Scandinavian Academy
Training Center

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Course: Pumps, Valves: selection and Maintenance

Code	City	hotel	Start	End	price	Language - Hours
509	Dammam	Hotel Meeting Room	2026-03-22	2026-03-26	11450 SR	En - 25

OVERVIEW

This course provides you with an understanding of the nature of pumps and valves and how they interact for optimum system performance.

The course discusses the requirements necessary for the selection of pumps and valves. It is structured in a sequence, starting from basics to detailed discussion of various aspects of both pumps and valves. It is designed to help you develop a full understanding of how pumps and valves work, covering selection, installation, operation, maintenance, and trouble shooting.

This course covers topics, such as the flow of fluids (e.g., calculating the flow of fluids and pressure drop), the selection of centrifugal pumps, and the selection of positive displacement pumps. It also discusses types of valves, flow characteristics of valves, and the best practices in installation, measurement of flow rate in closed conduits; calibration methods for Venturi, Orifice, and elbow meters; and operation and maintenance.

During the course you will receive guidance in making cost-effective decisions and tips for avoiding poor system operation. It also discusses how pumps and valves are used in different industries.

You Will Learn To

- Calculate the pressure loss in a pipeline due to friction for circular and noncircular ducts
- Determine the pipe diameter that minimizes first plus operating costs of a piping

system
- Generate a system curve for a pipeline
- Identify the testing methods used to obtain a performance map for a centrifugal pump
- Employ the system curve to select an efficient centrifugal pump
- Explain how to predict when cavitation will occur and identify the necessary steps to avoid it
- Explain how to use dimensional analysis to correlate experimental data for a pump
- Explain how the specific speed is determined
- Apply affinity laws to predict off-design behavior for a pump
- Identify types of positive displacement pumps
- Examine common methods of measuring flow rate in a pipeline
- Identify the types of meters available for flow rate measurement
- Generate calibration curves for venturi, orifice, and elbow meters
- Describe the different types of valves that are commercially available
- Explain how to select the correct valve for a piping system
- Identify and avoid problems by selecting the correct valve
- Explain how to install, operate and maintain valves
- Describe the process of diagnosing and troubleshooting valve problems

Who Should Attend

This course is designed for design engineers, process selection engineers, procurement personnel, project engineers, quality personnel, operation & maintenance engineers, and inspection engineers.

Daily Outlines

Day one

- PUMP BASICS

- Basic pump theory
- General Safety Requirements
- Pump Performance Basic Terms
- Pumping Factors
- Pump Performance Curves
- Pump in series or parallel
- Multistage Pump
- Pump start up and shutdown
- Pump Priming

Day Two

- CLASSIFICATION OF PUMPS
- Dynamic pumps
- Centrifugal pumps
- Positive displacement pumps
- Reciprocating pumps
- Rotary pumps
- Slurry Pumps Pump Glossary
- PUMP MAINTENANCE
- Overview of Maintenance Practice
- Corrective
- Preventive
- Predictive
- Lubrication Overview
- Pump Maintenance Procedure (Daily,weekly,semi annual,Annual)

Day Three

- TROUBLESHOOTING PROCEDURES AND REMEDIAL STEPS
- Pre-repair Investigation
- Onsite Inspection

- Miscellaneous remedial steps
- PUMP TROUBLESHOOTING
- Cavitation
- Check list for Centrifugal Pump Troubles
- Check list for Rotary Pump Troubles
- Check list for Reciprocating
- Pump Troubles

Day Four

- INTRODUCTION TO VALVES
- Principal functions of valves
- Isolation
- Throttling
- Check
- Control
- Gate Valve
- Globe Valve
- Plug Valve
- Ball Valve
- Check Valve
- Needle Valve
- Diaphragm Valve
- Butterfly Valve
- Valve Symbols
- Valve Actuators
- Valve Glossary

Day five

- VALVE MAINTENANCE & TROUBLESHOOTING
- Preventive Maintenance

- Prior to startup
- After startup
- Workshop Overhaul
- Maintenance Tips
- Valve Troubleshooting Guide
- VALVE LEAKAGE
- Leakage in gate valve
- Leakage in globe valve
- Leakage in check valve
- Leakage in ball valve
- Leakage in butterfly valve

The Scandinavian Academy for Training Center adopts the latest scientific and professional methodologies in training and human resource development, aiming to enhance the efficiency of individuals and organizations. Training programs are delivered through a comprehensive approach that includes:

- Theoretical lectures supported by PowerPoint presentations and visual materials (videos and short films).
- Scientific evaluation of participants before and after the program to measure progress and knowledge acquisition.
- Brainstorming sessions and practical role-playing to simulate real-life scenarios.
- Case studies tailored to align with the training content and participants work nature.
- Assessment tests conducted at the end of the program to evaluate the achievement of training objectives.

Each participant receives the training material (both theoretical and practical) in printed form and saved on a CD or flash drive. Detailed reports, including attendance records, final results, and overall program evaluations, are also provided.

Training materials are prepared professionally by a team of experts and specialists in various fields. At the end of the program, participants are awarded a professional attendance certificate, signed and accredited by the Scandinavian Academy for Training Center.

Program Timings:

- 9:00 AM to 2:00 PM

The program includes:

- A daily buffet provided during the sessions to ensure participants comfort.
- A closing ceremony on the final day to distribute certificates and celebrate participants achievements.