



COURSE OVERVIEW TE0268 Water System Operation & Optimization

Course Title

Water System Operation & Optimization

Course Date/Venue

August 25-29, 2024/Fujairah Meeting Room,
Grand Millennium Al Wahda Hotel, Abu Dhabi,
UAE

Course Reference

TE0268

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



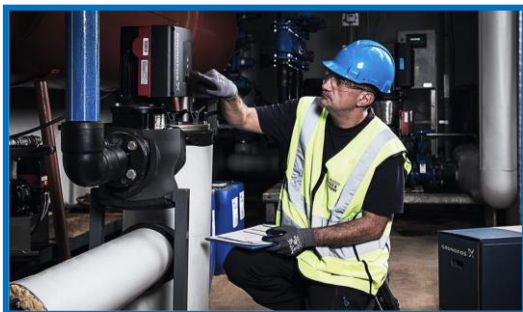
Course Description



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 System Operation and Optimization. It covers the water system components including supply sources, treatment facilities, storage and distribution networks; the fundamentals of water quality, standards and parameters crucial for maintaining safe drinking water; the hydraulics and fluid dynamics, system monitoring and data acquisition and energy management in water systems; and the regulatory compliance and safety protocols for water system operations.



Further, the course will also discuss the innovative treatment technologies; the process optimization for water treatment, sludge management and disposal, chemical handling and dosage optimization; the taste and odor control in water supplies; the emerging contaminants and removal technologies; the design and layout of distribution networks; the leak detection and loss management; and the pressure management, water storage optimization, pump operation and efficiency and asset management.



During this interactive course, participants will learn the sustainable water resource management and renewable energy integration; the climate resilience in water systems, water reuse and recycling; the smart water technologies to improve water system management and optimization; the cutting-edge technologies and their potential impact on water systems; the digital twins for system monitoring, simulation and optimization; the advanced data analytics and predictive maintenance; the strategies for engaging customers in water conservation efforts; the regulatory trends and future compliance challenges; and the strategic planning for future water system challenges.

Course Objectives

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

- Apply and gain an in-depth knowledge on water system operation
- Identify water system components including supply sources, treatment facilities, storage and distribution networks
- Discuss the fundamentals of water quality, standards and parameters crucial for maintaining safe drinking water
- Explain hydraulics and fluid dynamics, system monitoring and data acquisition and energy management in water systems
- Review the regulatory compliance and safety protocols for water system operations
- Recognize innovative treatment technologies and apply process optimization for water treatment, sludge management and disposal, chemical handling and dosage optimization
- Carryout taste and odor control in water supplies and discuss the emerging contaminants and removal technologies
- Illustrate the design and layout of distribution networks and apply leak detection and loss management
- Employ pressure management, water storage optimization, pump operation and efficiency and asset management
- Apply sustainable water resource management and renewable energy integration
- Carryout climate resilience in water systems, water reuse and recycling as well as smart water technologies to improve water system management and optimization
- Explore cutting-edge technologies and their potential impact on water systems
- Utilize digital twins for system monitoring, simulation and optimization
- Apply advanced data analytics and predictive maintenance including strategies for engaging customers in water conservation efforts
- Discuss regulatory trends and future compliance challenges as well as strategic planning for future water system challenges

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 system operation and optimization for water utility managers, engineers, water treatment plant operators, consultants, environmental scientists and researchers, professionals involved in water distribution and infrastructure maintenance

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. Tarek Samir, PhD, MSc, BSc, is a Senior Chemical Engineer and an International Expert in Analytical Laboratory with over 20 years of integrated industrial experience and academic experience as a University Professor. His expertise widely covers in the areas of Laboratory Practice, Analytical Measurement & Uncertainty, Uncertainty Estimation, Statistical Process Control (SPC), GC, GC/MS, HPLC, Validation Method, Laboratory Equipment, Laboratory Quality Management Systems (ISO 17025), Lab Safety & Health, Good Laboratory Practice (GLP), Water Pollution Control, Water Distribution Systems, Water Networking, Hydraulic Modelling Systems, Pumping Stations, Water Reservoirs, Water Storage Tanks, Water Treatment, Extended Activated Sludge Treatment, Water Analysis, Water Treatment Technology, MBBR, Hydraulic Design, Hydraulic Network System, Water Pipeline System, Water Distribution System, Water Quality Analysis, Steam Boiler, Hydro-Treating Technology, Water Storage Tanks, Quantitative & Qualitative Analysis of Organic Micro-Pollutants, Water Quality Management, Advanced Organic Material & Separation, Water Desalination, Oil Polluted Wastewater Treatment, Reverse Osmosis, Water Quality Assessment, Water Assurance & Quality Control and Measurement Uncertainty Estimation.

