



## Programme in Structural Engineering and Materials

Convenor: A/Prof Hans Beushausen, Tel: 021-650 5181 / email: [hans.beushausen@uct.ac.za](mailto:hans.beushausen@uct.ac.za)

CIV5108Z: Advanced Mechanics of Materials Feb - June 2013	16 HEQF credits at level 9
CIV5002Z: Structural Concrete Properties & Practice Sep 2013 (block course)	16 HEQF credits at level 9

CIV5113S: Structural Dynamics with Applications TBA	16 HEQF credits at level 9
CIV5112S: Stability & Design of Steel Structures 11 - 15 Mar 2013	16 HEQF credits at level 9

## Programme in Geotechnical Engineering

Convenor: Dr Denis Kalumba, Tel: 021-650 2590 / email: [denis.kalumba@uct.ac.za](mailto:denis.kalumba@uct.ac.za)

CIV5111F: Ground Improvement Techniques 18 - 22 Feb 2013	16 HEQF credits at level 9
CIV5114Z: Foundation Design 3 - 07 June 2013 1 week block release	16 HEQF credits at level 9

CIV5110S: Laboratory & Field Techniques 08 - 12 July 2013	16 HEQF credits at level 9
--	----------------------------

## Programme in Transport Studies

Convenor: A/Prof Roger Behrens, Tel: 021-650 4757 / email: [roger.behrens@uct.ac.za](mailto:roger.behrens@uct.ac.za)

END5038Z: Integrated Land Use-Transport Planning 28 Jan - 04 Feb 2013	20 HEQF credits at level 9
END5045Z: Intermodal Public Transport Planning & Economics 11 - 18 Mar 2013	20 HEQF credits at level 9
END5035Z: Management of Transport Supply & Demand 22 - 29 Apr 2013	20 HEQF credits at level 9
END5067Z: Rail Planning & Operations Management 20 - 27 May 2013	20 HEQF credits at level 9

END5047Z: Transport Demand Analysis & Project Assessment 03 - 10 June 2013	20 HEQF credits at level 9
END5068Z: Bus Planning & Operations Management 04 - 11 Nov 2013	20 HEQF credits at level 9
END5048Z: Transport Modelling 14 - 21 Oct 2013	20 HEQF credits at level 9
END5036Z: Local Area Transport Planning, Management & Design 16 - 23 Sept 2013	20 HEQF credits at level 9

## Programme in Urban Infrastructure, Design and Management

Convenor: A/Prof Romano Del Mistro, Tel: 021-650 2605 / email: [romano.delmistro@uct.ac.za](mailto:romano.delmistro@uct.ac.za)

CIV5064Z: Urban Transitions in the Global South 04 - 08 Mar 2013	20 HEQF credits at level 9
END5042Z: Sustainable Urban Systems 13 - 17 May 2013	20 HEQF credits at level 9
END5043Z: Community Development 12 - 16 Aug 2013	20 HEQF credits at level 9

CIV5065Z: Urban Renewal 09 - 13 Sep 2013	20 HEQF credits at level 9
CIV5107Z: Integrated Urban Water Management 28 Oct 2013	20 HEQF credits at level 9
CIV5121Z: Design & Modelling of Water Distribution Systems 04 - 08 Mar 2013	20 HEQF credits at level 9

## Programme in Civil Infrastructure Management and Maintenance

Convenor: Prof Pilate Moyo, Tel: 021-650 2592 / email: [pilate.moyo@uct.ac.za](mailto:pilate.moyo@uct.ac.za)

All lectures held on Mondays & Thursdays from 17:00 to 19:30

CIV5116Z: Durability & Condition Assessment of Concrete Structures 11 - 15 Feb 2013	20 HEQF credits at level 9
CIV5067Z: Advanced Infrastructure Management 15 - 19 Apr 2013	20 HEQF credits at level 9

CIV5115Z: Bridge Management & Maintenance 24 - 28 June 2013	20 HEQF credits at level 9
CIV5120Z: Repair & Rehabilitation of Concrete Structures 02 - 06 Sep 2013	20 HEQF credits at level 9

