UNIVERSITY OF CAPE TOWN

CPD Courses on High-Rise Buildings & Earthquake Engineering

Design of High-Rise Buildings: 2.0 CPD Credits

Cape Town: 05 & 06 May 2025 (Mon & Tue)
Johannesburg: 08 & 09 May 2025 (Thu & Fri)

Design of Structures for Earthquake Resistance: 2.0 CPD Credits

Cape Town: 27 & 28 Oct 2025 (Mon & Tue)
Johannesburg: 30 & 31 Oct 2025 (Thu & Fri)

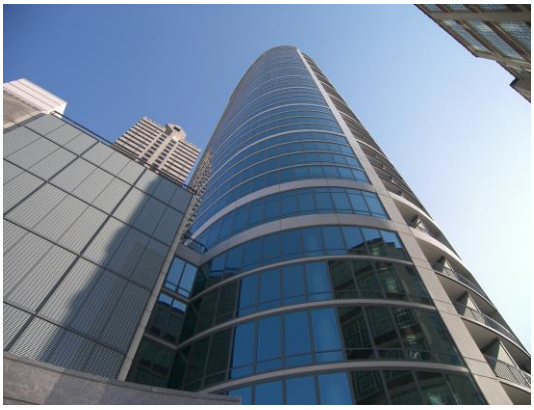
1. Design of High-Rise Buildings

Presenter: Prof. Kourosh Kayvani, Australia

Multi-storey buildings are a major part of modern infrastructure, where they provide cost-effective solutions for residential and commercial purposes, including offices, shops, car parks, healthcare and educational facilities. They range from low and medium-rise buildings of 3 to 15 storeys, high-rise buildings (multi-storey buildings that exceed 15 storeys), to tall buildings (multi-storey buildings that exceed 40 storeys). Multi-storey buildings need to be properly designed in order to resist loads from various actions such as self-weight and imposed floor loads, wind loading and other dynamic loads.

This course will present a systematic approach to the design of high-rise buildings in concrete and steel, from conceptual design and coverage of various structural systems, to advanced structural analysis, computational modelling and simulation of structural behaviour, detailed design in concrete and steel, and construction considerations. The course is intended not only for those with limited experience of multi-storey building design, but also for experienced engineers wishing to extend their skills and capabilities into the range of high-rise and tall-building construction.

This 2-day course, presented by a leading authority on high-rise buildings from Australia, will be of interest to all civil/structural engineers who may be required to design or supervise the construction of multi-storey buildings ranging from 3 storeys to 40 storeys. Delegates will also gain a sound appreciation of the special considerations that apply to the design of tall buildings.

Course Outline

- Historical Development of High-Rise Construction
- Introduction to Modern High-Rise Buildings: Office, Residential and Mixed-Use
- Conceptual Design of High-Rise Buildings
- Wind Actions on High-Rise Buildings
- Seismic Actions on High-Rise Buildings
- Structural Analysis of High-Rise Buildings under Lateral Loads
- Special Design Considerations for Tall Buildings
- Construction Considerations for High-Rise Buildings

2. Design of Structures for Earthquake Resistance

Presenter: Prof. Amr Elnashai, USA

Every now and then, severe earthquakes occur around the world, causing massive damage to infrastructure, and killing people. A grim reminder of this reality was the Turkey-Syria earthquake of February 2023, in which over 50,000 people lost their lives, and damage to infrastructure was estimated at over US$100 billion. The year 2024 saw two large earthquakes around the world: the 1 January Japan earthquake of magnitude M7.5, which killed 250 people and caused billions of dollars of damage, and the 3 April Taiwan earthquake of magnitude M7.4, which killed 18 people.

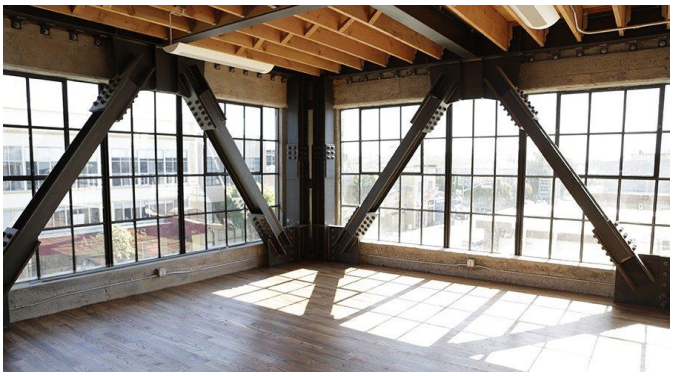
There are many other earthquakes that occur on a smaller scale, but nevertheless causing significant damage to buildings and other infrastructure. Southern Africa is fortunate to have relatively low natural seismic activity, but earthquakes are very unpredictable, and in the South African context, seismic movements can also be caused by mining-related underground explosions and extensive rock excavations. It is therefore desirable to incorporate some level of seismic robustness in the design of our more important (or more vulnerable) infrastructure such as hospitals, power stations, high-rise residential apartments, tall towers, tunnels and long-span bridges, depending on their location.

This 2-day course, presented by a leading authority on earthquake engineering from the USA, will explain how earthquakes are caused, and cover the analysis of structures for seismic loading, as well as the design of buildings to withstand earthquakes, including code provisions.

