



Mechanical Engineering

Water Distribution Network Operation, Inspection & Maintenance

Course Introduction

Water Distribution Systems should be planned, designed, constructed, operated and maintained to deliver an adequate supply of water in a safe, cost-effective and reliable manner. An adequate water supply is required to maintain the health and economic viability of a community. In addition, an adequate supply of water is one of the primary requirements for fire suppression. This course is intended for those who require better understanding of water distribution systems planning, design and inspection.

This will achieve by better understanding of water distribution systems and their auxiliaries and accessories related to the system. You will be expected to complete a water distribution system planning and design under instructor guidance by using first principle methods and/or design aids. This course is designed to prepare water system staff to operate safely and cost effectively and maintain water systems. Also to provide them with knowledge, skills, abilities and judgment critical areas of water distribution system including storages, pumping, valves, pipelines and other accessories related to the system. This course will focus on train the Engineers on practical aspects of planning, design then inspection of water system to give others staff to operate and maintain the system with emphasis on safe practices, procedures and troubleshooting

Target Audience

- Automotive Engineer
- Boiler Engineer
- Ceramics Engineer
- Equipment Engineer
- High-Pressure Engineer
- Marine Engineer
- Mechanical Design Engineer
- Mechanical Engineer
- Naval Architect

- Pipeline Engineer
- Power Engineer
- Rotating Equipment Engineer
- Senior Mechanical Engineer
- Turbine Engineer
- Validation Engineer

Learning Objectives

- Understanding the Fundamentals of Water Distribution Systems
- Design of New Water Distribution Systems
- Analyze existing Systems and be able to find out existing problems
- Understanding Operation, Inspection, Maintenance & Repair of Water Networks

Course Outline

• 01 DAY ONE

MODULE (01) INTRODUCTION

- 1.1 Basic Concepts
- 1.2 Water Distribution System Layout
- 1.3 Population Estimation

MODULE (02) REVISION, OF HYDRAULICS ENGINEERING (PART I)

- 2.1 Pressure
- 2.2 Hydrostatic Pressure
- 2.3 Pressure Head
- 2.4 Measurement of Pressure
- 2.5 Flow Rate
- 2.6 Continuity of Flow
- 2.7 Conservation of Energy
- 2.8 Flow in Pipes under Pressure

- 2.9 Hazen-Williams Equation
- 2.10 Hazen-Williams Nomo Graph

• **02 DAY TWO**

MODULE (02) REVISION, OF HYDRAULICS ENGINEERING (PART II)

- 2.11 Flow Measurement
- 2.12 Gravity Flow in Pipes
- 2.13 Manning's Formula
- 2.14 Partial Flow in Pipes
- 2.15 Open Channel Flow Measurement
- 2.16 Non-uniform Open Channel Flow
- 2.17 Specific Energy
- 2.18 Critical Flow Gradually
- 2.19 Gradually varied Flow
- 2.20 Rapidly varied Flow

• **03 DAY THREE**

MODULE (03) WATER DISTRIBUTION SYSTEMS

- 3.1 Design Factors
- 3.2 Required Flows and Pressures
- 3.3 Per Capita Demand
- 3.4 Variations in Water Demand
- 3.5 Fire Flows
- 3.6 Pressures
- 3.7 Pipeline Layout
- 3.8 Water Mains
- 3.9 Materials
- 3.10 Installation
- 3.11 Pump Design
- 3.12 Centrifugal Pumps
- 3.13 Pump Characteristics
- 3.14 Pump Head Curve
- 3.15 System Characteristics
- 3.16 System Head Curve
- 3.17 Pump Operating Point
- 3.18 Parallel Operation

• **04 DAY FOUR**

MODULE (04) DISTRIBUTION SYSTEM

- 4.1 Types of Distribution Reservoirs
- 4.2 Flow in Pipe Networks
- 4.3 Pipes in Series
- 4.4 Pipes in Parallel
- 4.5 Pipe Network Analysis
- 4.6 Hydraulics of Water Wells

MODULE (05) PRESSURE PIPING SYSTEMS AND WATER QUALITY ANALYSIS

- 5.1 WATER use and availability
- 5.2 Pressure Systems
- 5.3 Energy Loss
- 5.4 Energy Gains- Pumps
- 5.5 Control Valves
- 5.6 Pipe Network
- 5.7 Network Analysis
- 5.8 Water Quality Analysis

• 05 DAY FIVE

MODULE (06) MAINTENANCE OF DISTRIBUTION NETWORK SYSTEM

- 6.1 Construction site inspections on work by other utilities
- 6.2 Pipeline facility repair
- 6.3 Line patrols
- 6.4 Sluice valve operation
- 6.5 Pipeline appurtenance inspection
- 6.6 Public notification
- 6.7 Pipe flushing

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 23, 2025	June 27, 2025	5 days	4250.00 \$	UAE - Dubai

FROM	TO	DURATION	FEES	LOCATION
Sept. 15, 2025	Sept. 19, 2025	5 days	5950.00 \$	switzerland - Geneva
Dec. 1, 2025	Dec. 5, 2025	5 days	4250.00 \$	UAE - Abu Dhabi