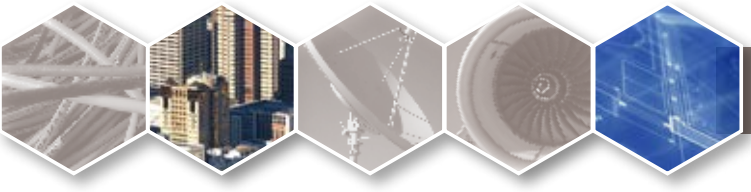

Engineering & the Built Environment

Professor Alison Lewis is the first woman dean and the fifth permanent dean of the Faculty of Engineering and the Built Environment (EBE)

6

DST/NRF SARChI Chairs

Professor **Arnaud Malan** (Department of Mechanical Engineering) appointed to a DST/NRF SARChI Chair in Industrial Computational Fluid Dynamics

Professor **Vanessa Watson** (School of Architecture, Planning and Geomatics) is leading a new ESRC/DFID-funded R2 million project through the African Centre for Cities called 'Consuming Urban Food' in collaboration with partners in Zambia, Zimbabwe and Kenya over the period 2015–2017

Accredited journal units

(Units are assigned to accredited research outputs and translate into a total monetary value)

89

Increase in research contracts

38% in value

25% in number

NRF RATINGS

51 NRF-rated researchers in 2014

1 A rated

17 B rated

21 C rated

12 Y rated

POSTGRADUATE ENROLMENTS AND POSTDOCTORAL FELLOWS

1300
Overall postgraduate student cohort

14 Doctoral graduates

205 Master's graduates of whom 112 were research master's degrees

26 Postdoctoral fellows

Internal **AWARDS**

In Chemical Engineering, the algal team from the Centre for Bioprocess Engineering Research (CeBER) were awarded seed funding through the Technology Innovation Agency for the development of a novel process for the production of the blue pigment, phycocyanin

Professors **Eric van Steen** and **Sue Harrison** (Department of Chemical Engineering) were elected to the UCT College of Fellows

Dr **Sebastian Skatulla** (Department of Civil Engineering) and **Dr Kirsten Corin** (Centre for Mineral Research) were recipients of the Claude Leon Merit Award for Early-Career Researchers

External **AWARDS**

Professor **Genevieve Langdon** (Department of Mechanical Engineering) was the winner of the British Association Medal [Silver] 2014, awarded by the Southern Africa Association for the Advancement of Science (S2A3) to a person under the age of 40 who is actively engaged in research and has, by way of international participation and publications, shown outstanding capability and achievement

Professor **Arnaud Malan** (Department of Mechanical Engineering) was an NSTF (National Science and Technology Forum) award winner in the category for contributions to SET for Research leading to Innovation for the work done in Elemental Software and the establishment of a spin-off company, Elemental Technologies IP Holdings (Pty) Ltd

Dr **Marijke Fagan-Endres** (Department of Chemical Engineering) received the 2014 'Woman in Engineering and the Built Environment Excellence' (WiEBE) award in the category 'Most Promising Young Woman: Research', acknowledging achievements of women in academia

Dr **Rob Huddy** (Centre for Bioprocess Engineering) was awarded the NRF Career Advancement fellowship, a five-year award valued at R2 million for a young researcher to establish himself within the academic environment

Dr **Pieter Levecque** (Department of Chemical Engineering) and Dr **Nico Fischer** (Centre for Catalysis Research) were awarded Newton fellowships for collaborative research with teams in the UK

Dr **Robert Pott**, a chemical engineering postdoctoral fellow in CeBER, won the Johannesburg round of the Institute of Materials, Minerals and Mining (IOM3) Young Persons' Lecture Competition

DOCTORAL GRADUATIONS

Z.H. CHONCO (CHEMICAL ENGINEERING)

Investigation of the promotional effect of Cu and Ag on iron-based Fischer-Tropsch catalysts using ferrites as model catalysts
Supervised by Professor E. van Steen and Professor M. Claeys

C. DE BEER (ELECTRICAL ENGINEERING)

Condition monitoring of polymer electrolyte membrane fuel cells
Supervised by Associate Professor P. Barendse and Professor P. Pillay

R.A. DE SATGÉ (ARCHITECTURE & PLANNING)

Ways of seeing: Conflicting rationalities in contested urban space the N2 Gateway in the context of Langa
Supervised by Professor V. Watson

O. DZOBO (ELECTICAL ENGINEERING)

Risk-based interruption cost index based on customer and interruption parameters
Supervised by Professor T. Gaunt and Dr R. Herman

M. EDIMU (ELECTICAL ENGINEERING)

Using probability density functions to analyze the effect of external threats on the reliability of a South African power grid
Supervised by Professor T. Gaunt and Dr R. Herman

P.P. ERNEST (ELECTRICAL ENGINEERING)

Distributed IP mobility management for hosts and networks
Supervised by Dr O. Falowo and Professor H.A. Chan

O. IPINNIMO (ELECTRICAL ENGINEERING)

Intelligent voltage dip mitigation in power networks with distributed generation
Supervised by Dr S. Chowdhury

R.B. MELAMU (CHEMICAL ENGINEERING)

Waste-based bioenergy – beyond assessments of potential into implementation
Supervised by Associate Professor H. von Blottnitz and Professor F. Petersen

U.J. MINNAAR (ELECTICAL ENGINEERING)

The characterisation and automatic classification of transmission line faults
Supervised by Professor T. Gaunt

R.N. MUIGAI (CIVIL ENGINEERING)

A framework towards the design of more sustainable concrete structures
Supervised by Professor M. Alexander

P.K. OLULOPE (ELECTRICAL ENGINEERING)

Transient stability assessment of hybrid distributed generation using computational intelligence approaches
Supervised by Professor K. Folly

M.B. OTIENO (CIVIL ENGINEERING)

The development of empirical chloride-induced corrosion rate prediction models for cracked and uncracked steel reinforced concrete structures in the marine tidal zone
Supervised by Associate Professor H.D. Beushausen and Professor M. Alexander

L.O. OYEWOBI (CONSTRUCTION, ECONOMICS AND MANAGEMENT)

Modeling performance differentials in large construction organisations in South Africa
Supervised by Dr A. Windapo

J.-P.V. PELTERET (MECHANICAL ENGINEERING)

A computational neuromuscular model of the human upper airway with application to the study of obstructive sleep apnoea
Supervised by Professor D. Reddy

M.J. SAULO (ELECTRICAL ENGINEERING)

Penetration level of un-conventional rural electrification technologies on power networks
Supervised by Professor T. Gaunt

J.J. STEYN (CHEMICAL ENGINEERING)

Developing a framework for the design of the milling and rougher circuits for a platinum-bearing UG2 ore
Supervised by Dr M. Harris

C.A. TONG (ELECTRICAL ENGINEERING)

A scalable real-time processing chain for radar exploiting illuminators of opportunity
Supervised by Professor M.R. Inggs and Dr A. Mishra

J.R. WYNGAARD (ELECTRICAL ENGINEERING)

An FPGA implementation of an investigative many-core processor; Fynbos. In support of a fortran auto-parallelising software pipeline
Supervised by Professor M. Inggs and Mr J. Collins

PATENTS

Filed applications

De Beer, C. Apparatus and method for determining the condition of an electricity-producing cell. Provisional Patent Application Britain 1411419.3.

Boonzaier, J.A., Hendricks, M.R., Vicatos, G. Transport Distraction Apparatus. National Phase Patent Application Egypt 849/2014.

Boonzaier, J.A., Hendricks, M.R., Vicatos, G. Transport Distraction Apparatus. National Phase Patent Application Europe 12806159.5.

Boonzaier, J.A., Hendricks, M.R., Vicatos, G. Transport Distraction Apparatus. National Phase Patent Application India 1321/KOLNP/2014.

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Boonzaier, J.A., Hendricks, M.R., Vicatos, G. Transport Distraction Apparatus. National Phase Patent Application South Africa 2014/03775.

Boonzaier, J.A., Hendricks, M.R., Vicatos, G. Transport Distraction Apparatus. National Phase Patent Application United States 14/360,560.

Claeys, M.C.M., Fischer, N.F. Sample Presentation Device for Radiation-Based Analytical Equipment. National Phase Patent Application Europe 12748545.6.

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Fenner, C.J., Harrison, S.T.L., Meissner, M.P., Olaofe, O.A. Method of Biotransformation of Linear Alkanes. Provisional Patent Application Britain 1411177.7.

Gaunt, C.T., Malengret, M. Optimal Currents for Power Injection or Extraction in a Power Network. PCT Patent Application PCT PCT/IB2014/067017.

Ginsberg, S.I., Parsons, A.T., Vicatos, G. An Endoprosthesis. National Phase Patent Application Europe 12759507.2.

Ginsberg, S.I., Parsons, A.T., Vicatos, G. An Endoprosthesis. National Phase Patent Application South Africa 2014/00342.

Hussain, N., Levecque, P.B.J, Tanaka, S. A Clamp Assembly for a Fuel Cell Stack and a Method of Assembling a Fuel Cell Stack. PCT Patent Application PCT PCT/IB2014/065662.

Hussain, N., Tanaka, S. Fuel Cell MEA with Combined Metal Gas Diffusion Layer and Microporous Layer. Provisional Patent Application Britain 1405659.2.

Inggs, M.R., Mishra, A.K., Wilson-Langman, A. An Integrated Commensal Radar System. PCT Patent Application PCT PCT/IB2014/059036.

Tenim, S., Vicatos, G. Underactuated Prosthetic Hand. Provisional Patent Application Britain 1412034.9.

Vicatos, G. Proximal Femoral Component of a Replacement Hip Alternative Design. Design Patent Application South Africa F2014/01511.

Vicatos, G. Rotating Hinge Knee Prosthesis. National Phase Patent Application Europe 13717979.2.

Vicatos, G. Rotating Hinge Knee Prosthesis. National Phase Patent Application South Africa 2014/06409.

Vicatos, G. Rotating Hinge Knee Prosthesis. National Phase Patent Application United States 14/383,338.

Vicatos, G. Proximal Femoral Component of a Replacement Hip. Design Patent Application South Africa F2014/00625.

Granted Applications

Bradshaw, D.J., Newell, A.J.H. Sulfidisation Process and Apparatus for Enhanced Recovery of Oxidised and Surface Oxidised Base and Precious Metal Minerals. National Phase Patent Application United States 12/514,926.

Claeys, M.C.M., Fischer, N.F. Sample Presentation Device for Radiation-Based Analytical Equipment. National Phase Patent Application South Africa 2013/09585.

