COURSE OVERVIEW LE0062
Water Ageing Analysis

Course Title
Water Ageing Analysis

Course Date/Venue
December 16-20, 2024/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
LE0062

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

Course Description

This practical and highly-interactive course includes real-life case studies 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 Ageing Analysis. It covers the components and operation of water distribution systems; the fundamentals of water ageing and chemical properties of water; the physical and hydraulic properties of water systems; the microbiological considerations in water ageing and the regulatory standards for water quality; the sampling and monitoring strategies, laboratory analysis for water ageing and the use of tracers in ageing analysis; the computational models used to simulate water age; and the geographic information (GIS) for mapping and analyzing water distribution networks.

During this interactive course, participants will learn the system design and operational practices to reduce water age; the water storage to minimize ageing; the pipeline materials and water ageing; the active water quality management and biofilm formation; the emerging technologies in water ageing management; the impact of climate change on water ageing; the renewable energy sources; the data analytics and machine learning algorithms to predict the water ageing in distribution systems; the public health implications of water ageing; the water ageing management plan; and the latest equipment used in sampling, monitoring and analyzing water quality.

Course Objectives

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

- Apply and gain an in-depth knowledge on water ageing analysis
- Identify the components and operation of water distribution systems
- Discuss the fundamentals of water ageing and recognize the chemical properties of water including physical and hydraulic properties of water systems
- Explain the microbiological considerations in water ageing and the regulatory standards for water quality
- Carryout sampling and monitoring strategies, laboratory analysis for water ageing and the use of tracers in ageing analysis
- Discuss the computational models used to simulate water age and identify critical points in the system
- Apply geographic information (GIS) for mapping and analyzing water distribution networks
- Optimize system design and operational practices to reduce water age
- Manage water storage to minimize ageing and identify pipeline materials and water ageing
- Apply active water quality management, address biofilm formation and discuss the emerging technologies in water ageing management
- Explain the impact of climate change on water ageing and integrate renewable energy sources
- Apply data analytics and machine learning algorithms to predict and manage water ageing in distribution systems
- Discuss public health implications of water ageing and develop a water ageing management plan
- Demonstrate the latest equipment used in sampling, monitoring and analyzing water quality

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 ageing analysis for environmental engineers, civil engineers, material scientists, chemists, industrial professionals, regulatory professionals, researchers and academics.

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: -

- 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.

- 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 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 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. Paul Patsi, MSc, BSc, is a **Senior Analytical Chemist** and an **International Expert** in **Water & Waste Water Treatment Technology** with over **25 years** of extensive experience in **Analytical Laboratory** and **Water & Wastewater Treatment Engineering**. His expertise covers **Laboratory Assessment**, **Microbiological Quality Assurance**, **Analytical Chemistry**, **Statistical Analysis**, **Laboratory Safety**, **Equipment & Infrastructure Management**, **Budgeting & Planning of Laboratory Consumables**, **Business Administration**, **Personnel Management**, **Laboratory Management**, **Chemical Analysis**, **Laboratory Auditing**, **Risk Assessment**, **Microbiological Analysis of Water & Waste Water**, **Waste Water Treatment Analysis**, **Water Chemistry**, **HACCP**, **ISO 22000**, **ISO 17025**, **ISO 9001**, Good Manufacturing Practice (**GMP**), Good Hygiene Practice (**GHP**) and Good Laboratory Practice (**GLP**). He is also an expert in microbiological indoor air quality, water biology, food sampling and calibration. He is currently the **Head of Industrial Analytical Laboratory** of PINDOS wherein he is in-charge of the budgeting, auditing, consumables, suppliers, personnel management, equipment and infrastructure management along with waste water treatment and water/environmental legislation.