## General Courses

MEC5063Z: An Introduction to Finite Elements Feb - June 2013	12 HEQF credits
---	-----------------

MEC5064Z: Finite Element Analysis July - Sep 2013	12 HEQF credits
--	-----------------

- ❖ Dates and times of courses may change, please confirm with the department prior to course commencement.
- ❖ Further information is also available on our website: [www.civil.uct.ac.za](http://www.civil.uct.ac.za)
- ❖ Students should contact the Programme Convenors given above with queries about the courses.
- ❖ The Department of Construction Economics and Management offer courses in Project and Construction Management. See the Faculty Handbook for details.
- ❖ In addition to the courses above, CERECAM at UCT offer courses in Computational and Applied Mechanics. See the Faculty Handbook for details.
- ❖ Students may access relevant Stellenbosch University courses for credits towards Postgraduate studies, permission needs to be obtained before attending courses through the Faculty Office.

## General Information

### Applications and Registrations:

Persons wishing to register as postgraduates for the first time must formally apply for admission at least three weeks before their first course begins. International students should ensure that the application and issue of a valid study permit is done well in advance of course commencement-refer <http://uct.ac.za/apply/intlapplicants/chooseuct/why/>. Application forms are available online at [www.uct.ac.za/downloads/uct.ac.za/apply/forms/form1.pdf](http://www.uct.ac.za/downloads/uct.ac.za/apply/forms/form1.pdf) or the Admissions Office, Student Administration Building, Middle Campus.

Tel: (021) 650 2128, Fax: (021) 650 5189/3736 or email: [admissions@uct.ac.za](mailto:admissions@uct.ac.za)

Returning postgraduates must renew their registration in accordance with the instructions that will be sent to them in January 2013.

### Students are asked to note the following:

1. Students may register for the following options:
  - ❖ The Postgraduate Diploma in Engineering (PDE) (minimum 120 credits of coursework).
  - ❖ MSc (Eng) for Engineering graduates by (a) coursework and thesis, in which a minimum of 60 credits must be obtained from courses & 120 credits from a thesis; or (b) a 180 credit thesis. Students must also prepare a scientific paper for publication as part of the degree requirements.
  - ❖ A 120/60 MEng, in which a minimum of 120 credits must be obtained from courses, and 60 credits from a research project. In this case, courses must be selected so as to represent a coherent and consistent field of study in a given area of specialisation, i.e. Structural Engineering and Materials; Transport Studies; Water Quality Engineering or Urban Management and Urban Engineering. Students should approach relevant programme convenors for further advice in this regard. Students will graduate with a MEng in the relevant field. No scientific paper is required.

2. Students are referred to the Faculty Handbook obtainable from The Faculty Office or [www.uct.ac.za/apply/handbooks](http://www.uct.ac.za/apply/handbooks), Tel: (021) 650 2700 or [ebe-faculty@uct.ac.za](mailto:ebe-faculty@uct.ac.za) for further details in regard to the above.

3. The Centre for Transport Studies offers, or facilitates, postgraduate degrees and diplomas. Students may register for an MPhil degree, MEng degree, MSc Eng degree or PG Diploma in Transport Studies.

### Additional Information:

Contact Ms Isabel Ncube, Administrative Assistant,  
Telephone: (021) 650 2580 or Fax: (021) 689 7471

or  
e-mail: [isabel.ncube@uct.ac.za](mailto:isabel.ncube@uct.ac.za)

Fee Enquiries:  
Contact Fees Office Tel: (021) 650 2134





# DEPARTMENT OF CIVIL ENGINEERING

Tel: 021 650 2584  
Fax: 021 689 7471



## Programme in Structural Engineering and Materials

### CIV5108Z: Advanced Mechanics of Materials - Convener: Dr S Skatulla

Physical mechanisms of deformation of common construction materials. Continuum mechanics for elastic material behaviour. Non-linear continuum material behaviour, including visco-elasticity, plasticity, and modelling. Failure and fracture characteristics and modelling of these effects. Introduction to computational mechanics.