Ginsberg, S.I., Parsons, A.T., Vicatos, G. An Endoprosthesis. National Phase Patent Application South Africa 2014/00342.

Golovins, E. A Method for Improving Channel Estimation Performance in Dynamic Spectrum Access Multicarrier Systems. National Phase Patent Application United States 13/514,346.

Lewis, A.E., Nathoo, J. A Method of Saparating Components Out of a Eutectic Solution. National Phase Patent Application Europe 09807969.2.

Lusilao-Zodi, G-A., Morrison, N. A System and Method for Estimating Round-Trip Time in Telecommunication Networks. National Phase Patent Application United States 13/579,253.

SCHOOL OF ARCHITECTURE, PLANNING AND GEOMATICS

(Including the African Centre for Cities)

Director: Associate Professor Alta Steenkamp

School Profile

Within the School of Architecture, Planning and Geomatics, research work includes conventional research and applied research as well as creative work. This takes place within the actively teaching divisions within the School, as well as within dedicated research units. In the Architecture and Planning programmes these research endeavours include areas of enquiry such as urban design, architectural design, architectural education, digital technology, contemporary architectural theory and practice, planning theory, urban conservation, urban transport policy and urban informality.

The ethos of this School is also strongly influenced by our context: the physical context, the city, and the broader social/cultural/economic context of the region and the country. We are committed to engage with these contexts in both a meaningful and critical way, not as abstract sites for investigation but rather as peopled places to which we can respond.

The Geomatics Division within the School undertakes research in a variety of areas. These include documentation, modelling and visualisation of African heritage sites, close-range photogrammetry, laser scanning of architectural structures and remote sensing of the environment; issues relating to land surveying, ownership, registration and tenure; modeling of the shape of the Earth (geoid) using gravity and satellite data, applications of GPS and modeling of datum transformations in Africa; applications of remote sensing and geographic information systems (GIS) to urban, agricultural and environmental monitoring. Spatial data infrastructure (SDI) development for integrated development planning (IDP) in sub-Saharan African cities.

Research Units and Groups

African Centre for Cities

Known colloquially by the acronym 'ACC', the Centre has established an impressive international profile and reputation as a dynamic home for analysis of urban problems and policies. Its interdisciplinary brand gives the ACC huge potential to facilitate urban conversations and inquiry throughout UCT.

'CityLabs', a new model of engaged and applied research, were created to address pressing concerns in Cape Town, including flooding, urban health, densification, ecology, and climate change. New Labs on violence, culture and human settlements have been launched. The ACC partners with international research units studying food security, and women's informal employment. Honours for ACC include its (renewed) status as a UCT 'Signature Theme' and a Rockefeller Innovation Award.

School Statistics

Permanent and Long-term Contract Staff

Professors	5
Associate Professors	6
Senior Lecturers	10
Lecturers	9
Technical Support Staff	8
Administrative Staff	9
Total	**47**

Students

Doctoral	17
Masters	135
Honours	81
Undergraduates	325
Total	**558**

Research Fields and Staff

MR FRANCIS CARTER

Senior Lecturer: Architecture. Curriculum theory in relation to undergraduate built environment design programmes; theories of making, with reference to contemporary South African architecture; programming for new knowledge space.

ASSOCIATE PROFESSOR NICHOLAS COETZER

Architecture. Architectural design; contemporary architectural history and theory; digital technology.

MR ALBERTRUM CROWDER

Lecturer: Architecture. Specialises in the area of cultural heritage conservation. His research focuses on the inherent values that people associate with their environment and the possibility for this to help promote sustainable cultural heritage conservation and development.

MR KEVIN FELLINGHAM

Senior Lecturer: Architecture. Interdisciplinary research, practice and design.

DR MATTEO FRASCHINI

Senior Lecturer: BAS Programme

DR RAMESH GOVIND

Senior Lecturer: Geomatics Programme

MR CLINTON HINDES

Senior lecturer: Landscape Architecture. History and theory of landscape architectural design and its application to teaching and practice. Documenting the history of South African landscape architecture.

MR SIMON HULL

Lecturer: Geomatics. Digital photogrammetry for heritage documentation, fields of land tenure reform, disaster management using remote sensing and GIS, heritage documentation, and improving education.

MR FADLY ISAACS

Lecturer: Architecture. (Measuring) urban settlement quality, integrating strategic urban infrastructure investment.

MS TANIA KATZSCHNER

Lecturer: Planning. Education for sustainable development, sustainable urban systems, creating and nurturing educational systems that serves human needs while also protecting our resources for future generations, trans-disciplinarity and systems thinking.

MS TARNA KLITZNER

Part time Lecturer – MLA Proramme

MS SIMONE LE GRANGE

Lecturer: Architecture. Architectural design, Academic Development Lecturer.

MR MIKE LOUW

Lecturer: Architecture. Sustainable architecture and urbanism, architectural history and materiality.

PROFESSOR IAIN LOW

Architecture. Space and transformation; critical thinking/ practice and the're-writing' of architectural type; post apartheid South African condition: urbanism, the 'new' public realm, contemporary dwelling and architectural pedagogy.

PROFESSOR JO NOERO

Architecture.

DR NANCY ODENDAAL

Senior Lecturer: Planning. Relationship between Information and Communication Technology and urban transformation, metropolitan planning, planning theory and infrastructural transitions in cities of the Global South. Commissioned research on planning and transformation, land use management and planning standards.

MS STELLA PAPANICOLAOU

Lecturer: Design, the tension between meaning and the production of space in architectural practice and education; developing tools for critical thinking to enhance the creative process in architectural education.

PROFESSOR EDGAR PIETERSE

Director: African Centre for Cities, and holder of a DST/ NRF SARChI Research Chair. Promoting new approaches to urban development in South Africa and Africa, in collaboration with partners from the global South.

PROFESSOR GORDON PIRIE

Deputy Director: African Centre for Cities. Geographer, principal research field of transportation and travel.

MR JULIAN RAXWORTHY

Senior Lecturer – MLA Programme

DR TOM SANYA

Senior Lecturer: Architecture. Sustainable Habitat Innovations (SusHI), systems theory in sustainable architecture evaluation with particular focus on Africa. Sustainability evaluation tool (emerging from PhD). Design and making Epistemology – in Search of an Afro-centric perspective via the African Informal Settlement.

MS MELINDA SILVERMAN

Senior Lecturer – MArch Programme

DR GEORGE SITHOLE

Senior Lecturer: Laser altimetry, photogrammetry, 3D object reconstruction.

ASSOCIATE PROFESSOR JULIAN SMIT

Geomatics. Application of remote sensing, photogrammetry and geographic information systems for land and environmental management.

ASSOCIATE PROFESSOR ALTA STEENKAMP

Director: School of Architecture, Planning & Geomatics. History and theory of Southern African architecture and its relation to the global environment.

ADJUNCT ASSOC PROF STEPHEN TOWNSEND

Convenor – M Phil in Conservation of the Built Environment

PROFESSOR VANESSA WATSON

Planning. Planning theory; governance; housing; urbanisation; large city planning.

ASSOCIATE PROFESSOR JENNY WHITTAL

Geomatics. Land tenure and cadastral systems, specialising in land for the urban poor and fiscal cadastral systems and reform.

DR TANJA WINKLER

Senior Lecturer: Planning. Current research interests include critically assessing "the voice of the poor" in urban governance and public decision making processes. Ongoing research on civil society, poverty, and inner city regeneration.

Research Associates

EMERITUS PROFESSOR JULIAN COOKE

Contemporary South African architecture.

EMERITUS PROFESSOR DAVID DEWAR

Former Deputy Dean of the Faculty of Engineering and the Built Environment; BP Chair of Planning; urban structure and form; place making; informal housing; housing policy; informal economic development; public space; regional planning and development.

EMERITUS PROFESSOR LUCIEN LE GRANGE

Urban Conservation Policy; Urban Design; Mission Settlements in South Africa; Documenting modern architecture in Cape Town. Contemporary Architecture – Theory and Practice.

EMERITUS PROFESSOR FABIO TODESCHINI

Architect, city planner, urban designer, heritage practitioner.

EMERITUS PROFESSOR HEINZ RÜTHER

Digital close range and aerial photogrammetry; precise engineering surveying; geographic information systems; visualisation and 3D modeling.

EMERITUS ASSOCIATE PROFESSOR CHARLES MERRY

Earth's gravity field; global positioning system; co-ordinate transformations.

MR BARRIE GASSON

Ecologically sustainable cities; regional planning and development.

Contact Details

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Geomatics: Tel: SA (21) 650-3577 and
Fax: SA (21) 650-3572
Webpage: www.apg.uct.ac.za

RESEARCH OUTPUT

Authored books

Cartwright, A., Taylor, A. and Sutherland, C. 2014. Institutional Pathways for Local Climate Adaptation: A Comparison of Three South African Municipalities. 142pp. Paris: Agence Franaise de Dveloppement (AFD). ISSN 21055386.

Edited books

Duminy, J., Odendaal, N., Watson, V.J., Andreasen, J. and Lerise, F. (eds) 2014. Planning and the Case Study Method in Africa – The Planner in Dirty Shoes. 255pp. England: Palgrave Macmillan. ISBN 9781137307941.

Parnell, S. and Pieterse, E.A. (eds) 2014. In Africa's Urban Revolution: 309pp. London: Zed books. ISBN 9781780325200.

Chapters in books

Berrisford, S. 2014. The challenge of urban planning law reform in African cities. In S. Parnell and E. Pieterse (eds), Africa's Urban Revolution, pp. 167-183. London: Zed Books. ISBN 9781780325200.

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Louw, M. 2014. Style and structure. In K.A. Bakker, N.J. Clarke and, R.C. Fisher (eds), Eclectic ZA Wilhemiens – A shared Dutch built heritage in South Africa, pp. 48-65. South Africa: Visual Books. ISBN 9780626619721.

Low, I. 2014. Architecture in Africa: situated modern and the production of locality. In Elie G. Haddad and David Rifkind (eds), A Critical History of Contemporary Architecture 1960 – 2010, pp. 291-310. England: Ashgate Publishing.ISBN 9781409439813.

Low, I. 2014. South Africa: [enabling space | enabling people]. In C. Ohajunwa and J. Mckenzie (eds), Beyond 'if' to 'how' Disability Inclusion in Higher Education, pp. 63-73. South Africa: Disability Innovations Africa, Disability Studies Programme, DHRS, UCT. ISBN 9780987020338.