All civil/structural engineers who may be required to design new infrastructure for earthquake resistance, or assess the seismic capacity of existing infrastructure, are invited to attend.

Course Outline

- Free Vibration Response; Resonance; Damping
- Forced Vibration Response; General Methods of Dynamic Analysis
- Causes of Earthquakes; Quantification of Ground Motions; Case Studies
- Seismic Response; Laboratory & Full-Scale Testing; Seismic Analysis
- Principles of Earthquake Engineering; Choice of Materials & Structural Systems
- Seismic Design; Seismic Control; Damping; Base Isolation; Code Provisions
- Seismic Assessment of Existing Buildings; Retrofitting Strategies



3. About the Presenters

Design of High-Rise Buildings: Prof. Kourosh Kayvani, Australia

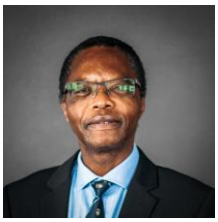
Prof. Kourosh Kayvani (Australia) has 30 years experience as a consulting structural engineer, executive leader and educator. He has played leading roles in the design and delivery of many innovative, complex and award-winning projects across the globe. His project portfolio includes Wembley Stadium in London, West Kowloon Terminus in Hong Kong, Barito Suspension Bridge in Indonesia, and a string of high-profile projects in Australia (ANSTO OPAL nuclear reactor; the Sydney Hockey Stadium; Brookfield Place in Perth; Melbourne Star Observation Wheel; Civic Tower, Liberty Place, 5 Martin Place and Bankwest Stadium in Sydney). He specialises in long-span structures, tall buildings, stadiums, seismic design and forensic engineering. He is a Chartered Professional Engineer, a Fellow of the Institution of Engineers (Australia), and a Fellow of the Australian Academy of Technology and Engineering

(ATSE). Prof. Kayvani is a Laureate of the IABSE Prize, awarded by the International Association for Bridge and Structural Engineering for his work on long-span structures worldwide. He is the winner of the 2016 John Connell Gold Medal from the Structural College of the Institution of Engineers (Australia). He has also been listed by Engineers Australia as one of the Top 100 Most Influential Engineers in Australia.

Design of Structures for Earthquake Resistance: Prof. Amr Elnashai, USA

A Fellow of the British Royal Academy of Engineering, Professor Amr Elnashai has most recently been the Vice President for Research and Technology Transfer at the University of Houston in the USA. Previously, Prof. Elnashai served as Dean of Engineering at the Pennsylvania State University, where he held the Harold and Inge Marcus Chair and the Woodward Chair in the College of Engineering. He has been visiting professor at the University of Surrey, UK, since 1997. Other visiting professor appointments include the University of Tokyo, the University of Southern California, and the European School for Advanced Studies in Reduction of Seismic Risk, Italy. Prof. Elnashai is founder and editor-in-chief of the Journal of Earthquake Engineering, a member of the drafting panel of the European design codes, past chair of the UK earthquake engineering association, and member of Council of the UK Institution of Structural Engineers. His technical interests are multi-resolution distributed analytical simulations, network analysis, large-scale hybrid testing and field investigation of the response of complex structures to earthquakes. He has produced numerous publications, including earthquake-investigation fields reports, three books and several book chapters. He holds MSc and PhD degrees from Imperial College London, and a BSc Eng degree from Cairo University.

Courses Convenor: Prof. Alphose Zingoni, University of Cape Town



Prof. Alphose Zingoni leads the Structural Engineering & Mechanics Group at the University of Cape Town. He holds MSc and PhD degrees in Structural Engineering from Imperial College London. He conducts research in the area of structural mechanics, with a focus on shell structures, vibration analysis, structural dynamics and novel computational methods. He has authored 4 books, edited another 7, and published over 100 scientific papers on these topics. He is the founder of the International Conference on Structural Engineering, Mechanics and Computation (SEMC), held at UCT every 3 years. In 2016, he was elected a Fellow of UCT for "original distinguished academic work." His book "*Shell Structures in Civil and Mechanical Engineering*" (ICE Publishing, London, 2018) won the UCT Book Award for 2019. In 2023, he was awarded the A1 rating by the National Research Foundation (NRF) of South Africa, for his internationally leading research. He is registered as a Chartered Engineer (CEng) with the Engineering Council of the UK, and as a Professional Engineer (PrEng) with the Engineering Council of South Africa. He is a Fellow of the Institution of Structural Engineers (London), a Fellow of the International Association of Bridge & Structural Engineering (Zurich), a Member of the Academy of Sciences of South Africa and a Fellow of the South African Academy of Engineering.

4. Registration

The registration fee is R12,900-00 per course. This covers participation in all sessions of the course, printed course notes and a CPD certificate. There is a 20% discount for full-time postgraduate students. The registration form may be requested via the contact details below.

5. Contact persons

General/Technical Queries: Prof. A. Zingoni, PrEng, CEng, PhD, DIC, FSAAE, FIABSE, FIStructE (Course Convenor). Department of Civil Engineering, EBE Faculty, University of Cape Town. *Email*: alphose.zingoni@uct.ac.za

Registration Queries: Heidi Tait, CPD Manager, EBE Faculty, Univ. of Cape Town. *Email*: heidi.tait@uct.ac.za