COURSE OVERVIEW TE0308
Water Quality Management

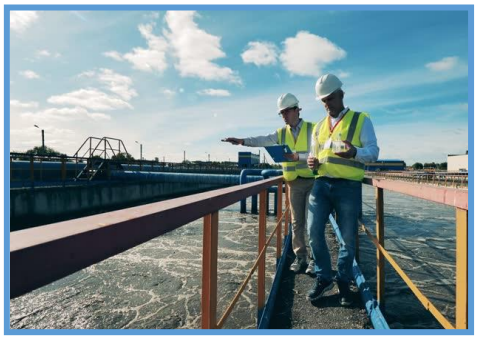
Course Title
Water Quality Management

Course Date/Venue
Session 1: September 01-05, 2025/Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: December 22-26, 2025/Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
TE0308

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Water Quality Management. It covers the water quality management framework, key physical parameters, chemical parameters, biological parameters and interactions between physical, chemical, and biological factors; the sampling methods and tools, laboratory analysis techniques, field measurement techniques and data recording and analysis; the regulatory standards for water quality; and the sources of water contamination and water quality management systems.

Further, the course will also discuss the water treatment processes, coagulation and flocculation, sedimentation and filtration, disinfection and chlorination as well as desalination and advanced treatment technologies; the types of residuals generated, residuals disposal and reuse strategies; the environmental impact of residual disposal and compliance with environmental regulations; the water distribution system design, water quality in distribution systems, hydraulic modeling and water quality; the corrosion and scaling in water distribution, water quality monitoring in distribution networks; and the emergency response for water quality issues.

During this interactive course, participants will learn the health impacts and environmental impacts of water quality; the integrated water resources management (IWRM), water reuse and recycling; the sustainable practices in water quality management and risk assessment and management in water quality; the impact of climate change on water quality and changes in precipitation patterns and water contamination; the climate resilience strategies in water management, climate adaptation and mitigation strategies; the remote sensing and drones for water quality monitoring, artificial intelligence and machine learning in water management; the importance of public communication in water quality issues and effective water quality communication strategies; and engaging the public in water conservation and quality management.

Course Objectives

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

- Apply and gain an in-depth knowledge on water quality management
- Discuss water quality management framework, key physical parameters, chemical parameters, biological parameters and interactions between physical, chemical, and biological factors
- Carryout sampling methods and tools, laboratory analysis techniques, field measurement techniques and data recording and analysis
- Review regulatory standards for water quality and identify the sources of water contamination and water quality management systems
- Illustrate water treatment processes, coagulation and flocculation, sedimentation and filtration, disinfection and chlorination as well as desalination and advanced treatment technologies
- Identify the types of residuals generated, residuals disposal and reuse strategies, environmental impact of residual disposal and compliance with environmental regulations
- Determine water distribution system design, water quality in distribution systems, hydraulic modeling and water quality
- Illustrate corrosion and scaling in water distribution, water quality monitoring in distribution networks and emergency response for water quality issues
- Identify the health impacts and environmental impacts of water quality and discuss integrated water resources management (IWRM), water reuse and recycling
- Implement sustainable practices in water quality management and risk assessment and management in water quality
- Discuss the impact of climate change on water quality and changes in precipitation patterns and water contamination
- Apply climate resilience strategies in water management, climate adaptation and mitigation strategies
- Use remote sensing and drones for water quality monitoring and artificial intelligence and machine learning in water management
- Discuss the importance of public communication in water quality issues, develop effective water quality communication strategies and engage the public in water conservation and quality management

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 conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of water quality management for environmental engineers & scientists, water treatment plant operators and technicians, health, safety and environment (HSE) officers, facility and utility managers, municipal and government authorities, quality assurance & quality control (QA/QC) inspectors, public health specialists and hygiene officers and industrial plant operators.

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.

Accommodation

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

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.

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: -

- 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.

- 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.