Mbaye, J.F. 2014. Hip hop politics: recognising southern complexity. In S. Parnell and S. Oldfield (eds), The Routledge Handbook on Cities of the Global South, pp. 396-412. London and New York: Routledge, Taylor and Francis Group, London and New York. ISBN 9780415818650.

Muller, L. 2014. Rural resistance in South Africa: the Mpondo revolts after fifty years In M. Lange; L. M. Jansen; R. C. Fisher; K. G. Tomaselli; D. Morris (eds), Engraved Landscape: Biesje Poort: Many Voices, pp. 21-46. South Africa: Tormentoso. ISBN 9780620579827.

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Pirie, G.H. 2014. Transport pressures in urban Africa: practices, policies, perspectives. In S. Parnell and E. Pieterse (eds), Africa's Urban Revolution, pp. 133-147. London: Zed Books. ISBN 9781780325200.

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Battersby-Lennard, J.E. and Peyton, S. 2014. The geography of supermarkets in Cape Town: supermarket expansion and food access. Urban Forum, 25: 153-164.

Chimhundu, C., Smit, J.L., Sivarasu, S. and Douglas, T.S. 2014. Interlandmark measurements from lodox statscan images. Journal of Medical Devices-Transactions of the ASME, 8: 030908(3pp). DOI: 10.1115/1.4027102.

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Crush, J. and Tawodzera, G. 2014. Medical xenophobia and Zimbabwean migrant access to public health services in South Africa. Journal of Ethnic and Migration Studies, 40(4): 655-670.

Drivdal, L. and Lawhon, M. 2014. Plural regulation of shebeens (informal drinking places). South African Geographical Journal, 96(1): 97-112.

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Steenkamp, L. and Winkler, T.A. 2014. Linking spatial planning and land use management in the City of Cape Town: the case of the package of plans. Urban Forum, 25(3): 335-353.

Tawodzera, G. 2014. Household food insecurity and survival in Harare: 2008 and beyond. Urban Forum, 25: 207-216.

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Akrofi, E.O. and Whittal, J.F. 2014. A precedent-setting case of allodial ownership of customary land in Ghana. In J. Whittal and S. Motala (eds), AfricaGEO 2014: Proceedings of the Second AfricaGEO Conference, 1-3 July 2014, Cape Town. South Africa: CONSAS. ISBN 9780620606660.

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Siebritz, L.A. and Sithole, G. 2014. Assessing the quality of OpenStreetMap data in South Africa in reference to national mapping standards. In J. Whittal and S. Motala (eds), AfricaGEO 2014: Proceedings of the Second AfricaGEO Conference, 1-3 July 2014, Cape Town. South Africa: CONSAS. ISBN 9780620606660.

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Exhibitions

Pieterse, E.A., Haysom, G., Sitas, F., Tavengwa, T. and Guerero Casas, M. 2014. City desired-an exhibition about cities through the lens of Cape Town. City Hall, 30/10/2014 to 15/12/2014. Commissioned by African Centre for Cities / City of Cape Town.

DEPARTMENT OF CHEMICAL ENGINEERING

(Including the Centre for Bioprocess Engineering Research (CeBER), the Centre for Catalysis Research, the Centre for Minerals Research, the Centre for Research in Engineering Education, the Cystallisation and Precipitation Research Unit, the -DST/NRF Centre of Excellence in Catalysis, c*change and the HySA/catalysis – DST Hydrogen Catalysis Centre of Competence)

Head of Department: Professor Alison E Lewis

Departmental Profile

The vision of the Department of Chemical Engineering is to be "A Beacon in Education and Research", which we aim to fulfil through our combined undergraduate and postgraduate programmes. The undergraduate programme is accredited by the Engineering Council of South Africa, whilst the undergraduate and postgraduate programmes both have national and international recognition for their high quality graduates.

Our postgraduate programme is the largest academic research activity in Chemical Engineering in Africa and is based on a strong link between fundamental research and its application to the solution of industrial and applied problems.

The research programme is focussed around five University-accredited research groupings, including the Centre for Bioprocess Engineering Research (CeBER), the Centre for Catalysis Research, the Centre for Minerals Research, the Centre for Research in Engineering Education and the Crystallisation and Precipitation Research Unit. We also have strong research interests in Environmental Process Engineering and Process Modelling.

The Chemical Engineering Department also hosts the DST-NRF Centre of Excellence in Catalysis, the DST Hydrogen Catalysis Centre of Competence, the South African Minerals to Metals Research Institute (SAMRI), four DST/NRF SARChI chairs: Minerals Beneficiation, Bioprocess Engineering, Nano-Materials for Catalysis and Reaction Engineering, as well as the Anglo American Platinum Chair in Minerals Processing.

Departmental Statistics

Permanent and Long-term Contract Staff

Emeritus Professor	1
Professors	10

Associate Professors	4
Senior Lecturers/Senior Research Officers	14
Lecturers/Research Officers	14
Post Doctoral Fellows	13
Technical and Scientific Staff	40
Administrative Support Staff	22
Total	**118**

Honorary Staff

Honorary Professors	2
Honorary Adjunct Professors	1
Total	**3**

Students

Doctoral	65
Masters	125
BSc(Eng)	515
Total	**705**

Academic staff and research fields

MS NASEEBA ABBAS

Centre for Catalysis Research – Investigation of non-carbon support materials for platinum electrocatalysts in polymer electrolyte fuel cells.

DR LAWRENCE BBOSA

Centre for Minerals Research – Ore breakage, numerical simulation techniques such as the Discrete Element Method (DEM) for simulation of comminution devices; validation through experimental techniques such as Positron Emission Particle Tracking (PEPT).

MR PAUL BEPSWA

Centre for Minerals Research – Metal accounting, comminution.

DR MEGAN BECKER

Process mineralogy – practical study of minerals associated with the processing of ores, concentrates and smelter products for the development and optimisation of metallurgical flow sheets.

MR WALTER BÖHRINGER

Centre for Catalysis Research – Acid catalysis.

DR JENNIFER BROADHURST

Minerals to Metals Signature Theme: Interdisciplinary approaches to the responsible and sustainable development of mineral resources, effective management of mine wastes and primary metal processing residues.

DR ROALD BROSIUS

Centre for Catalysis Research – Diesel selective and gasoline/kerosene selective catalytic synthetic fuel processes; noble metal promoted zeolite catalysts for Fischer-Tropsch compatible hydrocracking catalysts; hierarchically and/or nano-structured zeolite catalysts for combined FT synthesis and fuels upgrading in micro-channel and continuously stirred tank reactors.

PROF JENNI CASE

Higher education with a focus on science and engineering programmes, South African higher education and academic development, student learning in university, contemporary pedagogical and curricular innovation, race, class and gender in higher education, sociology of knowledge, research methods and methodology.

PROF MICHAEL CLAEYS

Centre for Catalysis Research – Director DST/NRF Centre of Excellence in Catalysis (c*change), Fischer – Tropsch synthesis, in-situ catalyst characterisation, nano-materials.

DR OLAF CONRAD

Centre for Catalysis Research – Director HySA/Catalysis.

DR KIRSTEN CORIN

Centre for Minerals Research – Flotation chemistry.

PROF DAVID DEGLON

Centre for Minerals Research – Anglo American Platinum Chair in Minerals Processing. Director of the Centre for Minerals Research. Computational fluid dynamics and flotation cell modelling; conventional mechanical flotation cells and novel flotation cells; particle-bubble contacting in turbulent multi-phase flow environments, with the emphasis on fine particles; use of computational methods for modelling fluid flow and an understanding of non-Newtonian slurry rheology.

PROF MARK DRY

Centre for Catalysis Research – Fischer-Tropsch (FT) catalytic processes, production of synthesis gas.

DR MARIJKE FAGAN-ENDRES

Centre for Bioprocess Engineering Research – Heap bioleaching; bioflotation; biological isothermal micro-calorimetry; MRI and X-ray CT.

DR CARYN FENNER

Centre for Bioprocess Engineering Research – Production of affordable, modern fine chemicals and commodity bioproducts, product optimisation, and induction; production of industrial enzymes with commercial applications; environmental sustainability of biocatalytic processes, cascade reactions with respects to green chemistry and the development and optimisation of bio-analytical techniques.

PROF JACK FLETCHER

Director of the Centre for Catalysis Research – Contract Director National Hydrogen Catalysis Competence Centre (HySA/Catalysis) – catalysis by noble metals, zeolite catalysed conversion of phenol and derivatives, wax hydrocracking, shape selectivity in zeolites and molecular sieves, hydrogen processors, and fuel cells.

PROF JEAN-PAUL FRANZIDIS

SA Research Chair in Minerals Beneficiation, Director of Minerals to Metals Signature Theme – Integrating and expanding capacity in minerals beneficiation research.

DR INDRESAN GOVENDER

Centre for Minerals Research – Comminution, DEM modelling, PEPT.

MR MARTIN HARRIS

Centre for Minerals Research – Flotation circuit modelling.

PROF SUE HARRISON

SA Research Chair in Bioprocess Engineering, Director of the Centre for Bioprocess Engineering Research – Interaction of micro-organisms with the environment; microbial ecology and community dynamics in planktonic and sessile environments; energy efficient reactor systems; biokinetics, metabolic modelling of biomass and bioproducts; and integrated bioprocess systems. The above is applied to the fields of: alkane biotechnology, biomanufacture of pigments, enzymes and nutraceuticals, yeast handling, mineral bioleaching through heap and tank processes, Acid Mock Drainage (AMD) prevention, AMD remediation through sulphate reduction, wastewater bioprocessing, algal bioprocesses for bioenergy and fine chemicals, bioprocess design, and evaluation for sustainable process engineering.

MR HILTON HEYDENRYCH

Crystallisation & Precipitation Research Unit – Development of a systematic approach for the treatment of effluent water streams using multi-criteria evaluations and comparisons of simulated processes to develop new heuristic principles for the design of water treatment processes. Chemical engineering education–curriculum design and the analysis of throughput issues.

DR ROBERT HUDDY

Centre for Bioprocess Engineering Research – Microbiology, molecular biology, metagenomics, biological isothermal micro-calorimetry; mineral biotechnology; microbial ecology, biological sulphate reduction, bioremediation of thiocyanate contaminated wastewater effluent

MR NABEEL HUSSAIN

Centre for Catalysis Research – Design and development of catalytic components and devices for low temperature fuel cells.

DR ADENIYI ISAFIADE

Environmental and Process Systems Engineering – Process design and optimisation.

DR MADELYN JOHNSTONE-ROBERTSON

Centre for Bioprocess Engineering Research – Enzyme production, wastewater biorefineries, biopolymer production, integrated bioprocess development, fungal pigments, bioreactor technology.