During his career life, Mr. Paul has held key positions such as the **Head of Microbiology & Chemical Laboratory**, **Head of Quality Control**, **Technical Consultant**, **Research Projects Specialist**, **Scientific Consultant**, **Biologist-Scientific Expert** and **Biologist** for multi-billion companies like the **European Union**, **Help LTD**, **Lake Pamvotis Municipality Company**, **Hellenic Centre for Marine Research**, **Cargill** and **Nestle** just to name a few.

Mr. Paul has a **Master's** degree in **Food Science and Food Technology** from the **University of Ioannina** (**Greece**) and a **Bachelor's** degree in **Biology** from the **Aristotle University of Thessaloniki** (**Greece**). He is a **Certified Instructor/Trainer** and a **Member** of the **Society for Applied Microbiology**, **Society of Biological Scientist** and the **Global Coalition for Sustained Excellence in Food & Health Protection**.

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 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 16th of December 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Water Distribution Systems**: Introduction to the Components & Operation of Water Distribution Systems including Sources, Treatment, Storage & Distribution*
0930 – 0945	*Break*
0945 – 1030	***Fundamentals of Water Ageing**: Understanding What Water Ageing is, Factors Influencing it & its Implications on Water Quality*
1030 – 1130	***Chemical Properties of Water**: Basic Chemistry of Water & How it Interacts with Materials Found in Distribution Systems*
1130 – 1215	***Physical & Hydraulic Properties of Water Systems**: The Hydraulic Considerations in Water Distribution including Flow Rates, Pressure & Stagnation*
1215 – 1230	*Break*
1230 – 1330	***Microbiological Considerations in Water Ageing**: Impact of Water Ageing on Microbial Growth & Biofilm Formation within Distribution Systems*
1330 – 1420	***Regulatory Standards for Water Quality**: Introduction to the Regulatory Framework Governing Water Quality including Guidelines for Maximum Residence Times*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Tuesday 17th of December 2024***

0730 – 0830	***Sampling & Monitoring Strategies**: Designing Effective Sampling Programs to Monitor Water Age & Quality throughout the Distribution Network*
0830 – 0930	***Laboratory Analysis for Water Ageing**: Techniques for Analyzing Chemical, Physical & Microbiological Parameters Indicative of Water Ageing*
0930 – 0945	*Break*
0945 – 1100	***Use of Tracers in Ageing Analysis**: Introduction to the Use of Tracers & Dyes to Study Water Movement & Age Within Distribution Systems*
1100 – 1215	***Modeling Water Age in Distribution Systems**: Computational Models Used to Simulate Water Age & Identify Critical Points in the System*
1215 – 1230	*Break*
1230 – 1330	***GIS & Spatial Analysis in Water Distribution**: Applying Geographic Information Systems (GIS) for Mapping & Analyzing Water Distribution Networks*
1330 – 1420	***Case Studies on Water Ageing Analysis**: Reviewing Real-World Examples of Water Ageing Analysis & the Outcomes of Interventions*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

