



UNIVERSITY OF CAPE TOWN  
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD  
ENGINEERING & THE BUILT ENVIRONMENT



TRANSNET

# Concrete Technology

In person at UCT, 21 – 23 January 2025



UNIVERSITY OF CAPE TOWN  
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SPES BONA

# Introduction



Engineers are required to make reasonable assumptions and provide economical solutions for the design of reinforced concrete structures. An important part of this process is the choice of appropriate concrete material properties and the relevant specification of mix constituents, mix proportions and construction methods.

Modern design methods usually involve the use of software packages in which predefined values for relevant concrete properties, such as strength and deformation characteristics, are made. Accepting such predefined assumptions without accounting for specific project requirements, and site conditions may result in conservative and uneconomic design of reinforced concrete structures. In addition, innovative and modern

types of concrete are often not considered in the design process as many structural engineers have limited knowledge of fundamental concrete materials technology.

The workshop will refresh the engineer's and technician's knowledge and understanding of concrete properties to enable him/her to rationally specify economic design solutions for reinforced concrete structures. Based on fundamental aspects of concrete materials technology, the workshop will discuss design procedures and constituent material choices for general and specific requirements. Important properties such as strength and strength development, elastic deformations, shrinkage and creep, and durability will be discussed. The presentations cover fundamental materials aspects, design methods, test procedures and prediction models for concrete properties.

The underlying aims of the workshop are to highlight the importance of materials in the design and performance of concrete structures and to facilitate a good understanding of modern concrete technology in order to promote economic and sustainable design of reinforced concrete structures.

The workshop will include classroom lectures, discussions and practicals, and laboratory work (demonstrations, hands-on experience in concrete manufacture and testing). Depending on availability, a site visit may be included.

## Who should attend?

- Structural engineers involved in the design of reinforced concrete members and structures
- Practitioners and site staff involved in the construction of reinforced concrete members and structures
- Agency and public sector engineers responsible for reinforced concrete projects
- Students and academics

# Course Content

- Critical review of common design assumptions and code provisions (SABS and EN)
- Cement types and hydration process (principles, property development, hydration heat), highlighting how to influence hydration and property development through the choice of constituent materials and mix parameters
- Modern admixtures for concrete: types, applications, and limitations
- Fresh concrete properties and quality control
- Compressive strength of concrete (design assumptions, strength classes, influencing factors, prediction models, performance assessment)
- Tensile and flexural strength (common values, relationship between compressive and tensile strength, significance in design, test methods)
- Concrete behaviour under load (deformation principles, failure and fracture)
- Elastic properties (importance and relevance, design assumptions and prediction models, test methods, material influences)
- Shrinkage and creep (importance in design, structural effects, design assumptions and prediction models, test methods and their limitations, material influences)
- Special requirements for concrete (early age properties, workability, strength development, heat of hydration)
- Concrete durability (overview on deterioration mechanisms, design for durability, material choice, prediction models and test methods)
- Overview on special concretes (self-compacting concrete, high strength concrete)

# Course Outcomes

At the end of the course the participants should:

- Understand the constituents of concrete and their influence on the properties of concrete
- Have a good understanding on the various construction methods used with concrete
- Be able to specify a concrete mix design and select adequate constituent materials
- Be able to specify relevant fresh and hardened concrete properties and understand how they relate to the performance of concrete structures
- Be able to specify relevant performance tests for structural concrete and interpret the results
- Understand the importance of durability of concrete structures and design structures with adequate service life according to environmental exposure classes

# Course Presenter



Prof. Hans Beushausen is a researcher and lecturer in the fields of structural engineering, construction material technology, structural condition assessment, and concrete repair technology at the University of Cape Town. He is a member of the Concrete Materials & Structural Integrity Research Unit ([CoMSIRU](#)) at UCT, which focuses on infrastructure performance and renewal research. His research interests include modern and sustainable concrete technology, concrete durability, performance assessment of concrete structures, repair systems for concrete structures, and bonded concrete overlays. [View profile](#).

# Course Overview

<b>Name</b>	Concrete Technology	
<b>Duration</b>	21 – 23 January 2025	
<b>Venue</b>	TBC, Upper Campus, UCT	
<b>CPD</b>	3 CPD points, ECSA Validation No: UCTCTY25	
<b>Participants</b>	Structural engineers, practitioners, agency and public sector engineers involved in the design of reinforced concrete members and structures. Students and academics	
<b>Entry requirements</b>	Minimum NQF7 qualification in Engineering, Built environment or relevant sector	
<b>Fees</b>	Standard delegate: R12 800.00	Full-time student: R6400

# Registration

## Registration and Cancellation

- [Register online](#)
- Registration covers attendance of all sessions of the workshop, teas and lunches, and a set of 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](#).

## 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](#)

This course is registered with the Engineering Council of South Africa (ECSA) for the award of 3 CPD points. The ECSA course validation code is: UCTCCT25

## Contact details

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

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