DR PIETER LEVECQUE

Centre for Catalysis Research – Electrocatalysts for fuel cells and high throughput catalyst preparation.

PROF ALISON LEWIS

Director of the Crystallisation & Precipitation Research Unit – Industrial precipitation and crystallisation, product and particle analysis; process control for optimised product quality; crystallisation process development; aqueous chemistry modelling of speciation, thermodynamic equilibria, hydrodynamic and population balance modelling of precipitation systems; water treatment through crystallisation, eutectic freeze crystallisation.

MR NIELS LÜCHTERS

Centre for Catalysis Research – High throughput experimentation, parallel preparation of heterogeneous catalysts, high throughput methodology for fuel processing research.

A/PROF AUBREY MAINZA

Centre for Minerals Research – Comminution, classification, CFD/DEM modelling, PEPT.

DR BELINDA MCFADZEAN

Centre for Minerals Research – Flotation chemistry.

DR ANDREW MACBRIDE

Centre for Minerals Research – Comminution, CFD/DEM modelling.

PROF KLAUS MÖLLER

Process Modelling and Optimisation – Multiphase reactor modelling, separator modelling, integrated reaction – separation systems modelling, parameter estimation, modular process and flowsheet feasibility and optimisation. Centre for Catalysis Research – wax hydrocracking modelling, FT process modelling.

PROF CYRIL O'CONNOR

Centre for Minerals Research – Flotation chemistry.

A/PROF JOCHEN PETERSEN

Centre for Bioprocess Engineering Research – Hydrometallurgy, especially heap (bio) leaching of low-grade minerals, heap reactor characterisation and modelling, bioleaching processes.

MS TOKOLOHO RAMPAI

Centre for Minerals Research – Carbide MAX phases composites with cubic boron nitride ceramics, pyrometallurgy.

DR MARCOS RODRIGUEZ-PASCUAL

Crystallisation and Precipitation Research Unit – Design and implementation of reactors for crystallisation and precipitation processes applying thermo-fluid dynamics and non-intrusive optical techniques.

MS JEANETTE SWEET

Centre for Minerals Research; comminution circuit optimisation and design, flotation circuit optimisation, technology transfer.

DR SIEW TAI

Centre for Bioprocess Engineering Research – High-value bioproducts, vaccines and biopharmaceuticals; bioreactor design, cell culture in bioreactors; beer and wine fermentation; metabolic engineering, systems biology.

PROF ERIC VAN STEEN

Centre for Catalysis Research/DST-NRF Centre of Excellence in Catalysis c*change – Fischer-Tropsch synthesis, nano-materials, molecular modelling of heterogeneous catalytic systems, reaction kinetics.

MR ANDRE VAN DER WESTHUIZEN

Centre for Minerals Research – Comminution and fine particle processing.

DR ROB VAN HILLE

Centre for Bioprocess Engineering Research – Mineral biotechnology, algal biotechnology, microbial ecology, carbon cycling, sulphide chemistry and bioremediation, acid mine drainage retention treatment, anaerobic digestion, bioenergy.

PROF HARRO VON BLOTTNITZ

Environmental and Process Systems Engineering – Industrial ecology, life cycle assessment, material flow analysis, recycling systems, organic waste valorisation with a focus on biogas, all applied to questions of resource-efficient and clean production, also in informal settings. Engineering education for sustainable development. Sustainable mineral resource development.

MS JENNIFER WIESE

Centre for Minerals Research – Flotation Chemistry.

Honorary staff and associates

HONORARY PROF DEE BRADSHAW

Centre for Minerals Research – Flotation Chemistry. Honorary Prof Jim Petrie Environmental and Process Systems Engineering – Decision support systems, sustainable energy systems, industrial ecology.

HONORARY ADJUNCT PROF DAVID WRIGHT

Chemical Engineering, strategy, internal and external review, curriculum, design.

Postdoctoral fellows

DR MARC FÜRST

Detailed analysis of iron-based Fischer-Tropsch product using GCxGC chromatography.

DR MELINDA GRIFFITHS

Centre for Bioprocess Engineering Research – Process improvements and economics of large-scale production of Spirulina and other micro-algae.

DR ROB HUDDY (UNTIL 30 JUNE)

Centre for Bioprocess Engineering Research- Investigating the behaviour and ecology of mixed microbial communities in dynamic bioprocess environments.

DR THANOS KOTSIOPOULOS

Centre for Bioprocess Engineering Research – Liquid-mineral contacting for the optimisation of heap leaching and prevention of acid rock drainage.

DR HENNIE KOTZE

Magnetic and Raman analysis of working Fischer-Tropsch catalysts.

DR TOBI LOUW

Centre for Bioprocess Engineering Research – Multi-scale mathematical modelling of algae raceway ponds for optimal mass transfer and energy usage.

DR ROBERT HENKEL

Centre for Catalysis Research – Two-dimensional gas chromatography GCxGC-TOF, magnometer.

DR PETER MALATJI

Centre for Catalysis Research – Development of bimetallic precious metal catalysts for steam reforming of methane.

DR VALENTINA RUSSO

Environmental and Process Systems Engineering – LCA for the quantification of environmental impact reductions provided by biogas installations incorporated in the meat production value chain.

DR ROB POTT

Centre for Bioprocess Engineering Research – The conversion of waste organics into hydrogen, electricity and high value products by wild-type and genetically modified Rhodopseudomonas palustris.

DR BERNHARD SCHWANITZ

Centre for Catalysis Research – Development of bimetallic precious metal catalysts for steam reforming of methane and Advanced MEA fabrication methods.

DR MARIETTE SMART

Centre for Bioprocess Engineering Research – Selection and characterisation of CO2 sequestering algal strains for carbon mitigation of coal-derived flue gas and waste water remediation at power production plants.

DR ZENGHUO SONG

Centre for Minerals Research – Investigation of the flotation behaviour of mill products using different grinding media.

Contact Details

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University of Cape Town,
Private Bag X3,
Rondebosch, 7701
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RESEARCH OUTPUT

Chapters in books

Case, J.M. 2014. Problematising curriculum contemporary debates in engineering education. In M. Young and J. Muller (eds), Knowledge, Expertise and the Professions, pp. 143-156. New York: Routledge Journals, Taylor & Francis Ltd, New York. ISBN 9780415713917.

Articles in peer-reviewed journals

Alvarez-Silva, M., Wiese, J.G. and O'Connor, C.T. 2014. An investigation into the role of froth height and depressant dosage in the recovery of chromite in the flotation of UG2 ore using a laboratory column. Minerals Engineering, 55: 125-131.

Alwi, S.R.W., Lee, C.K.M., Lee, K.Y., Abd Manan, Z. and Fraser, D. 2014. Targeting the maximum heat recovery for systems with heat losses and heat gains. Energy Conversion and Management, 87: 1098-1106.

Appa, H., Deglon, D.A. and Meyer, C.J. 2014. Numerical modelling of mass transfer in an autoclave. Hydrometallurgy, 147-148: 234-240.

Becker, M.E., Wiese, J.G. and Ramonotsi, M. 2014. Investigation into the mineralogy and flotation performance of oxidised PGM ore. Minerals Engineering, 65: 24-32.

Brosius, R. and Fletcher, J.C.Q. 2014. Hydrocracking under Fischer-Tropsch conditions; the effect of CO on the mass transfer resistance by metal clusters. Journal of Catalysis, 317: 318-325.

Chivavava, J., Rodriguez-Pascual, M. and Lewis, A.E. 2014. Effect of operating conditions on ice characteristics in continuous eutectic freeze crystallisation. Chemical Engineering & Technology, 37(8): 1314-1320.

Claeys, M.C., Dry, M.E., Van Steen, E.W.J., Du Plessis, E., Van Berge, P., Saib, A.M. and Moodley, D.J. 2014. In situ magnetometer study on the formation and stability of cobalt carbide in Fischer-Tropsch synthesis. Journal of Catalysis, 318: 193-202.

Corin, K.C. and O'Connor, C.T. 2014. A proposal to use excess Gibbs energy rather than HLB number as an indicator of the hydrophilic-liphophilic behaviour of surfactants. Minerals Engineering, 58: 17-21.

Corin, K.C. and Wiese, J.G. 2014. Investigating froth stability: a comparative study of ionic strength and frother dosage. Minerals Engineering, 66-68: 130-134.

Dalvie, M.A., Africa, A. and Naidoo, S. 2014. Relationship between firewood usage and urinary Cr, Cu and as in informal areas of Cape Town. SAMJ South African Medical Journal, 104(1): 61-64.

de Beer, M., Kunene, A., Nabaho, D., Claeys, M.C. and Van Steen, E.W.J. 2014. Technical and economic aspects of promotion of cobalt-based Fischer-Tropsch catalysts by noble metals – a review. Journal of the Southern African Institute of Mining and Metallurgy, 114: 157-165.

Dey, S., Pani, S. and Singh, R. 2014. Study of interactions of frother blends and its effect on coal flotation. Powder Technology, 260: 78-83.

Egan, T.J., Rodriguez-Pascual, M. and Lewis, A.E. 2014. In situ growth measurements of sodium sulfate during cooling crystallisation. Chemical Engineering & Technology, 37(8): 1283-1290.

Fabbri, E., Mohamed, R., Levecque, P., Conrad, O., Kotz, R. and Schmidt, T.J. 2014. $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$ perovskite activity towards the oxygen reduction reaction in alkaline media. ChemElectroChem, 1: 338-342.

Fabbri, E., Mohamed, R., Levecque, P., Conrad, O., Kotz, R. and Schmidt, T.J. 2014. Composite electrode boosts the activity of $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$ perovskite and carbon toward oxygen reduction in alkaline media. ACS Catalysis, 4: 1061-1070.

Fabbri, E., Taylor, S., Rabis, A., Levecque, P., Conrad, O., Kotz, R. and Schmidt, T.J. 2014. The effect of platinum nanoparticle distribution on oxygen electroreduction activity and selectivity. ChemCatChem, 6(5): 1410-1418.

Fagan-Endres, M.A., Ngoma, I.E., Chiume, R., Minnaar, S.H., Sederman, A.J., Johns, M.L. and Harrison, S.T.L. 2014. MRI and gravimetric studies of hydrology in drip irrigated heaps and its effect on the propagation of bioleaching micro-organisms. Hydrometallurgy, 150: 210-221.

