

COURSE OVERVIEW TE0269
Water Network System & Component

Course Title

Water Network System & Component

Course Date/Venue

November 18-22, 2024/Fujairah Meeting Room,
 Grand Millennium Al Wahda Hotel, Abu Dhabi,
 UAE

Course Reference

TE0269

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Description



This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.



This course is designed to provide participants with a detailed and up-to-date overview of Water Network System and Component. It covers the water distribution systems and the basics of hydrology, water cycle and sustainable water resource management; the water quality standards and regulations; the types of pipes and materials; the hydraulics fundamentals and design considerations for water networks; the pumps and pumping stations, water storage facilities, valves and control devices; and the water meters and flow measurement, SCADA systems for water networks and maintenance and rehabilitation of water networks.



Further, the course will also discuss the network modelling, hydraulic modelling of water distribution networks and water quality modelling; the demand forecasting and management, leak detection, assessing non-revenue water and strategies for loss reduction; the smart water networks, renewable energy integration and GIS applications in water networks; assessing the impacts of climate change on water distribution and strategies for resilience and adaptation; the water network security and emergency preparedness; and the emerging materials and technologies for pipe systems.

During this interactive course, participants will learn the regulatory framework and compliance, environmental considerations in network design and community engagement and customer service; the economic and financial management covering financial planning, cost recovery and investment strategies for water networks; and the key principles of project management applied to the development and rehabilitation of water networks.

Course Objectives

Upon the successful completion of this course, each participant will be able to: -

- Apply and gain systematic techniques and methodologies on water network system and component
- Discuss water distribution systems and the basics of hydrology, water cycle and sustainable water resource management
- Review water quality standards and regulations and identify the types of pipes and materials
- Discuss hydraulics fundamentals and design considerations for water networks
- Recognize pumps and pumping stations, water storage facilities and valves and control devices
- Apply water meters and flow measurement, SCADA systems for water networks and maintenance and rehabilitation of water networks
- Illustrate network modelling, hydraulic modelling of water distribution networks and water quality modelling
- Employ demand forecasting and management, leak detection, assessing non-revenue water and strategies for loss reduction
- Discuss smart water networks, renewable energy integration and GIS applications in water networks
- Assess the impacts of climate change on water distribution and strategies for resilience and adaptation
- Carryout water network security and emergency preparedness as well as discuss emerging materials and technologies for pipe systems
- Explain regulatory framework and compliance, environmental considerations in network design and community engagement and customer service
- Carryout economic and financial management covering financial planning, cost recovery and investment strategies for water networks
- Implement the key principles of project management applied to the development and rehabilitation of water networks

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials, sample video clips of the instructor’s actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.

Who Should Attend

This course provides an overview of all significant aspects and considerations of water network system and component for utility managers, mechanical engineers, civil engineers, water engineers, environment engineers, engineering managers, design consultants, utility managers, superintendents, supervisors and other senior technical staff.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US\$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation


Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

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The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units (CEUs)** in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Dr. Yousef Al-Mashni, PhD, MSc, BSc, is an International Expert in Analytical Laboratory & Waste Water Treatment with over 35 years of extensive experience. He is an authority in Water and Waste Water Treatment, Water Quality Management, Hydraulic Network System, Water Pipeline System, Water Distribution System, Industrial Water Management, Water Storage, Industrial Water Management, Water Analysis & Reporting, Water Sampling & Testing, Water Analyzer, Helmith Ova & Salmonella

in Waste Water, Sludge, Microbiological Aspects & Analysis of Wastewater, Laboratory Equipment, Laboratory Quality Management Systems (ISO 17025 and ISO 15189), Lab Safety & Health, Good Laboratory Practice (GLP) and Safety Procedure in Laboratories. His wide expertise also covers, Pumps and Pumping Stations, Medical Laboratory Auditing, ISO 15489, Infection Control, Internal Quality Control for Microbiologists, Analytical Techniques, Biochemical, Hematological, Parasitological, Biochemical, Microbiological & Serological Analysis of Clinical Specimens, Microbiology of Wetlands, Microbiological Indoor Air Quality, Enterococcus, Pseudomonas & Aeromonas, Sulfate Reducing Bacteria, Fluorescence Microscopy, Planktology of Ambient Environment, Oral, Medical & Diagnostic Microbiology and Oral & Dental Hygiene. He is currently the Deputy Principal & Chief Technical Instructor of UNRWA wherein he is responsible in developing and managing operations at the college/centre including building workshops and laboratories capacity, curriculum development and introducing new courses.

During his long career life, Dr. Yousef worked for many international companies handling key positions such as ICDL Centre **Manager, Deputy Principal, Chief Technical Instructor, Acting Principal, Laboratory Supervisor, Technical Instructor, Technical & Vocational Instructor, Senior Medical Laboratory Technician and Medical Laboratory Technician.**

Dr. Yousef has a **PhD degree in Natural Health Sciences** from the **University of Florida (USA)**, **Master's degree in Clinical Microbiology** and **Bachelor's degree with Honors in Microbiology**. Further, he has **Diploma** in Vocational Education (**UNRWA & UNESCO**) and received several **certifications** like **ICDL** and Training of Trainers (**TOT**) in **Cambridge University (England)**. He is an active **member of Jordan Medical Laboratories Society, Technical Accreditation Committee of Medical Laboratories (Jordan Institution & Metrology)** and the **Technical Accreditation Committee for Granting ISO 15189 Certificate**. Furthermore, he has also published numerous technical papers and books including **Medical & Diagnostic Microbiology, Practical Competencies in Medical Laboratory Technology, Safety in Medical Laboratory Science and Quality Control in Medical Laboratory Science** just to name a few.



Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will be always met:

Day 1

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Water Distribution Systems: Overview of Water Distribution System Components, including Source Water, Treatment Processes, Storage & Distribution Networks
0930 – 0945	Break
0945 – 1030	Hydrology & Water Resources: Basics of Hydrology, Water Cycle & Sustainable Water Resource Management
1030 - 1130	Water Quality Standards & Regulations: Understanding the Regulations Governing Water Quality & the Standards Water Distribution Systems Must Meet
1130 – 1230	Types of Pipes & Materials: An Overview of the Types of Materials Used for Pipes & Their Properties, including PVC, Ductile Iron & HDPE
1230 – 1245	Break
1245 – 1330	Hydraulics Fundamentals: Basic Principles of Fluid Mechanics as Applied to Water Distribution, including Pressure, Flow Rate & Head Loss
1330 - 1420	Design Considerations for Water Networks: Factors Affecting the Design of Water Distribution Networks, such as Demand Estimation, Network Layout & Redundancy
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 – 0830	Pumps & Pumping Stations: Types of Pumps Used in Water Distribution, Their Operation & the Design of Pumping Stations
0830 – 0930	Water Storage Facilities: Role of Storage in Water Distribution Systems, Types of Storage Facilities (Elevated, Ground & Reservoir) & Design Considerations
0930 – 0945	Break
0945 – 1100	Valves & Control Devices: Types of Valves (Gate, Butterfly, Check), Their Functions & the Use of Control Devices in Regulating Flow & Pressure
1100 – 1200	Water Meters & Flow Measurement: Principles of Water Metering, Types of Meters & Technologies for Flow Measurement & Monitoring
1200 – 1215	Break
1215 – 1315	SCADA Systems for Water Networks: Introduction to SCADA Systems & Their Application in Monitoring & Controlling Water Distribution Networks
1315 - 1420	Maintenance & Rehabilitation of Water Networks: Strategies for Preventive Maintenance, Inspection & Rehabilitation of Ageing Infrastructure
1420 – 1430	Recap
1430	Lunch & End of Day Two



Day 3

0730 – 0830	Network Modelling: Overview of Modelling Concepts & the Importance of Models in Planning & Managing Water Distribution Systems
0830 – 0930	Hydraulic Modelling of Water Distribution Networks: Techniques & Software Tools Used for Hydraulic Modelling, including Network Analysis & Simulation
0930 – 0945	Break
0945 – 1100	Water Quality Modelling: Understanding the Impact of Network Design & Operation on Water Quality, & Modelling for Contamination & Age Analysis
1100 – 1200	Demand Forecasting & Management: Methods for Predicting Water Demand & Managing Variations in Demand Across the Network
1200 – 1215	Break
1215 – 1330	Leak Detection & Loss Management: Techniques & Technologies for Detecting Leaks, Assessing Non-Revenue Water & Strategies for Loss Reduction
1130 - 1420	Case Studies on Network Analysis & Optimization: Real-World Examples of How Modelling & Analysis have been Used to Optimize Network Performance
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0830	Smart Water Networks: Exploration of Smart Water Technologies, including IOT Devices, Smart Sensors & Data Analytics for Efficient Network Management
0830 - 0930	Renewable Energy Integration: Discussing the Integration of Renewable Energy Sources in Water Network Systems for Sustainable Operation
0930 – 0945	Break
0945 – 1100	GIS Applications in Water Networks: Utilizing Geographic Information Systems (GIS) for Mapping, Asset Management & Spatial Analysis of Water Networks
1100 – 1200	Climate Change Impacts & Adaptation: Assessing the Impacts of Climate Change on Water Distribution & Strategies for Resilience & Adaptation
1200 – 1215	Break
1215 – 1330	Water Network Security & Emergency Preparedness: Approaches to Securing Water Networks Against Man-Made & Natural Threats & Emergency Response Planning
1330 - 1420	Emerging Materials & Technologies for Pipe Systems: Innovations in Materials Science & Engineering for Durable & Efficient Water Conveyance
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5

0730 – 0830	Regulatory Framework & Compliance: Overview of the Regulatory Landscape for Water Utilities, Including Compliance & Reporting Requirements
0830 – 0930	Environmental Considerations in Network Design: Incorporating Environmental Sustainability Principles into Water Network Design & Operation
0930 – 0945	Break

0945 – 1100	Community Engagement & Customer Service: Strategies for Effective Communication with Communities, Customer Service Best Practices & Handling Grievances
1100 – 1200	Economic & Financial Management: Fundamentals of Financial Planning, Cost Recovery & Investment Strategies for Water Networks
1200 – 1215	Break
1215 – 1300	Project Management for Water Network Projects: Key Principles of Project Management Applied to the Development & Rehabilitation of Water Networks
1300 - 1345	Workshop & Group Project: Participants Apply the Knowledge Gained through a Hands-On Group Project, Simulating the Planning & Analysis of a Water Distribution Network, Followed by Presentations & Discussions
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:



Course Coordinator

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