

Piping Systems: Mechanical Design & Specifications

**MUE204
Mechanical &
Utility
Engineering**

COURSE TITLE

Piping Systems: Mechanical Design & Specifications

COURSE DATE/ VENUE

09th-13th Sep

Prague, Czech Republic

COURSE REFERENCE

MUE204

COURSE DURATION

05 Days

DISCIPLINE

Mechanical & Utility Engineering

COURSE INTRODUCTION

This course delve into the critical aspects of designing and specifying piping systems, focusing on the mechanical elements that ensure their functionality, safety, and efficiency. Whether you're a seasoned professional or new to the field, this course is designed to provide valuable insights & knowledge that you can apply directly to your work.

COURSE OBJECTIVE

Upon successful completion of this course, the delegates will be able to:

- **Understand the Fundamentals:** Gain a solid foundation in the basics of piping systems, including key components, materials, and design principles.
- **Master Mechanical Design:** Learn how to design piping systems to meet mechanical and operational requirements, including stress analysis, supports, and thermal considerations.

- **Develop Specifications:** Acquire skills in creating detailed and accurate piping specifications and managing documentation effectively.
- **Stay Current:** Explore emerging trends and technologies in the field of piping systems.

COURSE AUDIENCE

This course is ideal for:

- **Engineers:** Mechanical, process, and design engineers involved in the planning and implementation of piping systems.
- **Designers:** Professionals responsible for the detailed design and specification of piping systems.
- **Project Managers:** Individuals overseeing projects that involve piping systems.
- **Technical Specialists:** Those who need a comprehensive understanding of piping system design and specifications.

COURSE CONTENT

Day 1: Introduction to Piping Systems

Overview and Basics

- Introduction to Piping Systems
 - Definition and purpose of piping systems
 - Types of piping systems (e.g., process piping, utility piping)
 - Key components and terminology
- Piping Materials and Selection
 - Overview of common materials (steel, copper, PVC, etc.)
 - Factors influencing material selection (corrosion, temperature, pressure, etc.)
 - Material specifications and standards

Design Fundamentals

- Piping Design Principles
 - Basic principles of piping design
 - Pipe sizing and capacity calculations

- Fluid flow principles and pressure drop calculations
- Design Codes and Standards
 - Introduction to relevant codes (ASME B31.1, ASME B31.3, etc.)
 - Understanding and applying design codes
 - Compliance and safety considerations

Day 2: Detailed Design and Analysis

Mechanical Design Aspects

- Pipe Stress Analysis
 - Overview of stress analysis techniques
 - Factors affecting pipe stress (thermal expansion, pressure, etc.)
 - Using software tools for stress analysis
- Supports and Anchors
 - Types of supports and anchors
 - Proper placement and design considerations
 - Impact on system performance and safety

Advanced Design Considerations

- Piping Layout and Routing
 - Designing efficient piping layouts
 - Routing considerations (minimizing bends, avoiding obstructions)
 - Space constraints and accessibility
- Thermal and Acoustic Considerations
 - Managing thermal expansion and contraction
 - Acoustic considerations and noise control

Day 3: Specifications and Documentation

Creating Specifications

- Piping Specifications
 - Developing detailed piping specifications
 - Standard vs. project-specific specifications
 - Typical content of specifications (material, dimensions, testing requirements)
- Document Control

- Importance of proper documentation
- Techniques for maintaining and updating documents
- Managing revisions and version control

Quality Assurance and Compliance

- Inspection and Testing
 - Common inspection methods (visual, hydrostatic, etc.)
 - Testing procedures and acceptance criteria
 - Addressing non-compliance issues
- Safety and Environmental Considerations
 - Ensuring safety in design and operation
 - Environmental impact and mitigation strategies
 - Regulatory requirements and compliance

Day 4: Practical Applications and Case Studies

Case Studies

- Real-world Case Studies
 - Analyzing successful piping designs and failures
 - Lessons learned from case studies
 - Group discussion and analysis

Software Tools and Simulation

- Introduction to Design Software
 - Overview of common piping design software (AutoCAD, PDMS, etc.)
 - Basic functions and features
 - Creating and modifying piping designs using software
- Simulation and Modeling
 - Simulating piping systems under different conditions
 - Analyzing simulation results and making design adjustments

Day 5: Review and Application

Review and Q&A

- Course Review
 - Summary of key concepts and techniques
 - Review of critical design and specification aspects

- Open Q&A session
- Assessment
 - Written assessment to test understanding
 - Review of answers and feedback

Implementation and Future Trends

- Implementing Design and Specifications
 - Applying knowledge to real-world projects
 - Common challenges and solutions
- Emerging Trends and Technologies
 - Recent developments in piping design and technology
 - Future trends and their impact on the industry
- Closing Remarks and Certification
 - Summary of the course
 - Issuance of certificates

Final questions and closing

COURSE CERTIFICATE

TRAINIT ACADEMY will award an internationally recognized certificate(s) for each delegate on completion of training.

COURSE FEES

£5,500 Per Delegate. This rate includes participant's manual, Hand-Outs, lunch, coffee/tea on arrival, morning & afternoon of each day.

COURSE METHODOLOGY

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice

type will be made available on daily basis to examine the effectiveness of delivering the course.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions

