



Dept. of Civil Engineering | Masters module | CPD course

# Steady State Design of Biological Nutrient Removal Systems

14 – 18 October 2024



# Introduction



## The Master's Programme

The primary aim of the M (Eng) and MSc (Eng) specialising in Water Quality Engineering is to produce graduates with the necessary knowledge and skills to engage effectively in theory, design, modelling and operation of biological and chemical wastewater and sludge treatment systems.

The primary objective of the M(Eng) and MSc(Eng) specialising in Water Quality Engineering is to produce engineers and scientists with high-level and in-depth knowledge and understanding of bioprocess engineering so that they can competently and effectively use steady state and dynamic simulation models for the

design and operation of municipal wastewater treatment plants comprising primary treatment, BNR activated sludge, secondary settling tanks, flotation thickening and stabilisation of waste sludge by aerobic and/or anaerobic digestion unit operations in a plant wide integrated way.

Upon completion of this curriculum the modern approach of modelling and simulation to wastewater treatment plant design and operation can be embraced with deeper insight, advanced knowledge, and greater confidence.

## Continuing Professional Development

Modules of this master's programme are offered to Continuing Professional Development delegates from which a participant can obtain CPD credits. Please note: If you are interested in attending this course for credit purposes towards MSc degree, you will need to formally register for the MSc Programme or as an occasional student. If you attend the course as a CPD participant, credit cannot be claimed in retrospect. A certificate of attendance will be awarded to CPD participants. Participants need to attend 80% of the lectures to qualify for an attendance certificate.

## Who Should Attend

The course is best suited for Water and Wastewater Treatment Professionals, including Engineers and Scientists, Consultants, Contractors, Operators, Project managers, City and Public Works Officials, Urban Planners, and other design professionals who deal with issues related to wastewater treatment. A level 8 qualification in Engineering (or science fields related to water) is required.

## Format

This course will be presented in a hybrid format i.e. face-to-face, and online over 5 days. The face-to-face presentations/lectures will take place in the Postgraduate Seminar Room, level 3, New Engineering Building, upper campus, UCT. Online participants are expected to have computer access with good Wi-Fi or data reception and will be responsible for ensuring they have backup systems during loadshedding. Further information will be available in the week before the course starts.

## Course Content

This advanced course in sewage sludge treatment includes: an introduction to sewage sludge reuse and disposal guidelines in South Africa; characterization of primary and waste activated sludge in the context of mass balances over the entire wastewater treatment plant; sludge thickening with gravity sedimentation and flotation; development and validation of steady state aerobic digestion model for primary and waste activated sludge stabilisation and application to design and analysis including oxygen transfer and sludge thickening considerations; kinetics, stoichiometry and weak acid/base chemistry of anaerobic digestion; development, validation and application of steady state anaerobic digestion model, generation of sludge treatment liquors and the impact of their recirculation on effluent quality, and nutrient (N and P) reduction in sludge treatment liquors; biosolids handling and design principles (conditioning, dewatering, composting, conveyance, storage); resource recovery from sludge and biosolids.

## Course Convenor

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A/Prof David Ikumi, a senior lecturer in the Department of Civil Engineering at UCT, is a leader in sustainable water resource management. His expertise lies in developing and applying mathematical models to optimize Water Resource Recovery Facilities (WRRFs). Prof Ikumi's research focuses on creating WRRFs that are not only efficient but also environmentally friendly, with a consideration for social and economic factors alongside environmental impact.

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## Overview

<b>Course</b>	Steady State Design of Biological Nutrient Removal Systems,CIV5048Z
<b>Duration</b>	14 – 18 October 2024
<b>Venue</b>	PG Seminar Room, NEB, Upper Campus, University of Cape Town <b>or</b> online
<b>CPD</b>	5 CPD points, ECSA registration number: <i>UCTWQEDBNRS24</i>
<b>Fees</b>	Standard fee: R16 500 (5-day course) * UCT student fee: R8 250
<b>Entrance requirements</b>	Level 8 qualification in Engineering (or science fields related to water), which includes Recognition of Prior Learning (RPL) - in the case of RPL the submission of a portfolio (with evidence of professional responsibilities and skills) and referee reports may be required.

\*10% discount will apply if the course is attended online only

# Registration

## Registration and Cancellation

- [Register for this course](#)
- Registration covers attendance of all sessions of the course and course material.
- Registrations close one week before the start of the course. Confirmation of registration will be sent on receipt of a registration form.
- **Cancellations must be received one week before the start of a course, or the full course fee will be charged.**
- For more information on application and registration procedures, please visit our website: [www.cpd.uct.ac.za](http://www.cpd.uct.ac.za)

## Certificates and CPD Points

A certificate of attendance will be awarded to CPD participants. Participants need to attend 80% of the lectures to qualify for an attendance certificate.

The ECSA validation number for this course is: UCTWQEDBNRS24.

CPD participants can also request a formal university transcript, which will show this course as part of a Professional Development Career.

Please note: If you are interested in attending this course for credit purposes, you will need to register for the master's programme or as an occasional student. If you attend the course as a CPD participant, credit cannot be claimed in retrospect.

## Contact details

For more information or details on CPD courses, visit our website or contact us.

**Web:** [www.cpd.uct.ac.za](http://www.cpd.uct.ac.za)

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