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:

Mr. Nikolas Karnavos, MSc, BSc, is an **International Expert** in **Water Treatment Technology** with over **35 years** of extensive experience within the **Oil**, **Gas**, **Refinery** and **Petrochemical** industries. His expertise widely covers **Wastewater Treatment**, **Oilfield Water Treatment**, **Best Practice in Sewage & Industrial Wastewater Treatment & Environmental Protection**, **Treating & Handling Oily Water**, **Water Chemistry for Power Plant**, **Industrial Water Treatment** in Refineries & Petrochemical Plants, **Water Pollution Control**, **Permitting & Enforcing Drilling for Groundwater**, **Hydraulic Modelling**, **Water** Network Design, **Reverse Osmosis Treatment Technology** and **Chlorination System**. Further, he is also well-versed in Laboratory Control of a **Wastewater Treatment Plant**, Environmental Online Analyzers (**Air** & **Water**), Gas Chromatography and various instrumental methods of analysis such as **Water Analysis & Quality Control**, **Water and Wastewater Chemical** Analysis, Statistical Data and Laboratory Analysis, Gas Analysis, Qualitative Fuel Analysis, Environmental Chemical Analysis, Laboratory Environmental Analysis including **Water Quality Testing**, **Water Testing** (**ICP & Ion Chromatography**), **Process Water** and **Wastewater Effluents**, Oily **Sludge Treatment**, Atomic Absorption and Spectroscopic Methods in Analytical Chemistry, **Analytical Method Development** and **Methods of Environmental Measurements** (**Water**, **Air**, **Liquid** & **Solid Wastes**).

Mr. Karnavos was the **Laboratory Manager** of **Exxon** wherein he was responsible for **ISO 17025 certification**, upgrading laboratory equipment in **refinery**, **petrochemical** and **polypropylene** plants, upgrading and extending LIMS, handling the transition plan process of the existing laboratory to a new as well as formulating and executing the plans for applied research and technology transfer. During his career life, he had occupied several significant positions as the **Laboratory Analyst**, **Laboratory Professor**, **Quality Manager**, **Partner & Managing Director**, **Environmental Engineer**, **Process Engineer**, **Environmental Management Corporate Department Head** and **Quality Control & Plastics Application Head** with different international companies like the **AQUACHEM**, **Hellenic Petroleum** (**EXXON**) and **Technological Institute**.

Mr. Karnavos holds a **Master** degree in **Chemical Engineering** and **Bachelor** degrees in **Mechanical Engineering** and **Petroleum Engineering** from the **Aristotelian University of Thessaloniki**, **Technological Institute** and **KATEE Kavala** respectively. He is an **Accredited Trainer** for the Organization for the Certifications & Vocational Guidance (**EOPPEP**) and an **Accredited Environmental Auditor** from the **IEMA**. Further, he is the **President** of Greek **Association of Chemical Engineers** and an active member of various professional engineering bodies internationally like the **IEMA**, **Technical Chamber** of Greece and the **CONCAWE**. He also **published numerous books** and **scientific papers** and delivered various trainings and workshops worldwide.

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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Water Quality Management*** *Importance of Water Quality Management • Key Regulations and Standards • The Water Quality Management Framework • Global versus Local Water Quality Concerns*
0930 – 0945	*Break*
0945 – 1030	***Physical, Chemical & Biological Water Quality Parameters*** *Key Physical Parameters (Temperature, Turbidity, Color) • Chemical Parameters (Ph, Dissolved Oxygen, Conductivity) • Biological Parameters (Microbial Content, Pathogens) • Interactions Between Physical, Chemical and Biological Factors*
1030 – 1130	***Water Quality Monitoring Techniques*** *Sampling Methods and Tools • Laboratory Analysis Techniques • Field Measurement Techniques • Data Recording and Analysis*
1130 – 1215	***Regulatory Standards for Water Quality*** *Local Regulations and Guidelines (UAE Water Quality Regulations) • International Standards (WHO, EPA) • Water Quality Certification Requirements • Compliance Strategies*
1215 – 1230	*Break*
1230 – 1330	***Sources of Water Contamination*** *Point Source Pollution versus Non-Point Source Pollution • Industrial, Agricultural and Urban Runoff • Wastewater Discharge • Natural Contamination Factors*
1330 – 1420	***Water Quality Management Systems*** *Frameworks for Water Quality Management • Decision-Making Tools and Risk Assessments • Water Quality Management Strategies • Continuous Improvement Models (PDCA Cycle)*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Overview of Water Treatment Processes*** *Types of Water Treatment (Primary, Secondary, Tertiary) • Goals and Objectives of Water Treatment • Key Principles of Water Treatment • Overview of Treatment Plant Operations*
0830 – 0930	***Coagulation & Flocculation*** *The Process and Purpose of Coagulation and Flocculation • Chemical Coagulants and their Types • Flocculation Basin Design and Operation • Troubleshooting Common Issues in Coagulation*
0930 – 0945	*Break*