### CIV5002Z: Structural Concrete Properties & Practice - Convener: Prof MG Alexander

Constituents of concrete; concrete properties: plastic and hardened properties; concrete mix design; concrete failure and fracture; quality control; special concretes; industrial visits.

### CIV5113S: Structural Dynamics with Applications - Convener: Prof P Moyo

Dynamic equilibrium of structures. Response of a single degree of freedom system to

dynamic excitation: free vibration, harmonic loads, impulse loading and general loading. Response of multi-degree-of-freedom systems. Free vibrations: mass, damping, and stiffness matrices. Rayleigh damping. Forced vibrations: modal superposition and step by step methods. Continuous systems. Applications to seismic design of structures, blast and impact effects on structures and wind engineering.

### CIV5112S: Stability & Design of Steel Structures - Convener: Prof P Moyo

Elastic and inelastic buckling behaviour; plate buckling; non linear instability behaviour of thin-walled structures. Design philosophies in structural steel. Steel connections, design of plate girders. Applications in industrial buildings: crane supporting structures, design for fatigue. Introduction to steel-concrete composition construction: Hybrid steel structures.

## Programme in Geotechnical Engineering

### CIV5111F: Ground Improvement Techniques - Convener: Dr D Kalumba

This course covers important design and construction aspects associated with ground improvement techniques including: Mechanical methods (compaction, explosives, vibroflotation, vibroreplacement); Hydraulic methods (groundwater lowering, preloading, electro-osmosis); Physical/chemical methods (admixtures, grouting, freezing); Inclusions (geosynthetics, reinforcements); Soil remediation.

### CIV5114Z: Foundation Design - Convener: Dr D Kalumba

This course provides knowledge and design skills required to ensure stability of both the ground, and any structure built in or on the ground. It introduces 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: Limit State Design; Analysis and Design of Shallow and Deep Foundations; Foundation Design Standards such as Eurocodes , SANS 10160; etc.

### CIV5110S: Laboratory and Field Techniques - Convener: Dr D Kalumba

Laboratory methods: role and scope of laboratory tests; fundamentals of stress-strain and strength measurements; stresses, pore pressures and strains; practical applications. The theoretical and practical aspects of in situ tests in geotechnical engineering. Emphasis on use of in situ test results for determining engineering properties of soil for design. Field instrumentation; settlement gauges; extensometers; inclinometers; piezometers etc; measurements of in-situ stresses and permeabilities; etc.

## Programme in Transport Studies

### END5035Z: Management of Transport Supply and Demand - Convener: A/Prof R Behrens

Travel behaviour dynamics and behaviour change theories; traffic flow theory; traffic impact assessment and access management; 'transport system management' 'travel demand management'; 'intelligent transport systems'.

### END5036Z: Local Area Transport Planning, Management and Design

Convener: A/Prof R Behrens

Urban design, landscaping and geometric design of streets; the design and management of local area movement networks; traffic calming; accommodation of pedestrians, bicycles and persons with movement disabilities.

### END5038Z: Integrated Land Use-Transport Planning - Convener: A/Prof R Behrens

Transport and land use system relationships; sustainable transport; planning paradigms and rationales; legislative, institutional and financial frameworks; approaches to integrated land use-transport planning; international case studies.

### END5045Z: Intermodal Public Transport Planning and Economics

Convener: Dr W Duff Riddell

Legislative, institutional and financial frameworks; operating characteristics and mode selection; integrated public transport operations and infrastructure, finances; integrated ticketing and fares; service marketing and integrated public information systems.

### END5047Z: Transport Demand Analysis and Project Assessment

Convener: A/Prof M Vanderschuren

Travel data collection and survey design; data processing and analysis; theoretical and philosophical backgrounds of assessment and evaluation methods; techniques for the assessment and evaluation of urban transport proposals.