Fischer, N., Clapham, B., Feltes, T.E., Van Steen, E.W.J. and Claeys, M.C. 2014. Size-dependent phase transformation of catalytically active nanoparticles captured in situ. Angewandte Chemie-International Edition, 53: 1342-1345.

Fischer, N., Van Steen, E.W.J. and Claeys, M.C. 2014. Tri-cobalt carboxylate as a catalyst and catalyst precursor in the Fischer-Tropsch synthesis. ChemCatChem, 6: 1707-1713.

Forsman, J., Linder, C., Moll, R., Fraser, D. and Andersson, S. 2014. A new approach to modelling student retention through an application of complexity thinking. Studies in Higher Education, 39(1): 68-86.

Gebreegziabher, Z., Naik, L., Melamu, R.B. and Balana, B.B. 2014. Prospects and challenges for urban application of biogas installations in Sub-Saharan Africa. Biomass & Bioenergy, 70: 130-140.

Govender, E., Kotsiopoulos, A., Bryan, C.G. and Harrison, S.T.L. 2014. Modelling microbial transport in simulated low-grade heap bioleaching systems: the biomass transport model. Hydrometallurgy, 150: 299-307.

Griffiths, M., van Hille, R.P. and Harrison, S.T.L. 2014. The effect of degree and timing of nitrogen limitation on lipid productivity in Chlorella vulgaris. Applied Microbiology and Biotechnology, 98: 6147-6159.

Griffiths, M., van Hille, R.P. and Harrison, S.T.L. 2014. The effect of nitrogen limitation on lipid productivity and cell composition in Chlorella vulgaris. Applied Microbiology and Biotechnology, 98: 2345-2356.

Jones, S. and Harrison, S.T.L. 2014. Aeration energy requirements for lipid production by Scenedesmus sp. in airlift bioreactors. Algal Research-Biomass Biofuels and Bioproducts, 5: 249-257.

Kapembwa, M., Rodriguez-Pascual, M. and Lewis, A.E. 2014. Heat and mass transfer effects on ice growth mechanisms in pure water and aqueous solutions. Crystal Growth & Design, 14(1): 389-395.

Kotta, L., Case, J.M. and Luckett, K.M. 2014. Contradictions in the situational logic of the university: implications for student success. South African Journal of Education, 28(2): 514-532.

Li, T., Li, X., Zhao, Q., Shi, Y. and Teng, W. 2014. Fabrication of n-type $CuInS_2$ modified TiO_2 nanotube arrays heterostructure photoelectrode with enhanced photoelectrocatalytic properties. Applied Catalysis B-Environmental, 156-157: 362-370.

McFadzean, B.J. and O'Connor, C.T. 2014. A thermochemical study of thiol collector surface reactions on galena. Minerals Engineering, 65: 54-60.

Meissner, M.P., Xu, Z., Jones, G., Minnaar, S.H. and Harrison, S.T.L. 2014. A novel microwell-based analytical technique for studying ferrous iron biooxidation activity. Minerals Engineering, 60: 8-13.

Meyer, N.A., Vogeli, J., Becker, M.E., Broadhurst, J.L., Reid, D.L. and Franzidis, J.-P. 2014. Mineral carbonation of PGM mine tailings for CO_2 storage in South Africa: a case study. Minerals Engineering, 59: 45-51.

Mogorosi, R., Claeys, M.C. and Van Steen, E.W.J. 2014. Enhanced activity via surface modification of fe-based Fischer-Tropsch catalyst precursor with titanium butoxide. Topics in Catalysis, 57: 572-581.

Mwase, J., Petersen, J. and Eksteen, J. 2014. A novel sequential heap leach process for treating crushed Platreef ore. Hydrometallurgy, 141: 97-104.

Mwirigi, J., Balana, B.B., Mugisha, J., Walekhwa, P., Melamu, R., Nakami, S. and Makenzi, P. 2014. Socio-economic hurdles to widespread adoption of small-scale biogas digesters in Sub-Saharan Africa: a review. Biomass & Bioenergy, 70: 17-25.

Naik, L., Gebreegziabher, Z., Tumesige, V., Balana, B.B., Mwirigi, J. and Austin, G. 2014. Factors determining the stability and productivity of small scale anaerobic digesters. Biomass & Bioenergy, 70: 51-57.

Narasimha, M., Mainza, A.N., Holtham, P., Powell, M.S. and Brennan, M. 2014. A semi-mechanistic model of hydrocyclones – developed from industrial data and inputs from CFD. International Journal of Mineral Processing, 133: 1-12.

Nasterlack, H., Von Blottnitz, H. and Wynberg, R.P. 2014. Are biofuel concerns globally relevant? Prospects for a proposed pioneer bioethanol project in South Africa. Energy for Sustainable Development, 23: 1-14.

Ndlovu, B., Forbes, E., Farrokhpay, F., Becker, M.E., Bradshaw, D.J. and Deglon, D.A. 2014. A preliminary rheological classification of phyllosilicate group minerals. Minerals Engineering, 55: 190-200.

Nduna, M., Lewis, A.E. and Nortier, P. 2014. A model for the zeta potential of copper sulphide. Colloids and Surfaces A-Physicochemical and Engineering Aspects, 441: 643-652.

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DEPARTMENT OF CIVIL ENGINEERING

Head of Department: Associate Professor Neil Armitage

Departmental Profile

The Department of Civil Engineering currently has an establishment of 18 permanent full-time academic positions and 2 research officers, supported by a dedicated complement of 18 technical and administrative staff. It offers a four-year BSc (Civil Engineering) degree programme and several taught postgraduate programmes, as well as supervised research studies leading to Master's and Doctoral degrees. The current enrolment is about 418 undergraduate students and 262 postgraduates – giving a total of 680 students.

Postgraduate teaching and research is conducted within the framework of well-established research groups in the areas of Structural Engineering and Mechanics, Geotechnical Engineering, Concrete Materials and Technology, Hydraulic Engineering, Water Quality Engineering, Urban Water Management, Urban Engineering and Management, Transport Studies and GIS. Members of staff also interact with research groups in other departments, such as the Centre for Research in Computational and Applied Mechanics (CereCAM) and the African Centre for Cities (ACC). The Department has fruitful collaborative links with several local and overseas universities, and with local industry. Much of the work done by members of staff finds application in industry.

The high quality of the research undertaken by the Department is evidenced by the considerable number of peer-reviewed publications in ISI-accredited international journals produced by members of staff annually, and the international recognition that members of staff enjoy in their areas of research. Members actively participate on the committees of local professional bodies, provide expert advice to industry, and serve on the editorial and advisory boards of various international journals and conferences.

Departmental Statistics

Permanent and Long-Term Contract Staff

Professors	6
Associate Professors	7
Senior lecturers	5
Lecturers	1
Research officers	2
Technical Support Staff	9
Administrative Support Staff	10
Total	**40**

Emeritus and Honorary Staff

Emeritus Associate Professors	5
Honorary Research Associates	5
Total	**10**

Students

Doctoral	29
Masters and Diplomas	233
Undergraduate	418
Total	**680**

Research Fields and Staff

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RESEARCH OUTPUT

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Piller, O. and Van Zyl, J.E. 2014. Incorporating the FAVAD leakage equation into water distribution system analysis. In O. Giustolisi et al (eds), Proceedings of 16th International Conference on Water Distribution System Analysis (WDSA 2014): Procedia Engineering 89 (2014), 14-17 July 2014, Bari, Italy. Netherlands: Elsevier. ISBN 18777058.

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Tamuka-Moyo, H.T. and Del Mistro, R.F. 2014. An investigation of the perceived consequences to employees of reducing employment related trip end choices in Cape Town. In W. Steyn (ed), Proceedings of the 33rd Southern African Transport Conference (SATC 2014), 7-10 July 2014, Pretoria, South Africa. Pretoria, South Africa: CE Projects cc. ISBN 9781920017613.

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Vanderschuren, M.J.W.A. and McKune, D. 2014. Death or alive: can road accident victims in the Western Cape get access to trauma care? In W. Steyn (ed), Proceedings of the 33rd Southern African Transport Conference (SATC 2014), 7-10 July 2014, Pretoria, South Africa, Pretoria, South Africa: CE Projects cc. ISBN 9781920017613.

DEPARTMENT OF CONSTRUCTION ECONOMICS AND MANAGEMENT

Head of Department:
Professor Keith Cattell

Departmental Profile

Research and allied scholarly work in the Department falls under two broad themes of property and construction. Five research groups examine issues related to infrastructure delivery, construction industry development, wellness in construction, emerging property markets, and facilities management. A number of cross cutting themes provide diversity and smaller research interest groups; these themes include sustainability, project management, human development, property markets and property valuations, procurement, entrepreneurship, urban management and teaching and learning.

Strong research links exist with academic institutions in the United Kingdom, Australia, Italy, United States of America, Nigeria, Central and East Africa, as well as with institutions within South Africa.

During 2014, papers were presented at key international conferences in Reading (United Kingdom), Milan (Italy), Atlanta (United States of America), Lagos (Nigeria), Livingstone (Zambia), Pretoria, Port Elizabeth and Johannesburg. In addition, a number of papers were published in peer-reviewed local and international journals, frequently with international co-authorship, underlining the Department's international profile and collaborative research philosophy.

Nationally, the Department continues its engagement with local and international organisations. These include:

- The Association of South African Quantity Surveyors on the Standard System and Chapter Committees,
- The South African Council for the Project and Construction Management Profession on the CMDC Research Committee,
- The South African Council for the Quantity Surveying Profession as President and serve on the Education Standards and Research Sub-Committee,
- The Council for the Built Environment (Council Member),
- The Royal Institution of Chartered Surveyors on the South African Regional Board,
- The South African Facilities Management Association,
- The South African Property Owners Association,
- The Construction Industry Development Board,
- The African Real Estate Society, and
- The South African National Research Foundation (NRF).

Research endeavours by individual staff have been good in terms of higher degree graduates, attracting research funding, and research outputs. The staff received research funding from a variety of sources in 2014, namely: the University Research Committee (URC), the National Research Foundation (NRF), and the Construction Industry Development Board (CIDB). In addition, the department boasts a "B2" NRF-rated researcher.

Departmental Statistics

Permanent and Long-term Contract Staff

Professors	2
Associate Professors	2
Senior Lecturers	9
Lecturer	3
Administrative and Clerical Staff	5
Departmental Assistant	1
Total	**22**

Students

Doctoral	7
Masters	100
Postgraduate Diploma	25
Honours	86
Undergraduate	328
Total	**546**

Research Fields and Staff

Permanent Staff

PROFESSOR KS CATTELL

Head of Department: Value management; workplace facilities management; learning spaces; the impact of HIV/AIDS on the South African construction industry; corruption in the construction industry; and stress management for built environment professionals.

