



Dept. of Civil Engineering | Masters module | CPD course

## Groundwater

29 September – 3 October 2025



**UNIVERSITY OF CAPE TOWN**  
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD



# Introduction



## The Master's Programme

The Master's Programme with a specialisation in Geotechnical Engineering is intended to support high level training and enhance both the technical skills of recent graduates or experienced personnel who work in, or aspire to a career in civil engineering construction, consulting, environmental and related industries. The primary purpose of the programme is to provide advanced conceptual understanding, detailed factual geotechnical knowledge and specialist technical skills appropriate for postgraduates who wish to widen their professional scope and work towards a career in the field of geotechnical engineering. For further information about this master's programme

please visit the website: [Geotechnical Engineering | Civil Engineering-](#)

## Continuing Professional Development

Modules of this master's programme are offered to Continuing Professional Development delegates. Five individual block release modules are offered in 2025. Continuing Professional Development students may take each module as a separate certificate course. CPD students are required to attend the lectures but are not required to submit assignments or write the exam.

## Who Should Attend

The courses are best suited for Civil Engineers, Consultants, Architects, Engineering Geologists, Geotechnical Engineers and Geologists, Bridge Engineers, Landscape Architects, Contractors, Soil Scientists, Project managers, City and Public Works Officials, City Planners, and other design professionals who address construction related issues.

## Format

Each module is structured in the following way: a week of intensive contact time at UCT, comprising formal lectures, class assignments and seminars/tutorials.

Please note: these courses are currently planned to be presented face-to-face over 5 days but may be attended online for those who cannot attend in person.

## Course Content

With the increasing demands on water supply from dwindling number of water resources due to frequent occurrence of droughts as new normal, dependency on only surface water is no longer tenable in the short and long term. The situation is further exacerbated by the rapidly increasing population and rising living standards associated with high water use. To mitigate the impact of water scarcity, alternative sources such as groundwater are needed. In line with this, the course intends to prepare participants to understand groundwater as a resource and build capacity of engineers to diversify the sources for potable water supply. This is critical in a South African context as many smaller towns, particularly in the interior, rely solely on groundwater for their water supply. The course thus aims to introduce physical principles of groundwater, properties of subsurface materials, groundwater flow, and groundwater geology. The course is intentionally interdisciplinary, weaving important theories and methods from groundwater hydrology and geology. Topics to be covered include Characterization of groundwater systems; Water source; Well design and completion; Groundwater flow and contamination; Groundwater protection; Remediation; Groundwater monitoring; Software used in groundwater studies; etc.

## Course Presenters



**Dr. John Okedi, PrEng, PhD** is the convener of the Groundwater course. He holds a BSc Civil Engineering from Makerere University, MSc degree in Water Resources Engineering from KU Leuven and a PhD (Civil) from UCT. Dr. Okedi is a full-time employee of the University of Cape Town where he is a convener of two undergraduate programmes *i.e.*, Engineering Hydrology and Urban Water Services. He is also a convener of 3 post-graduate courses *i.e.*, Groundwater, Urban Hydrology & Modelling Urban Drainage Systems, and Hydrological measurements with IoT. He has over 15 years' experience in industry and academia. Research interests include groundwater, alternative 'non-conventional' water resources for water scarce countries, research with big data, Internet of Things (IoT), application of Real-Time Control on hydrological systems, and coastal reservoirs. He is a professional engineer registered with ECSA (Reg No. 202001361), with key industry experience including civil engineering design and project management, construction supervision and operations, quantitative data analysis and modelling. Work on groundwater is mainly focused on Managed Aquifer Recharge for abstraction and water supply.





**Dr. Gaathier Mahed** is a Senior Lecturer and Deputy Dean in the Faculty of Science at Nelson Mandela Metropolitan University. He holds a BSc, BSc (Hon) and MSc in Environmental Science from the University of Western Cape, and PhD in Geology from Nelson Mandela Metropolitan University. He is a registered Natural Scientist with SACNASP with an extensive background in Hydrogeology and a focus on fractured rock. He has received technical training in aspects of Geophysics and Isotopes in Germany and Morocco, the latter sponsored through the International Atomic Energy Agency. He has worked in gold, uranium and coal mining as well as on shale gas research. He has served in his capacity as a consultant on various projects in the Earth Sciences for government, industry and academia. Some of the major companies he has completed worked for include SABIC, City of Cape Town and the Water Research Commission. Gaathier has also tenured as COO for a diversified energy start-up firm which ventured into Biofuel, Shale Gas and Drilling. Gaathier also occupies voluntary executive and non-executive board positions at various companies and NGO's. One of the former voluntary positions he occupied was with Awqaf South Africa, where he gained valuable knowledge and insights into the NGO sector as well as charitable endowments. Dr Mahed also served on the International Association of Hydrogeologists Early Career Network as a steering committee member as well as on the Young Earth Scientist's Network as the CFO and Vice President for Career Advancement.



**Ms Hilja Ndakola** holds a BSc in Civil Engineering from the University of Namibia (UNAM), and an MSc (Eng) in Civil Engineering from the University of Cape Town (UCT), South Africa. She is currently pursuing a PhD in Civil Engineering at UCT focusing on groundwater modeling to enhance water management and climate change resilience. Her expertise includes hydrology, stormwater management, and groundwater modeling. Hilja is dedicated in advancing water systems engineering through innovative solutions and professional excellence.

## Overview

<b>Course Dates</b>	29 September – 3 October 2025
<b>Delivery format</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>UCTGTEGWR25</i>
<b>Fees</b>	Standard fee: R17 300 UCT student fee: R8 650
<b>Geotechnical engineering CPD courses 2025</b>	Laboratory and Field Techniques CIV5110Z: 24 – 28 Feb Foundation Design CIV5114Z: 5 – 9 May Ground Improvement Techniques CIV5111Z: 4 – 8 Aug Soil Modelling and Numerical Methods CIV5150Z: 7 – 11 Jul Groundwater CIV5153Z: 29 Sep – 3 Oct

# 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 digital certificate of attendance will be awarded to CPD participants. Participants need to attend 80% of the lectures to qualify for an attendance certificate. For further information on digital certificates please visit [Digital Certificates at UCT](#)

According to guidelines set out by the Engineering Council of South Africa, attendance of this course will earn participants 5 points towards Category 1 (Developmental Activities). The ECSA validation number for this course is *UCTGTEGWR25*.

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.

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**Web:** <http://www.cpd.uct.ac.za>

**E-mail:** [ebe-cpd@uct.ac.za](mailto:ebe-cpd@uct.ac.za)

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