### END5048Z: Transport Modelling - Convener: A/Prof M Vanderschuren

Theories of travel behaviour and traffic flow; model types; travel demand modelling methods, including, trip generation, trip distribution, mode choice and trip assignment; output analysis.

### END5067Z: Rail Planning and Operations Management - Convener: A/Prof R Del Mistro

Institutional, legislative, financing and planning frameworks; basic rail system concepts, station design, alternative rail technologies and operating characteristics; service planning, scheduling and managing passenger operations; system monitoring; fare structures.

### END5068Z: Bus Planning and Operations Management - Convener: A/Prof R Behrens

Institutional, legislative, financing and planning frameworks; basic bus system concepts and alternatives; service planning, scheduling and managing passenger operations; contracting; the interface between scheduled bus systems and paratransit.

## Programme in Urban Infrastructure, Design and Management

### CIV5064Z: Urban Transitions in the Global South - Convener: Prof E Pieterse

Urbanisation; spatial structuring forces. Problems and issues of developing cities; poverty, exclusion, informality, livelihoods, economic development, governance and infrastructure.

### END5042Z: Sustainable Urban Systems - Convener: Prof H von Blottnitz

The quest for sustainable development is a major contemporary challenge. A fundamental condition for achieving this is restructuring the processes of production-consumption-waste generation within urban/industrial complexes. This transdisciplinary course explores the need for, and ways of, undertaking 'restructuring', including the following: the imperative of Sustainable Development; physical constraints based on energy and mass balances and thermodynamics; General Systems Theory with respect to the interactions between industrial/Urban systems and ecological systems; Environmental/Ecological Economics; the concept of Industrial/Urban metabolism; case studies of Industrial and Urban Ecology in practice; institutional constraints and Decision Making Tools for Industrial/Urban sustainability.

### END5043Z: Community Development - Convener: Dr M Brown-Luthango

Sustainable livelihood, participation, governance, partnerships, development action

plans, survey methods.

### CIV5065Z: Urban Renewal - Convener: Prof E Pieterse

Urban renewal context and policy; informal settlement upgrading; 'township' revitalisation; city centre regeneration; municipal engineering services; community services; housing.

### CIV5107Z: Integrated Urban Water Management

Convener: A/Prof N Armitage

The urban water cycle (e.g. water supply, sewage, drainage) in the context of the "triple bottom line" (economic, environmental, social). The intention of this course is to consider urban water in its entirety from planning to implementation to operation. Technical (engineering) expertise is neither expected nor taught.

### CIV5121Z: Design & Modelling of Water Distribution Systems

Convener: A/Prof JE van Zyl

A structured and practical introduction to the design and modelling of water distribution systems: Components of water transport and distribution systems; Water Demand; Hydraulics of Pipe Flow; Hydraulics of storage and pumps; Hydraulic Design; Engineering design; Pumps and Hydraulic modelling.

## Programme: Civil Infrastructure Management and Maintenance

### CIV5116Z: Durability & Condition Assessment of Concrete Structures

Convener: A/Prof H Beushausen

Durability of concrete structures. Physical, mechanical and chemical deterioration of construction materials such as concrete, fire damage to structures, impact of loads on structures. On-site evaluation techniques, non-destructive testing, diagnostic investigations. Service-life estimation and design.

### CIV5067Z: Advanced Infrastructure Management

Convener: A/Prof R Del Mistro

Overview of Advanced Infrastructure Management (AIM), basic AIM, setting up AIM, AIM techniques, advanced AIM techniques.

### CIV5115Z: Bridge Management & Maintenance - Convener: Prof P Moyo

Bridge management systems. Highway bridges, railway bridges. Maintenance strategies for bridges.

### CIV5120Z: Repair & Rehabilitation of Concrete Structures - Convener: Prof P Moyo

Condition surveys and assessment of deterioration of concrete structures; repair materials and strategies; compatibility aspects; structural requirements and procedures for rehabilitation; durability and repair audits; service life predictions; economics of repair and life-cycle costing; practical and contractual aspects. Strengthening systems; FRP design and application.