During Dr. Tarek’s career life, he has handled challenging positions wherein he has acquired his wide technical and practical experience in the field of process & chemical industry such as the **Professor, Associate Professor, Lead Auditor, Technical Expert, Technical Auditor, Assistant Researcher, Researcher and Senior Instructor/Lecturer** for various companies and universities such as the National Researcher Center, Van Hall Institute – Part of Wageningen University, Science Valley Academy and Benha University.

Dr. Tarek has a **PhD, Master and Bachelor** degrees in **Chemical Engineering**. Further, he is a **Certified Instructor/Trainer** and published numerous technical papers, patents and journals. He has further delivered numerous trainings, courses, seminars, conferences and workshops globally.

Course Program

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

Day 1: Monday, 25th of August 2024

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Water Systems: Introduction to Water System Components including Supply Sources, Treatment Facilities, Storage & Distribution Networks
0930 – 0945	Break
0945 – 1030	Water Quality Management: Fundamentals of Water Quality, Standards & Parameters Crucial for Maintaining Safe Drinking Water



1030 – 1130	Hydraulics & Fluid Dynamics: Basic Principles Affecting Water Flow in Pipes & Networks including Pressure Dynamics & Flow Rates
1130 – 1215	System Monitoring & Data Acquisition: Tools & Technologies for Real-Time Monitoring of Water Quality & System Performance
1215 – 1230	Break
1230 – 1330	Energy Management in Water Systems: Energy Usage in Water Systems & Strategies for Minimizing Consumption
1330 – 1420	Regulatory Compliance & Safety: The Legal Framework & Safety Protocols for Water System Operations
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2: Tuesday, 26th of August 2024

0730 – 0830	Innovative Treatment Technologies: Exploring Advanced Water Treatment Options such as Membrane Technologies, UV Disinfection & AOPs
0830 – 0930	Process Optimization for Water Treatment: Techniques for Enhancing the Efficiency & Effectiveness of Treatment Processes
0930 – 0945	Break
0945 – 1100	Sludge Management & Disposal: Best Practices in the Handling, Treatment & Disposal of Sludge from Water Treatment Plants
1100 – 1215	Chemical Handling & Dosage Optimization: Safe Chemical Handling Practices & Optimization of Chemical Dosages for Treatment
1215 – 1230	Break
1230 – 1330	Taste & Odor Control: Strategies for Managing Taste & Odor Issues in Water Supplies
1330 – 1420	Emerging Contaminants & Removal Technologies: Addressing Challenges Posed by Pharmaceuticals, Microplastics & Other Emerging Contaminants
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3: Wednesday, 27th of August 2024

0730 – 0830	Design & Layout of Distribution Networks: Principles Behind the Design & Optimization of Water Distribution Systems
0830 – 0930	Leak Detection & Loss Management: Techniques & Technologies for Detecting Leaks & Reducing Non-Revenue Water
0930 – 0945	Break
0945 – 1100	Pressure Management: Strategies for Optimizing Pressure to Reduce Leaks & Improve System Efficiency
1100 – 1215	Water Storage Optimization: Balancing Storage Capacity with Demand to Ensure Water Quality & Availability
1215 – 1230	Break
1230 – 1330	Pump Operation & Efficiency: Optimizing Pump Schedules & Operations for Energy Efficiency & Reliability
1330 – 1420	Asset Management: Techniques for Managing Water System Assets to Maximize Lifespan & Performance
1420 – 1430	Recap
1430	Lunch & End of Day Three



Day 4: Thursday, 28th of August 2024

0730 – 0830	Sustainable Water Resource Management: Strategies for Sustainable Sourcing & Utilization of Water Resources
0830 – 0930	Renewable Energy Integration: Opportunities for Incorporating Renewable Energy Sources into Water System Operations
0930 – 0945	Break
0945 – 1100	Climate Resilience in Water Systems: Adapting Water System Operations to Withstand Climate Change Impacts
1100 – 1215	Water Reuse & Recycling: Technologies & Systems for the Safe Reuse & Recycling of Wastewater
1215 – 1230	Break
1230 – 1330	Smart Water Technologies: Implementing IoT, AI & Data Analytics for Improved Water System Management & Optimization
1330 – 1420	Case Studies in Operational Improvements: Real-World Examples of Successful Water System Optimizations & Outcomes
1420 – 1430	Recap
1430	Lunch & End of Day Four

