



CIVIL ENGINEERING AND CONSTRUCTION TRAINING

Seismic and Dynamic Analysis of Structures

5 day course

Classroom, online or in-house

Course overview

Floors that bounce under footfall, machine bases that resonate and buildings in earthquake zones share one cause: a structure answering a load that changes with time. This course builds the dynamics needed to predict that answer. Delegates start with the oscillator, a single mass on a spring, and its natural frequency, damping and resonance, then progress to models with many modes and modal superposition. Earthquake loading is treated through response spectra, the equivalent lateral force method and the seismic provisions of SANS 10160 and Eurocode 8, with attention to the East African Rift and to tremors induced by mining in South Africa. Ductility, capacity design and irregularity are explained as design choices. Vibration serviceability for floors, footbridges and plant supports completes the programme. Delegates leave able to run, check and interpret a dynamic analysis.

What you will learn

- Calculate natural frequency and damped response of a simple oscillator
- Explain resonance and dynamic amplification under harmonic and impulsive loads
- Perform modal analysis and combine modal responses for multi storey structures
- Apply response spectrum and equivalent lateral force methods to SANS 10160 and Eurocode 8
- Evaluate regional seismic hazard including rift zone and mining induced events
- Apply ductility, capacity design and regularity principles to lateral force systems
- Assess floors, footbridges and machine foundations for vibration serviceability

Who should attend

- Structural engineers designing buildings and industrial structures
- Engineers designing machine foundations and equipment supports
- Bridge and footbridge designers
- Engineers working in seismically active East African countries
- Mining structural engineers dealing with induced tremors

Course outline

- 01 The single mass oscillator
- 02 Damping, resonance and dynamic amplification
- 03 Multiple modes and modal superposition
- 04 Seismic hazard in the African context
- 05 Response spectra and equivalent lateral force
- 06 Ductility, capacity design and irregularity
- 07 Code provisions in SANS 10160 and Eurocode 8
- 08 Floor, footbridge and machine vibration

Upcoming dates

Dates	Venue	Format	Fee per delegate
12 to 16 October 2026	Accra, Ghana	Classroom	USD 1,325
26 to 30 October 2026	Online	Online	R8,500
7 to 11 December 2026	Gaborone, Botswana	Classroom	R19,950
21 to 25 December 2026	Cape Town, South Africa	Classroom	R19,950



Fees and how to register

This 5 day course is **R8,500** per delegate online, **R19,950** in the classroom in South Africa, Botswana, Namibia, Lesotho and Eswatini, and **USD 1,325** in the classroom elsewhere in Africa. In-house training is quotation on request. Book 2 or more delegates on this course and save 10%.

To register or request an in-house proposal, visit www.afrisciencegroup.com, email info@afri-science.co.za, or WhatsApp us on **+27 63 479 1136**.

AfriScience Group | +27 61 536 6531 | info@afri-science.co.za | Pretoria, Gauteng, South Africa