

Annexure I: Course Curriculum

TABLE 1: MODULE-WISE COURSE CONTENT AND OUTCOME					
SL.NO	MODULE NAME	MODULE CONTENT	MODULE LEARNING OUTCOME	DURATION (HRS)	
1	Introduction to Piping Design and Software Overview	Overview of Piping design	Various software tools used to design the steel Structure	2	
2		Project setup and configuration		Basics of Steel Structure and its needs	1
3		Input drawing study			3
4		Project standards			2
5		Project specifications			1
6	Equipment and Piping Component Modelling	Equipment Modeling	Impart knowledge of necessary Techniques and components involved in the design, Modeling of Steel Structure using software tools.		1
7		creating equipment components		2	
8		Nozzle and its connections		1	
9		Types of piping components		2	
10		Creating Pipe routing		2	
11		Adding pipe fitting, valves, flanges etc.		1	

12	Pipe Routing and Editing	Advanced pipe routing techniques	Impart knowledge of necessary Techniques and components involved in the design, Modeling of Steel Structure using software tools.	3
13		Editing and Modify the pipe routes		2
14		Clash detection principles		1
15		Resolving the pipe clash		3
21	Isometric Drawings and Documentation	Generating isometric drawings	Impart knowledge on generation of General Arrangement Drawing, Shop Drawing of Steel Structure	2
22		Creating and managing documentation		3
23		Pipe support system and its configurations		2
24		Generating reports and documentation		1
30	Project Collaboration and Integration	Collaboration tools	Impart knowledge about CNC Code generation and Supporting file creation.	3
31		Integration with other design disciplines		3
32		Reviewing the piping design		3

Annexure II: Use Cases and Test Projects

TABLE 2: OVERALL COURSE LEARNING OUTCOME ASSESSMENT CRITERIA AND USECASES			
LEARNING OUTCOME	ASSESSMENT CRITERIA	PERFORMANCE CRITERIA	USECASES
Basics of piping Structure and its needs	Demonstrates ability to perform job-specific tasks effectively,	Application and Needs of the structure	Design and model the complete Structure of Commercial and Industrial Buildings also generate spool and Erection Drawings by using the software tools.
Various software tools used to design the piping Structure	Ability to perform job-specific tasks effectively, using relevant tools, techniques, or methodologies	Based on the requirement selection of software tools, Ensure the effective utilization of software tools.	
Impart knowledge of necessary Techniques and components involved in the design, Modeling of pipe routing using software tools	Completes assigned projects or use cases demonstrating innovation, thoroughness, and skill application relevant to industry standards	Ensure the Design Standards followed, and feasibility of fabrication and erection.	
Impart knowledge on generation of General Arrangement Drawing, Shop Drawing of piping Structure	Completes assigned projects or use cases demonstrating innovation, thoroughness, and skill application relevant to industry standards	Ensure the Quality of drawings like details, presentation etc.,	
Impart knowledge about CNC Code generation and Supporting file creation.	Clearly presents fabrication drawings or project outcomes using professional communication and documentation standards	Ensure the reports and details are meet the needs	

TABLE 3: LIST OF FINAL PROJECTS (20 PROJECTS THAT COMPREHENSIVELY COVER ALL THE LEARNING OUTCOME)

SL.NO	FINAL PROJECT
1	Design and detail the steel framework in places like offices,
2	Design and detail the complex structures in factories and warehouses.
3	Design and detail the Bridges for railway track Crossing
4	Design and detail the Bridges for Road Crossing
5	Design and detail the offshore oil industries platforms.
6	Design and detail the offshore gas industries platforms.
7	Design and Detail the support heavy equipment in petrochemical plants.
8	Design and Detail the support heavy equipment in Rice plants.
9	Design and Detail the support heavy equipment in petrochemical plants.
10	Design and detail the onshore oil industries platforms.
11	Design and detail the onshore gas industries platforms.
12	Design and detail the steel framework in places like multi storage shopping mall
13	Design and detail the steel framework in places like multi storage Business centre
14	Design and detail the steel framework in places like multi storage Building Entrance Arch
15	Design and detail the steel framework in places like multi storage Building Elevation
16	Design and detail the multi storage vehicle parking
17	Design and detail the River Bridge
18	Design and detail the Tower
19	Design and detail the service equipment platforms in commercial buildings
20	Design and detail the airport stations and pedestrian bridges

Annexure III: Assessment Rubrics

TABLE 4: COURSE ASSESSMENT RUBRICS (TOTAL MARKS: 70)				
ASSESSMENT CRITERIA	DESCRIBE THE CRITERIA OF THE BELOW CATEGORY PERFORMANCE			TOTAL MARKS
	FAIR	GOOD	EXCELLENT	
1	3	4	5	5
2	3	4	5	5
3	13	20	25	25
4	13	20	25	25
5	8	12	15	10

Category	Assessment Criteria	Performance Levels	Weight age (Marks)
Practical Skills Proficiency	Demonstrates ability to perform job-specific tasks effectively, using relevant tools, techniques, or methodologies	Fair, Good, Excellent	20
Technical Knowledge Application	Applies theoretical concepts to practical scenarios with accuracy and relevance (e.g., Piping Design, fitting Design, components & Erection feasibility)	Fair, Good, Excellent	15

Project Execution	Completes assigned projects or use cases demonstrating innovation, thoroughness, and skill application relevant to industry standards.	Fair, Good, Excellent	25
Communication and Reporting	Clearly presents findings, solutions, or project outcomes using professional communication and documentation standards (e.g., MTO reports, drawings).	Fair, Good, Excellent	10

Performance Levels Description

Level	Description
Fair (50%-64%)	Basic performance; demonstrates minimal skill application and understanding; needs significant improvement to meet industry standards.
Good (65%-79%)	Competent performance; meets expectations with minor gaps; capable of performing job tasks independently with occasional guidance.
Excellent (80%-100%)	Outstanding performance; exceeds expectations with exceptional skill application and problem-solving; ready for professional industry roles.