0945 – 1100	***Sedimentation & Filtration*** *Sedimentation Process and Design • Types of Sedimentation Tanks and Clarifiers • Filtration Methods (Rapid Sand Filters, Activated Carbon Filters) • Maintenance and Performance Monitoring*
1100 – 1215	***Disinfection & Chlorination*** *Disinfection Methods (Chlorination, Ozone, UV) • Disinfection By-Products and Health Considerations • Chlorine Dosing and Control • Advanced Disinfection Technologies*
1215 – 1230	*Break*
1230 – 1330	***Desalination & Advanced Treatment Technologies*** *Reverse Osmosis and its Applications • Desalination Process and Challenges • Advanced Oxidation Processes (AOP) • Membrane Filtration Technologies*
1330 – 1420	***Water Treatment Residuals Management*** *Types of Residuals Generated (Sludge, Spent Filters, Spent Chemicals) • Residuals Disposal and Reuse Strategies • Environmental Impact of Residual Disposal • Compliance with Environmental Regulations*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Water Distribution System Design*** *Overview of Distribution Network Design • Types of Water Distribution Systems • Key Design Considerations (Flow Rates, Pressure) • Geographic Information Systems (GIS) in Distribution Design*
0830 – 0930	***Water Quality in Distribution Systems*** *Factors Affecting Water Quality in Pipelines • The Role of Pipe Materials (Steel, PVC, Cast Iron) • Microbial Regrowth in Distribution Systems • Contamination Risks in Water Distribution*
0930 – 0945	*Break*
0945 – 1100	***Hydraulic Modeling & Water Quality*** *Principles of Hydraulic Modeling • Water Quality Modeling in Distribution Networks • Simulation of Contamination and Recovery Scenarios • Case Studies of Water Quality Modeling*
1100 – 1215	***Corrosion & Scaling in Water Distribution*** *Causes of Corrosion in Pipes • Types of Corrosion and their Effects • Corrosion Control Strategies • Scaling and its Impact on System Efficiency*
1215 – 1230	*Break*
1230 – 1330	***Water Quality Monitoring in Distribution Networks*** *Real-Time Water Quality Monitoring • Key Parameters to Monitor in Distribution Systems • Water Quality Sensors and Technology • Managing Water Quality Data for Decision-Making*
1330 – 1420	***Emergency Response for Water Quality Issues*** *Contingency Planning for Water Contamination • Rapid Response Protocols • Public Notification Systems • Case Study of Recent Water Quality Emergencies*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Health Impacts of Water Quality*** *Pathogens in Water and Associated Diseases • Waterborne Diseases (Cholera, Dysentery, Typhoid) • Water Quality Indicators for Public Health • Public Health and Safety Regulations*
0830 – 0930	***Environmental Impacts of Water Quality*** *Eutrophication and Algal Blooms • Impact on Aquatic Ecosystems (Bioaccumulation, Biodiversity Loss) • Water Quality and Wetland Health • Environmental Risk Assessments*
0930 – 0945	*Break*
0945 – 1100	***Integrated Water Resources Management (IWRM)*** *Principles of IWRM • Sustainable Water Quality Management • Stakeholder Engagement and Policy Frameworks • Case Studies of IWRM in Practice*
1100 – 1215	***Water Reuse & Recycling*** *Types of Water Reuse (Direct and Indirect) • Benefits and Challenges of Water Recycling • Treatment Technologies for Recycled Water • Regulations for Recycled Water Use*
1215 – 1230	*Break*
1230 - 1330	***Sustainable Practices in Water Quality Management*** *Best Practices for Sustainable Water Quality Management • Low-Impact Development Strategies • Green Infrastructure in Water Management • The Role of Policy in Promoting Sustainability*
1330 – 1420	***Risk Assessment & Management in Water Quality*** *Identifying Water Quality Risks • Risk Assessment Methodologies (HAZOP, FMEA) • Mitigating Risks Through Management Strategies • Crisis Management in Water Quality Incidents*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