PROFESSOR PA BOWEN

The impact of HIV/AIDS on the South African construction industry; and work-life balance and stress management for built environment professionals.

ASSOCIATE PROFESSOR KA MICHELL

Facilities management as a social and community enterprise in low-income areas of cities; urban facilities management; urban management and sustainability; work space planning and management in buildings; learning spaces.

ASSOCIATE PROFESSOR F VIRULY

Urban economics; property development; property feasibility studies; property and building cycles; property and the macro economy; econometric forecasting of the commercial and residential property markets; institutions and the structure of property markets.

MRS E EDWARDES

Senior Lecturer: Education in construction studies; enhancement of skills required for construction studies.

MRS K EVANS

Senior Lecturer: Work with the African Centre for Cities Research Laboratory; innovative financing of medium to low-income housing from the perspective of end-users; working capital, bridging finance and wholesale finance.

MR I JAY

Senior Lecturer: Project Management – particularly in the area of project strategy and project portfolio (Programme) management. Application of value models to portfolio balancing, and enterprise wide project management structures and systems. Value Management – particular focus on client values, determination of project measures of success (success criteria) and modelling of client values.

MRS K LE JEUNE

Senior Lecturer: Gender related issues within the Built Environment professions; green buildings; service learning and application in construction education; social responsibility and construction education.

MR M MASSYN

Senior Lecturer: Skills and competencies of SME's within the construction industry; procurement systems used in housing delivery with particular emphasis on the PHP delivery system.

MR R MCGAFFIN

Senior Lecturer: The relationship between land economics and planning; property markets and value-capture; housing and affordable housing markets.

DR M MOOYA

Senior Lecturer: Informal/Low income property markets; property market processes; property valuation theory and practice; epistemology and methodology in property market research.

DR N TUAN

Senior Lecturer: Systems theory in project management; multi-criteria decision making managing complexity in engineering systems and organisations.

DR A WINDAPO

Senior Lecturer: Contractor performance and development studies; housing procurement and development studies; risk and quality management processes on construction projects; and health, safety and environmental issues.

MR S NURICK

Lecturer: Green building and its link to corporate real estate, with specific focus on facilities management, property finance and valuation. Stakeholder engagement/perceptions of green building features and initiatives.

MR U ORDOR

Lecturer: Strategic urban management systems; investigating urban management systems in African emerging economies. Sustainable urban development as a vehicle for economic growth and development in emerging African economies.

MS A STREET

Lecturer: Social learning spaces, Designing curricula and learning spaces for better retention of knowledge.

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RESEARCH OUTPUT

Chapters in books

du Plessis, Y. and Jay, C.I. 2014. Paradox and complexity in 21st century project management. In Y. du Plessis (ed), Project Management A Behavioural Perspective: Principles, Practices and Cases, pp. 31-60. Cape Town: Pearson holdings Southern Africa (Pty) Ltd. ISBN 9781775784951.

Articles in peer-reviewed journals

Bowen, P.A., Allen, Y.L., Edwards, P., Cattell, K.S. and Simbayi, L.C. 2014. Guidelines for effective workplace HIV/AIDS intervention management by construction firms. Construction Management and Economics, 32(4): 362-381.

Bowen, P.A., Edwards, P., Lingard, H. and Cattell, K.S. 2014. Occupational stress and job demand, control and support factors among construction project consultants. International Journal of Project Management, 32: 1273-1284.

Bowen, P.A., Edwards, P., Lingard, H. and Cattell, K.S. 2014. Predictive modeling of workplace stress among construction professionals. Journal of Construction Engineering and Management-Asce, 140(3): 4013055(10pp). DOI: 10.1061/(ASCE)CO.1943-7862.0000806.

Bowen, P.A., Edwards, P., Lingard, H. and Cattell, K.S. 2014. Workplace stress, stress effects, and coping mechanisms in the construction industry. Journal of Construction Engineering and Management-Asce, 140(3): 4013059(15pp). DOI: 10.1061/(ASCE)CO.1943-7862.0000807.

Bowen, P.A., Govender, R.A. and Edwards, P. 2014. Structural equation modeling of occupational stress in the construction industry. Journal of Construction Engineering and Management-Asce, 140(9): 04014042(14pp). DOI: 10.1061/(ASCE)CO.1943-7862.0000877.

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McGaffin, R.P., Napier, M. and Gavera, L. 2014. Value capture in South Africa-conditions for their successful use in the current legal context. Urban Forum, 25: 375-387.

Windapo, A.O. 2014. Examination of green building drivers in the South African construction industry: economics versus ecology. Sustainability, 6: 6088-6106.

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Windapo, A.O., Oyewobi, L. and Zwane, Z. 2014. Investigation of stakeholders' awareness and adoption of inherently safer design (ISD) principles in South African utility industry projects. Journal of Loss Prevention in the Process Industries, 32: 152-160.

Peer-reviewed published conference proceedings

Bowen, P.A., Govender, R.A., Edwards, P. and Cattell, K.S. 2014. Workplace stress in the construction industry: an explanatory model. In A. Raiden and E. Aboagye-Nimo (eds), Proceedings of the 30th Annual Association of Researchers in Construction Management (ARCOM) Conference, 1-3 September 2014, Portsmouth, c/o School of Construction Management and Engineering, University of Reading, Reading. UK: ARCOM. ISBN 9780955239083.

Evans, K.M., Ma, C., De Campos, D.R., Hepburn-Brown, J. and Edwardes, E. 2014. Informal trading and township shopping centres in South Africa. In A.A. Talukhaba (ed), Conference Proceedings of the 7th Annual Quantity Surveying Research Conference on "Mapping the Future" (SACQSP 2014), 22-23 September 2014, CSIR International Convention Centre, Pretoria, Tshwane University of Technology, Pretoria. Pretoria: Department of Building Sciences, Faculty of Engineering and the Built Environment, Tshwane University of Technology. ISBN 9780620613972.

Jay, C.I., Tuan, N. and Massyn, M.W. 2014. Applying the lens of complexity theory to project management. In J. Tamosaitiene, K. Panuwatwanich, N. Mishima and C. Ko (eds), Proceedings of The 2014 (5th) International Conference on Engineering, Project, and Production Management (EPPM 2014), 26-28 November 2014, Port Elizabeth, South Africa, Port Elizabeth: Department of Construction Management, Nelson Mandela Metropolitan University. ISBN 9781920508319.

Odediran, S. and Windapo, A.O. 2014. Constraints to total cost management (TCM) of construction projects in Nigeria. In AICE – Italian Association for Total Cost Management (eds), Proceedings of ICEC 2014 – IX World Congress. Re-Engineering Total Cost Management, 20-22 October 2014, Milan (Italy). Milan: FAST-Federation of Scientific and Technical Associations. ISBN 9788894014105.

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Oyewobi, L., Windapo, A.O. and Cattell, K.S. 2014. Competitive strategy, decision-making style and organisational performance: a contingency approach. In S. Laryea and E.O. Ibem (eds), Proceedings of the 8th Construction Industry Development Board (CIDB)

Postgraduate Conference, 10-11 February 2014, University of Witwatersrand, Johannesburg, University of the Witwatersrand. Johannesburg: School of Construction Economics and Management, University of the Witwatersrand. ISBN 9780956606082.

Oyewobi, L., Windapo, A.O. and Cattell, K.S. 2014. Competitiveness of construction organisations in South Africa. In D. Castro-Lacouture, J. Irizarry and B. Ashuri (eds), Proceedings of the 2014 Construction Research Congress (CRC2014): Construction in a Global Network, 19-21 May 2014, Atlanta, Georgia, USA, School of Building Construction, Georgia Institute of Technology: American Society of Civil Engineers (ASCE). ISBN 9780784413517.

Oyewobi, L., Windapo, A.O. and Rotimi, J. 2014. Evaluation of the impact of organisational contingency factors on firm performance. In I. Musonda and C. Aigbavboa (eds), Proceedings of the International Conference on Infrastructure Development and Investment Strategies for Africa (DII-2014), 25-26 September 2014, Livingstone, Zambia. Doornfontein, Johannesburg, SA: Department of Construction Management and Quantity Surveying, University of Johannesburg. ISBN 9780869707821.

Tuan, N., Jay, C.I. and Massyn, M.W. 2014. Modelling the factors impacting the sustainability of South Africa's construction industry – an interpretive structural modelling approach. In J. Tamosaitiene, K. Panuwatwanich, N. Mishima and C. Ko (eds), Proceedings of The 2014 (5th) International Conference on Engineering, Project, and Production Management (EPPM 2014), 26-28 November 2014, Port Elizabeth, South Africa. Port Elizabeth: Department of Construction Management, Nelson Mandela Metropolitan University. ISBN 9781920508319.

Windapo, A.O. and Cattell, K.S. 2014. Evaluation of location factors influencing building material price variation in South Africa. In AICE – Italian Association for Total Cost Management (eds), Proceedings of ICEC 2014 – IX World Congress. Re-Engineering Total Cost Management, 20-22 October 2014, Milan (Italy). Milan: FAST-Federation of Scientific and Technical Associations. ISBN 9788894014105.

Windapo, A.O. and Odediran, S. 2014. Factors influencing skilled labour supply in the South African construction industry. In F. Emuze (eds), Conference Proceedings – 3rd Construction Management Conference, 30 November – 2 December 2014, Port Elizabeth. Port Elizabeth: Department of Construction Management, Nelson Mandela Metropolitan University. ISBN 9781920176990.

Windapo, A.O., Odediran, S., Oyewobi, L. and Cattell, K.S. 2014. Political risk factors influencing export of construction services into African markets: a preliminary survey. In F. Emuze (ed), Conference Proceedings – 3rd Construction Management Conference, 30 November – 2 December 2014, Port Elizabeth. Port Elizabeth: Department of Construction Management, Nelson Mandela Metropolitan University. ISBN 9781920176990.

Windapo, A.O., Qamata, G. and Oyewobi, L. 2014. Project success criteria, level of difficulty and performance in large engineering projects. In S. Ogulana, G. Idoro, M. Dada, A. Iweka, V. Ilechukwu and W. Alade (eds), Proceedings of CIB W107 Conference 2014: Construction in Developing Countries and its Contribution to Sustainable Development, 28-30 January 2014, Orchid Hotels & Events Centre, Lekki, Lagos, Nigeria. University of Lagos, Nigeria: CIB conference.

