



Dept. of Civil Engineering | CPD course

Concrete Technology

for Engineers and Technicians

Presented in person in Cape Town: 27 – 29 October 2025



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD



Introduction



Engineers and technicians are required to make reasonable assumptions and provide economical solutions for the design of reinforced concrete structures such as bridges, culverts, buildings, and industrial and civil infrastructure. 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.

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

- Concrete mix composition and materials
- Fresh and hardened concrete properties
- 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
- Quality control of concrete
- Construction methods
- Compressive strength of concrete (design assumptions, strength classes, influencing factors, prediction models)
- 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)
- Special concretes (self-compacting concrete, high strength concrete, high performance concrete)

Course Outcomes

At the end of the course the participants will:

- Understand the various constituents of concrete
- Design a concrete mix based on clear performance criteria
- Understand the various concrete construction methods, their application and limitations
- Be able to perform quality control during concrete manufacture and construction
- Specify relevant tests for fresh and hardened concrete
- Select suitable concrete mixes for durable structures

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

Name	Concrete Technology
Duration	27 – 29 October 2025
Venue	Cape Town
CPD	3 CPD points, ECSA Validation No: UCTCTY25
Participants	Structural engineers, practitioners, agency and public sector engineers involved in the design of reinforced concrete members and structures. Students and academics
Entry requirements	Minimum NQF7 qualification in Engineering, Built environment or relevant sector
Fees	R13 568

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: UCTCTY25

Contact details

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

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