

Water, Sanitation, and Rainwater Drainage Networks

Düsseldorf (Germany)

22 December 2025 - 2 January 2026

UK Training

PARTNER



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Code: NC28 From: 22 December 2025 - 2 January 2026 City: Düsseldorf (Germany) Fees: 8300 Pound

Introduction

Water and sanitation infrastructure is a cornerstone of public health, environmental protection, and sustainable urban development. This comprehensive course provides technical, regulatory, and operational insights into the planning, design, construction, and management of water supply systems, sewerage, and stormwater drainage networks. The program emphasizes sustainability, climate resilience, and the use of digital tools such as GIS and hydraulic modeling in delivering effective services.

Course Objectives

By the end of this course, participants will be able to:

- Understand the technical principles of water supply, sanitation, and drainage systems.
- Design and evaluate integrated water and wastewater infrastructure networks.
- Plan and supervise construction projects related to water, sanitation, and drainage.
- Apply national and international standards for sustainable and climate-resilient systems.
- Assess and mitigate environmental and public health risks related to water and sanitation.

Course Outlines

Day 1: Introduction to Water and Sanitation Infrastructure

- Importance of Water, Sanitation, and Hygiene WASH.
- Overview of urban and rural water supply systems.
- Introduction to sanitation and sewerage networks.
- The role of rainwater drainage in urban planning.
- Stakeholders and institutional frameworks in service delivery.

Day 2: Water Sources and Treatment Processes

- Types of water sources: surface and groundwater.
- Water quality standards and testing parameters.
- Water treatment methods: physical, chemical, biological.
- Comparison of small-scale and large-scale treatment systems.
- Case studies of successful potable water projects.

Day 3: Water Distribution Network Design

- Hydraulic principles and pressure zone management.
- Selection of pipeline materials, layouts, and jointing techniques.
- Design of pumping stations and distribution reservoirs.
- Elevated tank functions and system storage.



- Leak detection systems and water loss control.

Day 4: Sanitation Systems and Sewerage

- On-site sanitation options: septic tanks, pit latrines.
- Centralized off-site sewerage systems.
- Gravity and pressure-based sewer designs.
- Characteristics of wastewater and treatment requirements.
- Sludge handling, transport, and safe disposal.

Day 5: Drainage and Stormwater Management

- Types of drainage: surface, subsurface, and combined systems.
- Rainfall-runoff estimation and hydrology principles.
- Design principles for urban stormwater networks.
- Implementation of Sustainable Urban Drainage Systems SuDS.
- Flood risk assessment and mitigation strategies.

Day 6: Integrated System Planning and GIS Applications

- Concepts of integrated planning for water and sanitation.
- GIS-based mapping and spatial data management.
- Digital modeling using EPANET, SWMM, or similar tools.
- Infrastructure surveys and data collection techniques.
- Decision-making tools for planning and expansion.

Day 7: Construction Supervision and Quality Control

- Project implementation steps: excavation, pipe laying, and backfilling.
- Material testing protocols and quality assurance plans.
- Health and safety procedures for construction sites.
- Effective supervision and contractor oversight.
- Field challenges and troubleshooting techniques.

Day 8: Environmental and Public Health Considerations

- Conducting Environmental Impact Assessments EIA.
- Infrastructure resilience in the context of climate change.
- Preventing contamination and controlling vector breeding.
- Promoting community health and sanitation behavior.
- Integrating infrastructure planning with health initiatives.

Day 9: Operation, Maintenance, and Asset Management

- Preventive maintenance for water and sewer systems.
- Inspection, cleaning, and repair techniques.
- Monitoring system performance and water quality.
- Using asset management systems for planning.
- Tariff design and financial sustainability models.



Day 10: Governance, Policy, and Sustainability

- Standards and benchmarks: WHO, ISO, and SDGs.
- Legal and institutional responsibilities in the sector.
- Infrastructure financing and Public-Private Partnerships PPP.
- Community participation and demand-side management.
- Final project presentations, course evaluation, and certification.

Why Attend This Course: Wins & Losses!

- Comprehensive technical knowledge in water, sanitation, and drainage systems.
- Confidence in applying international standards and sustainable design principles.
- Ability to supervise infrastructure projects with quality and safety in focus.
- Practical exposure to digital tools such as GIS and EPANET for network modeling.
- Enhanced capability to align infrastructure with public health and environmental needs.

Conclusion

This course is essential for engineers, planners, and decision-makers involved in water and sanitation services. Participants will complete the training with the skills to design, implement, and manage infrastructure systems that are technically sound, environmentally sustainable, and socially inclusive.

Through hands-on tools and real-world case studies, they will be empowered to make a lasting impact in urban and rural development contexts.



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