Windapo, A.O., Odediran, S., Oyewobi, L. and Qamata, G. 2014. Stakeholder perspectives on the use of satisfaction metrics in large engineering projects. In J. Tamosaitiene, K. Panuwatwanich, N. Mishima and C. Ko (eds), Proceedings of The 2014 (5th) International Conference on Engineering, Project, and Production Management (EPPM 2014), 26-28 November 2014, Port Elizabeth, South Africa. Port Elizabeth: Department of Construction Management, Nelson Mandela Metropolitan University. ISBN 9781920508319.

Windapo, A.O., Oyewobi, L. and Zwane, Z. 2014. Stakeholders' awareness of inherent safety design strategies within project life cycle model. In S. Ogulana, G. Idoro, M. Dada, A. Iweka, V. Ilechukwu and W. Alade (eds), Proceedings of CIB W107 Conference 2014: Construction in Developing Countries and its Contribution to Sustainable Development, 28-30 January 2014, Orchid Hotels & Events Centre, Lekki, Lagos, Nigeria. University of Lagos, Nigeria: CIB conference.

Windapo, A.O. and Oyewobi, L. 2014. Sustainable business development and the integration of economic, environmental and social sustainability issues into corporate strategies. In I. Musonda and C. Aigbavboa (eds), Proceedings of the International Conference on Infrastructure Development and Investment Strategies for Africa (DII-2014), 25-26 September 2014, Livingstone, Zambia. Doornfontein, Johannesburg, SA: Department of Construction Management and Quantity Surveying, University of Johannesburg. ISBN 9780869707821.

Yokwana, N.R., Ndihokubwayo, R. and Windapo, A.O. 2014. Impact of mentor attitude on the successful mentorship of women in the South African construction industry. In AICE – Italian Association for Total Cost Management (eds), Proceedings ICEC 2014 – IX World Congress. Re-Engineering Total Cost Management, 20-22 October 2014, Milan (Italy). Milan: FAST-Federation of Scientific and Technical Associations. ISBN 9788894014105.

Yokwana, N.R., Ndihokubwayo, R. and Windapo, A.O. 2014. Mentoring functions that contribute to career advancement in the construction industry – perspective of female mentees. In S. Laryea and E.O. Ibem (eds), Proceedings of the 8th Construction Industry Development Board (CIDB) Postgraduate Conference, 10-11 February 2014, University of Witwatersrand, Johannesburg. Johannesburg: School of Construction Economics

and Management, University of the Witwatersrand. ISBN 9780956606082.

Yokwana, N.R., Ndihokubwayo, R. and Windapo, A.O. 2014. The influence of mentorship on the knowledge productivity and performance of female mentees in the South African construction industry. In AICE – Italian Association for Total Cost Management (eds), Proceedings ICEC 2014 - IX World Congress. Re-Engineering Total Cost Management, 20-22 October 2014, Milan (Italy). Milan: FAST-Federation of Scientific and Technical Associations. ISBN 9788894014105.

DEPARTMENT OF MECHANICAL ENGINEERING

(Including the following recognised research groupings: Blast Impact and Survivability Research Unit (BISRU), the Centre for Materials Engineering (CME), the Centre for Research in Computational and Applied Mechanics (CERECAM) and the Energy Research Centre (ERC)).

Head of Department:
Professor Robert Knutsen

Department Profile

The Department of Mechanical Engineering hosts strong academic and technical expertise that underpins its thriving postgraduate activity and cutting edge research work. The Department is committed to creating intellectual capital, growing human expertise and contributing to industry through critical research and development. The programmes are led by a professional staff of experienced academics and practitioners, many of whom are recognised as world leaders in their fields. These programmes are geared to educate and train high calibre engineers for a professional career. A key objective of the Department is to be the centre of expertise in South Africa in its areas of research, to provide a link between industry and academia, and to provide postgraduate training in such a form that its graduates make a real contribution to South African industries and the global environment.

The Department offers a range of postgraduate programmes from Honours through to PhD level, designed to appeal to anyone who wishes to broaden their knowledge and develop research based skills for their future careers. There are options available for fully project-based qualifications and also for more structured Masters programmes (comprising coursework and a smaller research project component). Whichever option is pursued, students are carefully guided through their projects by experts in their chosen research area.

Some areas of research currently being explored include: bio-engineering; high performance machining and manufacturing process optimisation; flight dynamics, formation flight and parafoil research; materials characterisation at very high strain rates; blast resistant structures; human body response to blast and impact events; metal alloy development and deformation processing; composite materials processing; computational solid, structural and particulate mechanics; computational fluid dynamics; 3-D aeroelastic modelling for transonic flight; free-surface modelling technology; parallel mesh generation for multi-physics applications; heat transfer; poverty alleviation, energy and developmental needs; power plant process modelling; materials behaviour in power plant; climate change

mitigation; engineering management and systems theory; non-destructive evaluation of materials and structures; robotics; and engineering education research.

The Mechanical Engineering Department also hosts the DST/NRF SARChI chair in Industrial Computational Fluid Dynamics.

Departmental Statistics

Permanent and Long-Term Contract Staff

Professor	6
Associate Professor	7
Senior Lecturers	9
Lecturers	2
Part-time Lecturer	2
Academic Development Lecturer	1
Teaching Assistants	8
Technical Support Staff	9
Administrative and Clerical Staff	4
Workshop Apprentices (Temporary)	2
Total	**50**

Honorary Staff

Emeritus Professors	1
Adjunct Professors	2
Honorary Professors	1
Honorary Research Associates	1
Total	**5**

Students and Postdoctoral Fellows

Postdoctoral	2
Doctoral	40
Masters	157
PG Diploma	1
Honours	15
Undergraduates	560
Occasional – Non degree UG	0
Occasional – Non degree PG	0
Total	**775**

Research Fields and Staff

Permanent staff

ASSOCIATE PROFESSOR TUNDE BELLO-OCHENDE

Convective and numerical heat transfer; thermodynamic optimisation, renewable and complex energy system, constructal theory and design
Tunde.Bello-Ochende@uct.ac.za

ASSOCIATE PROFESSOR BRANDON COLLIER-REED

Deputy Dean: Undergraduate Education; engineering education; nature of technology; technological literacy of adolescents; the use of ICTs in teaching and learning
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MR TREVOR CLOETE

Senior Lecturer; BISRU, CERECAM; deformation and tearing of blast loaded metal plates; high strain rate plasticity; constitutive modeling
Trevor.Cloete@uct.ac.za

MR DIRK FINDEIS

Senior Lecturer; non-destructive testing; portable ESPI and shearography
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DR SARAH GEORGE

Senior Lecturer; CME, physical metallurgy.
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DR REUBEN GOVENDER

Senior Lecturer; BISRU; high strain rate material characterisation; composite materials; blast and impact loading of structures and materials
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MR ERNESTO ISMAIL

Senior Lecturer; BISRU, CERECAM; meshless methods, nonlinear elasticity
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ASSOCIATE PROFESSOR FRANZ-JOSEF KAHLEN

Lean/advanced manufacturing; laser materials processing; laser diagnostics
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DR BRUCE KLOOT

Academic Development Lecturer; sociology of education; higher education studies; foundation and extended curriculum programmes; student success and progression
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Advanced manufacturing; micro/nano systems
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PROFESSOR ROBERT KNUTSEN

Head of Department; Director, Centre for Materials Engineering; physical metallurgy; thermo-mechanical processing; texture; microstructure; microscopy
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BISRU; CREE; blast response of structures and materials; high strain rate behaviour; structural impact
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Computational Fluid Dynamics
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Lecturer; control systems and related fields modelling and research
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Director, BISRU; structural impact; crashworthiness; high strain rates; impact biomechanics
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Autonomously guided parafoils, airliners in formation flight
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EPPEI Specialisation Centre in Energy Efficiency; thermofluids process modelling; analysis, design and optimisation of power plants and thermofluid systems.
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Senior Lecturer; Engineering Management; management and engineering education, systems theory and practice
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PROFESSOR ROBERT TAIT

Centre for Materials Engineering; fracture mechanics; fatigue; assessment of residual stresses in structural components; applied non-destructive testing
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DR GEORGE VICATOS

Senior Lecturer; heat transfer and refrigeration; combined absorption and compression refrigeration cycles; bioengineering prosthesis design
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ASSOCIATE PROFESSOR CHRIS VON KLEMPERER

Composite materials; processing and modelling of composite materials and structures
Chris.vonKlemperer@uct.ac.za

Contract staff

MS TRACY BOOYSEN

Lecturer; Electro Mechanical engineering, robotics and agents
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DR WIM FULS

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DR ANDREW MCBRIDE

Senior Research Officer: CERECAM and Applied Mechanics; Nonlinear continuum mechanics; plasticity; finite element method; granular systems
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PROFESSOR BERNHARD SONDEREGGER

Centre for Materials Engineering, creep, damage and mechanical behaviour of power plant materials
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Adjunct Professors

PROFESSOR ANDY YATES

Adjunct Professor, SASOL Advanced Fuels Lab, engines and fuels
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PROFESSOR LOUIS JESTIN

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Emeritus Professors

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Energy Research Centre; energy research
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PROFESSOR JASSON GRYZAGORIDIS

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Honorary Research Associates

DR GARETH FLOWEDAY

SASOL Advanced Fuels Lab

PROFESSOR DORA KARAGIOZOVA

Honorary Professor; BISRU; analytical and computational analysis of dynamic systems
D.Karagiozova@gmail.com

Contract Research Staff

MR MOGAMAT AHJUM

Junior Research Fellow; ERC; energy systems analysis, Modelling

MR VICTOR BALDEN

Research Officer, BISRU; impact dynamics

DR BOTHWELL BATIDZIRAI

Senior Research Officer; ERC; Energy, Poverty & Development

MR MICHAEL BOULLE

Assistant Research Officer; ERC; energy & Climate Change

MS ANYA BOYD

Assistant Research Officer, ERC; energy, environment and climate change UCT research report / 2013–14 267