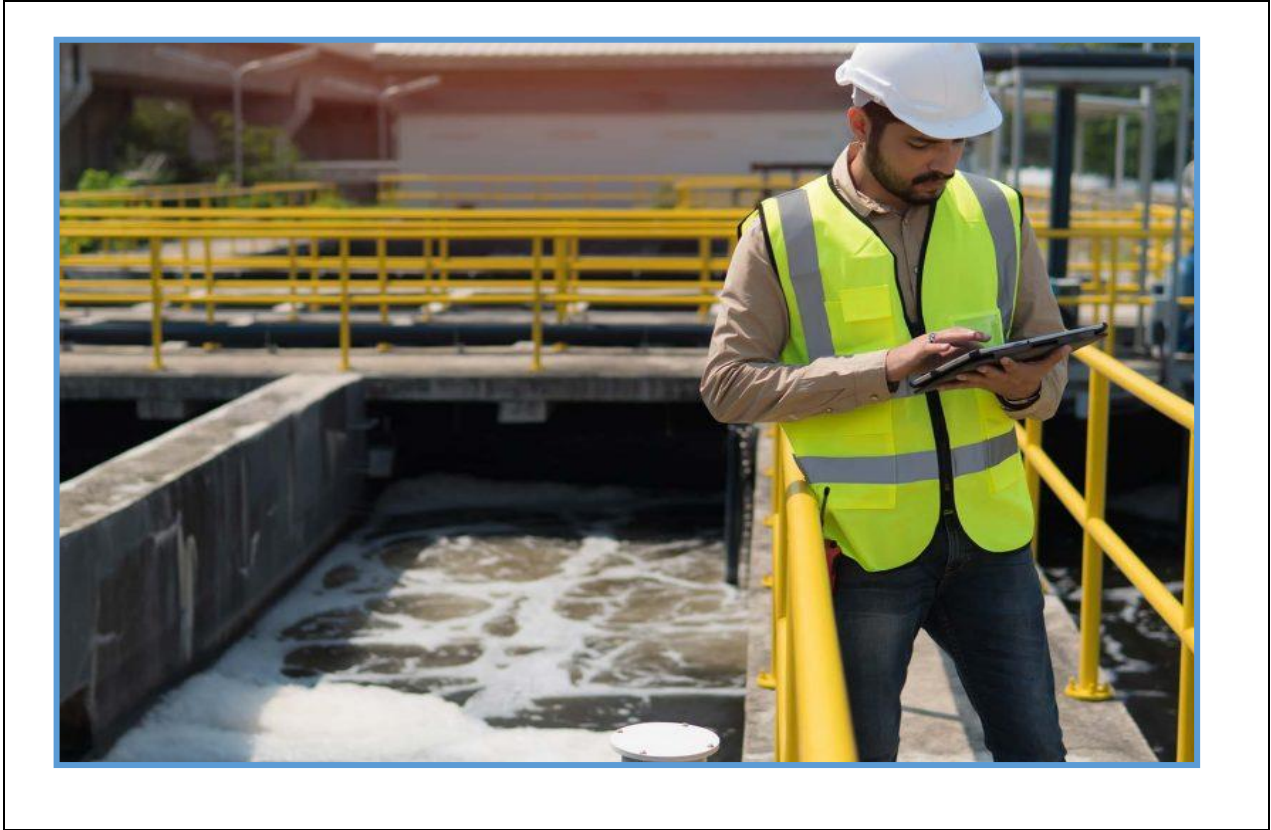
Day 5: Friday, 29th of August 2024

0730 – 0830	Innovations in Water System Technologies: Exploring Cutting-Edge Technologies & their Potential Impact on Water Systems
0830 – 0930	Digital Twin Technologies for Water Systems: Utilizing Digital Twins for System Monitoring, Simulation & Optimization
0930 – 0945	Break
0945 – 1100	Advanced Data Analytics & Predictive Maintenance: Leveraging Big Data for Predictive Maintenance & Operational Forecasting
1100 – 1230	Customer Engagement & Demand Management: Strategies for Engaging Customers in Water Conservation Efforts
1230 – 1245	Break
1245 – 1315	Regulatory Trends & Future Compliance Challenges: Upcoming Regulatory Changes & How to Prepare for Them.
1315 – 1345	Strategic Planning for Future Water System Challenges: Tools & Methodologies for Strategic Planning & Resilience Building
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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