



Dept. of Civil Engineering | CPD Courses

Geotechnical Engineering

Masters Modules 2023



Introduction



The Masters 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: <http://www.civil.uct.ac.za/msc-engineering-specialising-geotechnical-engineering>

Continuing Professional Development

Modules of this master's programme are offered to Continuing Professional Development delegates as 5 separate certificate courses from which a participant can obtain CPD credits. All the courses consist of 5 days of formal lectures at the University of Cape Town.

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 currently structured in the following way: 5 days of intensive contact time at UCT, comprising formal lectures.

Please Note: The format of each course may change, and either be delivered online or in a hybrid format (some online lectures and some face-to-face lectures).



Laboratory and Field Techniques

CIV5110Z: 20 – 24 February 2023

This course aims to develop an advanced understanding of laboratory and field techniques. Topics include: Laboratory methods: role and scope of laboratory tests; fundamentals of stress-strain and strength measurements; stresses, pore pressures and strains; transducers and control systems; practical applications. The theoretical and practical aspects of in situ tests in geotechnical engineering. Tests discussed include: dynamic cone penetrometer standard penetration test, field vane, piezocone, dilatometer, pressuremeter etc. Geophysical methods are also included. Emphasis on use of in situ test results for determining engineering properties of soil for design. Field instrumentation; settlement gauges; extensometers; inclinometers; piezometers; geotechnical data correlation charts; measurements of in-situ stresses and permeability's; etc. are also covered.

5 CPD points, ECSA validation No: UCTGTEFLT23

Foundation Design

CIV5114Z: 17 – 21 April 2023

This course aims to furnish participants with the necessary knowledge and design skills required to ensure stability of both the ground, and any structure built in or on the ground. It will introduce participants to the application of theories of soil mechanics, applied mathematics and physics to provide solutions to the serviceability and ultimate limit states of geotechnical structures. Topics include: review of soil mechanics; working stress approach, limit state design; analysis and design of shallow and deep foundations; determination of settlement of structures; use of foundation design standards such as Eurocodes, SANS 10160; etc.

5 CPD points, ECSA Validation No: UCTGTEFDN23

Ground Improvement Techniques

CIV5111Z: 19 – 23 June 2023

As more structures are being constructed, it has become increasingly difficult to find sites with suitable soil properties. The properties at many sites must be improved using some form of soil improvement methods. Therefore, the aim of the course is to introduce participants to the concepts underpinning a range of ground improvements and soil remediation techniques and an appreciation of how these techniques are applied in practice. The course covers important design and construction aspects associated with ground improvement techniques including Mechanical methods (compaction, vibrotechniques); Hydraulic methods (groundwater lowering, preloading, vertical drains, electro-osmosis); Physical/chemical methods (admixtures, grouting, deep soil mixing, ground freezing); Inclusions (rigid inclusions, soil reinforcements); Contaminated land and remediation; etc.

5 CPD points, ECSA Validation No: UCTGTEGIT23

Soil Modelling and Numerical Methods

CIV5150Z: 28 August – 1 September 2023

Numerical analyses of geotechnical engineering problems are becoming more and more commonplace in industrial practice. Complex problems dealing with elasto-plastic behaviour of soil under drained and undrained conditions require numerical analysis for implementing proper design. It is necessary to identify the appropriate soil constitutive model and the model parameters that should be used for analysis of different field problems. At the same time, it is necessary to understand the fundamentals behind the appropriate use of these soil constitutive models in numerical schemes for solving different field problems. This course provides an introduction to the different soil constitutive models and their use in numerical analysis.

5 CPD points, ECSA Validation No: UCTGTESMNM23

Groundwater

CIV5153Z: 9 – 13 October 2023

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.

5 CPD points, ECSA Validation No: UCTGTGWR23

Overview

Programme	Geotechnical Engineering	
Modules and duration	Laboratory and Field Techniques	20 – 24 February 2023
	Foundation Design	17 – 21 April 2023
	Ground Improvement Techniques	19 – 23 June 2023
	Soil Modelling and Numerical Methods	28 August – 1 September 2023
	Groundwater	9 – 13 October 2023
Venue	Postgraduate Seminar Room, level 3, New Engineering Building, UCT or online	
CPD	CPD points and ECSA codes as indicated per module	
Participants	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	
Fees	Standard fee: R15 700 UCT staff and student fee: R7 850	

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

Registration

Registration and Cancellation

- [Register for this course](#)
- Registration covers attendance of all course sessions and the electronic copies of the course notes.
- Registrations close one week before the start of the course. Confirmation of acceptance 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/cpd/registration-policies

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.

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 or as an occasional student. For further information about the Master's Programme, please contact rowen.geswindt@uct.ac.za

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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