DR STEEVE CHUNG KIM YUEN

Research Officer, BISRU; structural dynamics, blast response, crashworthiness

MR GRAHAM GARISEB

Energy Efficiency Engineer, ERC

MR ANDREW HIBBERD

Energy Efficiency Engineer, ERC; measurement and verification

MS ALISON HUGHES

Senior Research Officer, ERC; energy efficiency; energy modelling

MRS SAMANTHA KEEN-JENNER

Research Officer; ERC; energy & Climate Change

MR RICHARD LARMOUR

Research Officer, ERC; Measurement and verification

DR ANDREW MARQUARD

Senior Research Officer, ERC; energy and climate change team

MR BRYCE MCCALL

Junior Research Fellow, ERC; Energy systems analysis, Modelling

MS MASCHA MOORLACH

Energy Efficiency Engineer, ERC; measurement and verification

DR AMOS MADHLOPA

Senior Research Officer; ERC; new & renewable energy technologies

MR BRUNO MERVEN

Research Assistant; ERC; energy systems analysis, modelling

MR ALFRED MOYO

Research Officer, ERC; energy & climate change group

DR GISELA PRASAD

Chief Research Officer, ERC; energy, poverty and development

DR BRITTA RENNKAMP

Research Officer, ERC; energy and climate change

MRS MAMAHLOKO SENATLA

Research Officer, energy systems analysis & planning

DR DEBBIE SPARKS

Senior Research Officer, ERC; energy and climate change

MR ALISTAIR STEWART

Senior Energy Efficiency Engineer, ERC

MR ADRIAN STONE

Senior Research Officer, ERC; energy systems analysis, modelling

MS LOUISE TAIT

Research Officer; ERC; Energy, Poverty & Development

DR MARTA TORRES GUNFAUS

Chief Research Officer, ERC; climate change

MR HILTON TROLLIP

Senior Research Officer; ERC; Energy & Climate Change

PROFESSOR HARALD WINKLER

Director: ERC; climate change (economics, mitigation & policy) and environmental economics

Postdoctoral Research Fellows

DR LABINTAN CONSTANT

Energy studies specialisation

DR JULIEN GHIGHI

Materials engineering specialisation

DR TAMARYN NAPP

Energy studies specialisation

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RESEARCH OUTPUT

Chapters in books

Chung Kim Yuen, S. and Nurick, G.N. 2014. The use of tubular structures as cores for sandwich panels subjected to dynamic and blast loading: a current "state of the art". In A. Shukla and Y.D.S. Rajapakse and M.E. Hynes (eds), Blast Mitigation, pp. 229-248. New York: Springer. ISBN 9781461472667.

Labintan, A.C. and Winkler, H.E. 2014. Linkage of agricultural productivity improvement and climate change mitigation action in Africa. In M. Hermann (ed), Handbook on Climate Change and Adaptation, pp. 1-17. New York: Springer Science + Business Media. ISBN 9783642404559.

Articles in peer-reviewed journals

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Chung Kim Yuen, S., Nurick, G.N., Piu, s. and Ebrahim, G. 2014. Response of filled thin-walled square tubes to axial impact load. In H. Kobayashi, T. Yokoyama, and T. Adachi (eds), Proceedings of the 8th International Symposium on Impact Engineering, Applied Mechanics and Materials, Volume 566, 2014, 2-6 September 2013, Osaka, Japan. Switzerland: Trans Tech Publications Ltd. ISBN 16609336.

Chung Kim Yuen, S., Nurick, G.N. and Du Plessis, M.C. 2014. Response of sandwich panels with tubular cores to blast load. In H. Kobayashi, T. Yokoyama, and T. Adachi (eds), Proceedings of the 8th International Symposium on Impact Engineering, Applied Mechanics and Materials, Volume 566, 2014, 2-6 September 2013, Osaka, Japan. Switzerland: Trans Tech Publications Ltd, Switzerland. ISBN 16609336.

Chung Kim Yuen, S., Nurick, G.N. and du Plessis, M.C. 2014. Response of sandwich panels with tubular cores to blast load. In H. Kobayashi, T. Yokoyama, and T. Adachi (eds), Proceedings of the 8th International Symposium on Impact Engineering, Applied Mechanics and Materials, Volume 566, 2014, 2-6 September 2013, Osaka, Japan. Switzerland: Trans Tech Publications Ltd, Switzerland. ISBN 16609336.

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Dhansay, N.M., Tait, R.B. and Becker, T. 2014. Fatigue and fracture toughness of Ti-6Al-4V titanium alloy manufactured by selective laser melting. In H. Moller and U.A. Curle (eds), Proceedings of the AMI Light Metals Conference 2014, 15-17 October 2014, Pilanesberg National Park, South Africa. Switzerland: Trans Tech Publications Ltd. ISBN 9783038352341.

Findeis, D. and Gryzagoridis, J. 2014. Digital shearography and vibration excitation for NDT of aircraft components. In E.P. Tomasini (ed), Proceedings of the 11th International Conference on Vibration Measurements by Laser and Noncontact Techniques – AIVELA 2014: Advances and Applicatons. AIP Conf. Proc., 25-27 June 2014, Ancona, Italy. USA: AIP. ISBN 9780735412347.

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Mwesigye, A., Bello-Ochende, T. and Meyer, J. 2014. Heat transfer enhancement in a parabolic trough receiver using perforated conical inserts. Proceedings of the 15th International Heat Transfer Conference, IHTC-15, 10-15 August 2014, Kyoto, Japan. New York, USA: Begell House Inc. ISBN 9781567004212.

Ngo, L.C., Bello-Ochende, T. and Meyer, J. 2014. Numerical modelling of combined natural convection and surface radiation heat transfer in cavity receiver with plate fins. Proceedings of the 15th International Heat Transfer Conference, IHTC-15, 10-15 August 2014, Kyoto, Japan. New York, USA: Begell House Inc. ISBN 9781567004212.

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Pandelani, T., Reinecke, J.D., Sono, T.J., Ahmed, R., Beetge, F.J., Nkosi, P., Dicks, P. and Nurick, G.N. 2014. The design of a modified lower limb impactor to assess lower limb injury at typical blast loading rates. Proceedings of the 9th South African Conference on Computational and Applied Mechanics (SACAM 2014), 14-16 January 2014, Somerset West, South Africa. South Africa: South African Association for Theoretical and Applied Mechanics. ISBN 9781634397162.

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DEPARTMENT OF ELECTRICAL ENGINEERING

Head of Department: Professor M Braae

Departmental Profile

The Department of Electrical Engineering has 25 permanent academic staff, 182 Masters Students and 81 PhD students. The research activities and projects are largely industrially based. The main funding sources include Eskom, Telkom, De Beers, Sasol, Mintek, Water Research Commission, Anglo Platinum, Department of Trade and Industry, Dept of Science and Technology (DST), South African National Defence Force, Reutech Radar Systems and Peralex (Pty) Ltd and the National Research Fund.

The Department has seen a growth in the number of undergraduate students over the past ten years, which is expected to result in higher postgraduate numbers. There are six large research groupings in the Department most attract 80% of the postgraduate students. These are:

- Broadband, Wireless, Communication, and Networks
- Electrical Machines and Power Electronics
- Image Processing and Vision Systems
- Control and Instrumentation
- Power Engineering
- Remote Sensing and Radar

Departmental Statistics

Permanent and Long-term Contract Staff

Professors	6
Associate Professors	8
Adjunct Associate Professor	1
Adjunct Senior Lecturer	1
Senior Lecturers	6
Lecturers	6
Research Staff	2
Senior Scholar	1
Technical Support Staff	7
Administrative Staff	8
Total	**46**

Emeritus Professors

Emeritus Professors	**5**

Students and Postdoctoral Fellows

Undergraduate	716
Honours	4
Masters	182
Doctoral	81
Occasional	16
Postdoctoral	3
International Affiliate	1
Total	**1003**

Research Fields and Staff

PROFESSOR A. BAGHAI-WADJI

Electronic and Accelerated Computational Engineering

PROFESSOR E.S. BOJE

Control Systems and Mechatronics

PROFESSOR M. BRAAE

Multivariable control; mineral extraction control applications; computer-based education

PROFESSOR M.R. INGGS

Radar remote sensing; synthetic aperture radar; software defined radio; parallel computing

PROFESSOR P. MARTINEZ

Space science and technology, astrophysics, space policy and space law

PROFESSOR P. PILLAY

Electrical machines and drives

ASSOCIATE PROFESSOR, P.S BARENDSE

Electrical machines, Electric drives and Condition Monitoring

ASSOCIATE PROFESSOR M.E. DLODLO

Wireless communication systems, software-defined radio, cognitive radio, video streaming

ASSOCIATE PROFESSOR K. FOLLY

Power system stability and control; renewable energy; smart grid; computational intelligence

ASSOCIATE PROFESSOR R.H. GESCHKE

Microwave and Millimeter-wave Engineering

ASSOCIATE PROFESSOR M.A. KHAN

Electrical Machines, Electric Drives and Wind Energy Systems

ASSOCIATE PROFESSOR, F.C. NICOLLS

Image processing, signal processing and computer vision

ASSOCIATE PROFESSOR D.W. O'HAGAN

Radar: Multistatic, Bistatic, Commensal, Propagation and Antennas

ASSOCIATE PROFESSOR A.J. WILKINSON

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ADJUNCT PROFESSOR P.J. CILLIERS

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ADJUNCT ASSOCIATE PROFESSOR M. MALENGRET

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DR S. CHOWDHURY

Senior Lecturer, Renewable distributed generation, power system protection, microgrids and smartgrids

DR O.E. FALOWO

Senior Lecturer, Communication Networks

MR. S. GINSBERG

Senior Lecturer; Digital systems

DR M. HANIF

Senior Lecturer, Power Electronics Converters and Control, Photovoltaic Power Conditioning, Renewable Integration Issues

DR A. MISHRA

Senior Lecturer; Radar Signal Processing and Machine Learning

DR A. MURGU

Senior Lecturer, Telecommunications, Networks, IP and Network Reliability

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MR. M.J.E. VENTURA

Senior Scholar, Broadband Networks & Applications, Internet of Things

DR A. VAN DER BYL

Research Officer, Image and signal processing and re-configurable computing

Honorary/Emeritus Professors

PROFESSOR B.J. DOWNING

Microwave systems and circuits

EMERITUS PROFESSOR G. DE JAGER

Image processing; machine vision and image compression

PROFESSOR C.T. GAUNT

Electricity delivery networks

EMERITUS PROFESSOR A. PETROIANU

Power system analysis; operation and control

EMERITUS PROFESSOR K.M. REINECK

Antennas

EMERITUS ASSOCIATE PROFESSOR J.R. GREENE

Computational Intelligence

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RESEARCH OUTPUT

Chapters in books

Ajibesin, A., Ventura, N.M., Chan, H.A. and Murgu, A. 2014. Service productivity in IT: a network efficiency measure with application to communication systems. In A. Emrouznejad and E. Cabanda (eds), Managing Service Productivity Using Frontier Efficiency Methodologies and Multicriteria Decision Making for Improving Service Performance, pp. 241-261. London: Springer. ISBN 9783662434376.

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