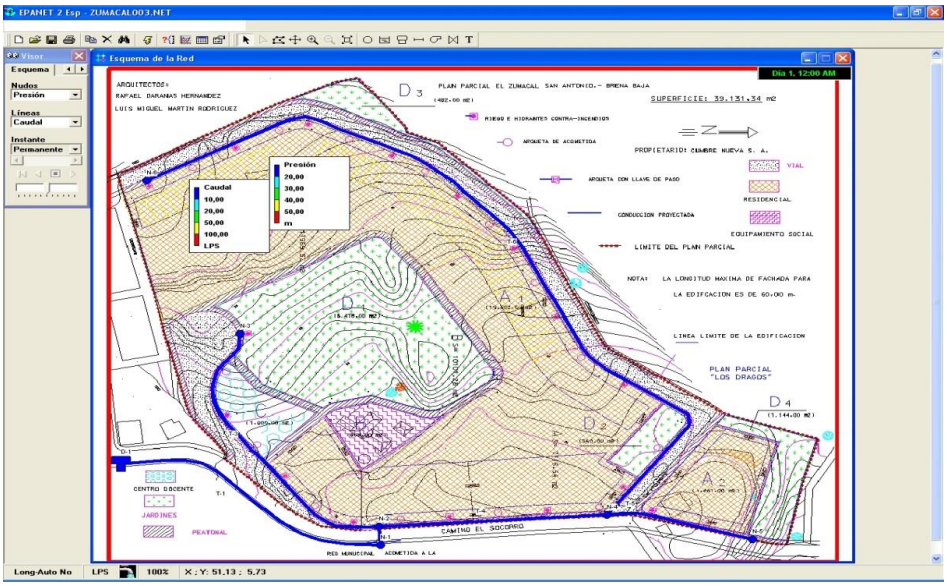
Day 5

0730 – 0830	***Case Study: Water Quality Management in Arid Regions*** *Challenges of Water Quality Management in Arid Climates • Innovative Solutions for Water Scarcity • Water Quality Monitoring Systems in Arid Regions • Government Policies and Regulatory Challenges*
0830 – 0930	***Case Study: Urban Water Quality Management*** *Managing Water Quality in Growing Urban Areas • Stormwater Management and Urban Runoff • Addressing Pollution in Urban Water Systems • Smart Technologies for Urban Water Quality*
0930 – 0945	*Break*
0945 – 1100	***Water Quality & Climate Change*** *The Impact of Climate Change on Water Quality • Changes in Precipitation Patterns and Water Contamination • Climate Resilience Strategies in Water Management • Climate Adaptation and Mitigation Strategies*
1100 – 1230	***Emerging Technologies in Water Quality Management*** *Remote Sensing and Drones for Water Quality Monitoring • Artificial Intelligence and Machine Learning in Water Management • Smart Water Quality Sensors and IoT Solutions • The Future of Water Quality Management*

1230 – 1245	*Break*
1245 – 1345	***Water Quality Risk Communication*** *Importance of Public Communication in Water Quality Issues • Developing Effective Water Quality Communication Strategies • Crisis Communication During Water Contamination Events • Engaging the Public in Water Conservation and Quality Management*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the latest revision of "EPANET" simulators.



EPANET Simulator

Course Coordinator

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