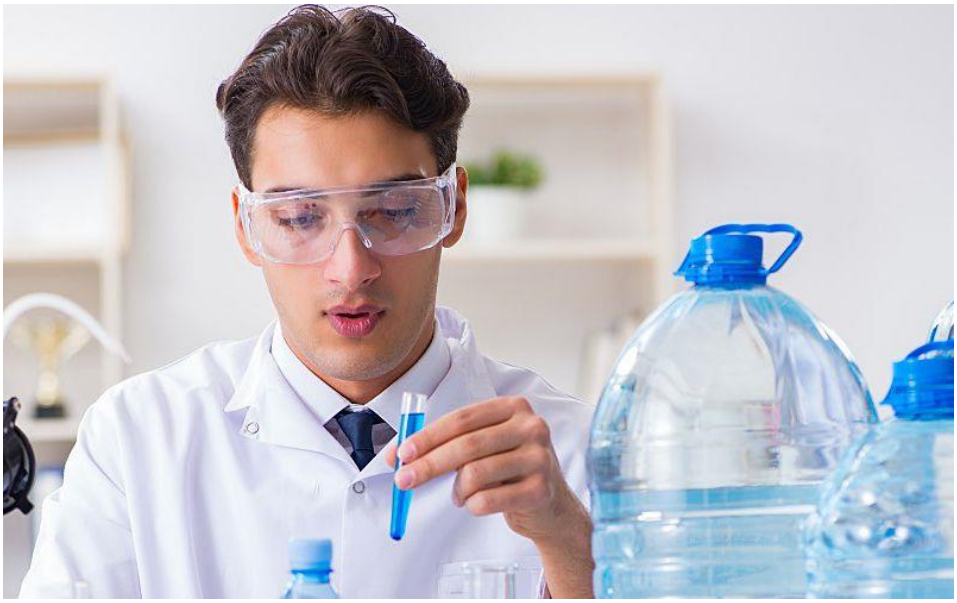
Day 3:	Wednesday 18th of December 2024
0730 – 0830	***System Design & Operational Practices to Minimize Water Age:*** *Strategies for Optimizing System Design & Operational Practices to Reduce Water Age*
0830 – 0930	***Tank Management for Water Age Control:*** *Techniques for Managing Water Storage to Minimize Ageing including Tank Mixing & Turnover*
0930 – 0945	*Break*
0945 – 1100	***Pipeline Materials & Water Ageing:*** *Effects of Different Pipeline Materials on Water Quality & Strategies for Material Selection & Replacement*
1100 – 1215	***Active Water Quality Management:*** *Methods for Active Water Quality Management in Distribution Systems including Booster Chlorination & Aeration*
1215 – 1230	*Break*
1230 – 1330	***Addressing Biofilm Formation:*** *Strategies for Preventing & Controlling Biofilm Formation Related to Water Ageing*
1330 – 1420	***Emerging Technologies in Water Ageing Management:*** *Exploration of New Technologies & Approaches for Managing Water Age including Smart Distribution Technologies*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4:	Thursday 19th of December 2024
0730 – 0830	***Impact of Climate Change on Water Ageing:*** *Discussing How Climate Change & Extreme Weather Events can Affect Water Distribution Systems & Water Age*
0830 – 0930	***Integrating Renewable Energy Sources:*** *Examining the Role of Renewable Energy Sources in Powering Active Water Quality Management Systems*
0930 – 0945	*Break*
0945 – 1100	***Data Analytics & Machine Learning:*** *Applying Data Analytics & Machine Learning Algorithms to Predict & Manage Water Ageing in Distribution Systems*
1100 – 1215	***Public Health Implications of Water Ageing:*** *Exploring the Link Between Water Ageing & Public Health Outcomes including Strategies for Risk Communication*
1215 – 1230	*Break*
1230 – 1330	***Case Studies on Innovative Solutions to Water Ageing:*** *Reviewing Innovative Global Case Studies on Managing Water Ageing & Improving Water Quality*
1330 – 1420	***Roundtable Discussion on Water Age Challenges:*** *Facilitating an Open Discussion on Challenges Faced by Participants in Managing Water Age & Sharing Best Practices*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5:	***Friday 20th of December 2024***
0730 – 0830	***Workshop on Water Ageing Analysis Tools**: Hands-On Workshop Introducing Participants to Software & Tools Used in Water Ageing Analysis*
0830 – 0930	***Developing a Water Ageing Management Plan**: Guidance on Creating Effective Management Plans to Address Water Ageing in Distribution Networks*
0930 – 0945	*Break*
0945 – 1230	***Water Quality Monitoring Equipment Demonstration**: Demonstration of the Latest Equipment Used in Sampling, Monitoring & Analyzing Water Quality*
1230 – 1245	*Break*
1245 – 1345	***Group Project on Water Ageing Analysis**: Participants Work in Groups to Analyze a Hypothetical Water Distribution System & Propose Management Strategies*
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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