

Water Quality Management and Effluent Treatment

Presented by the Department of Chemical Engineering, University of Pretoria

5 ECSA CPD Points | 5 SACNASP CPD Points

The **Water Quality Management and Effluent Treatment** short course presents a comprehensive overview of the water management, water allocation, and water pollution prevention legislation and modern methods for parameter analysis and water quality monitoring. The course lecturers present well researched material covering the basics of water quality analysis, determination of suitability of use, and pollutant impact mitigation. Most importantly, the course presents information on the required paradigm shift from Wastewater Treatment and Resource Recover and strategies for integration of ecological systems during wastewater and effluent treatment. The lecturers present an overview of the most recent electronic catchment management systems and WQ information database management is presented as part of the modern methods for achieving IWRM using modern tools. The course includes a field trip (facility visit) and hands-on laboratory sessions to familiarize delegates to the most recent analytical methods for water quality evaluation. The course is designed to equip professionals in the water sector with knowledge that will prove useful in both management and technological, and operation decision making to safeguard the water resources of Southern Africa.

Course content

The course will cover the following topics:

WATER MANAGEMENT AND ASSESSMENT ASPECTS

- Global and Regional water sources, allocation, use, hydrology and geohydrology
- Roman Water Law and water allocation principles
- National Water Act and other regulatory requirements
- Physical water quality parameters
- Chemical water quality parameters
- Biological water quality parameters
- Water Use during Pandemics: COVID-19 Case Study
- End of the pipe and In-Stream water quality standards
- Introduction to standard lab analysis: TSS, Faecal Coliform, DO, BOD5, COD, F⁻, Cl⁻, toxic metals, organic pollutants, etc.
- Introduction to advanced lab analysis: IC-LC/QTOF, HPLC, GC-MS, AAS, TOC, COD Analyser, UV/Vis Spectrophotometer,
- Introduction to remote (electronic) monitoring and telemetry use in Integrated Water Resources Management (IWRM)

EFFLUENT TREATMENT PROCESSES

- Overview of conventional water treatment processes
- Overview of conventional wastewater treatment processes
- Wastewater Reclamation and Treatment of Impaired Waters – Membrane Systems and Ion-Exchange

- Low cost and ecological friendly water supply systems
- Advanced wetland applications
- Biological Nutrient Removal
- Attached Growth Systems
- Solids treatment and disposal
- Energy and resource recovery from the wastewater treatment processes
- Water Reclamation and Reuse – EPs, EDCs and the Three-Barrier philosophy – uncoupling the Water-Energy nexus

TREATMENT PROCESSES

- Overview of conventional water treatment processes
- Overview of conventional wastewater treatment processes
- Wastewater Reclamation and Treatment of Impaired Waters – Membrane Systems and Ion-Exchange
- Field Trip
- Monitoring Protocols for Large Water Works
- Case Study: poorly managed systems
- Case Study: better-managed systems
- Case Study: Low-cost sanitation systems
- Effluent disposal – impact on aquatic systems
- Solids treatment and disposal – impact on groundwater systems
- Energy and resource recovery from the wastewater treatment processes
- Water Reclamation and Reuse – EPs, EDCs and the Three-Barrier philosophy – uncoupling the Water-Energy nexus

Shifting knowledge to insight



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Learning outcomes

After successfully completing this course, delegates will have a better understanding of the basic sciences involved in water quality management

Course duration

The course will be presented for five (5) consecutive contact days.

Course fees

R16 500.00 (VAT Incl.) per delegate

Course fee include all course material. Course fees must be paid in full 14 days prior to course start date. Proof of payment can be submitted to enrolments@enterprises.up.ac.za

Who should enrol?

This course is ideal for you if you are active in the field including consulting engineers or water/environmental scientists and practitioners within the Southern African water sector or developing countries experiencing water challenges due to increasing industrialisation and urbanisation. All active water sector artisans and professionals will benefit from this course.

Entry requirements

All persons active in the Water Sector are eligible for enrolment into this course. The background knowledge required to follow the content of this course include work experience, a diploma or degree including fundamentals of physics, chemistry and microbiology, and/or participation in design and management of water and wastewater infrastructure of Southern Africa.

Assessment

Delegates will be assessed through the submission of an individual assignment.

Accreditation and certification

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Registration and enquiries

Client Information Centre

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