Refineries ( e.g. 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 Calculations***
- 

### **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, Thermal Expansion & Occasional Loads.
- 

##### **Module – 21 Stresses due to Sustained Loads , Stresses due to Displacement Strains and 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 Analyst'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 : PROJECT WORK – Piping Design & Drafting**

## **PART- 6 : Submission of Project as per ASME**

## **PART- 7 : Fabrication of Piping and Hydro testing**

## **PART- 8 : Study of AUTOCAD**

**Note : Certificate , Marks Sheet and Qualification Card will be awarded to the students / candidate after successful completion of course & examination and project Report Submission.**

**Venue** : SANJARY EDUCATIONAL ACADEMY ,  
5-9-233 / 234 , S. No. 24 & 25 , 3<sup>rd</sup> Floor, SANALI MALL Opposite  
Chermas Showroom , Abids , Hyderabad - 500001, Andhra Pradesh ,  
India

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 certified courses.

3. Certificate, Mark Sheet and Qualification Card will be awarded to engineer after successfully completion of course & examination and submission of **Project**.

-Sanjary Educational Academy legally established in the year 2002. **Sanjary Educational Academy is a Society** Registered No. 347/08 by Government of Telangana , India .

- Registered with Ministry of Commerce and Industry , Directorate General of Foreign Trade , Government of India.

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

- Registered “ Trade Marks Registry “ , Government. of India

- Member of Indo – Arab Chamber of Commerce & Industries (IACCI).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 Organization – Accredited with UKAS , UK

- Sanjary’s ( SEA ) Piping Design Engineer course recognized with SPED , USA, Since 2013

### **SANJARY EDUCATIONAL ACADEMY Awarded The Most Prestige’s National & International Awards Winners**

- a) Indian Achievers Award for Quality Excellence
- b) International Achievers Awards for Education Excellence
- c) Indira Gandhi Excellence Award for Education Excellence
- d) Best Performance Award for excellence in social and education

Mr.Mohammed Saleem being the President of SEA has been awarded the following:

(1) Bharath Jyoti Award, India

(2) Bharath Siksha Rattan Award, India

(3) Rashtriya Gaurav Award, India

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

### **M/s SANJARY EDUCATIONAL ACADEMY**

5-9-233 / 234 / 235 , S. No. 24 & 25 , 3<sup>rd</sup> Floor , SANALI MALL ,Opposite Chermas Showroom , Abids , Hyderabad - 500001, Telangana , India.

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Thanks and regards

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