

Postgraduate Research Opportunities

Department of Research and Innovation Support

www.up.ac.za





Graduate Support Hub

For more information on postgraduate research opportunities at the University of Pretoria, contact the Graduate Support Hub in the Department of Research and Innovation Support.

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Postgraduate Research Opportunities

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Message from the Vice-Principal: Research and Postgraduate Education



As a leading University in South Africa and the largest researchintensive university in the country, the University of Pretoria (UP) offers a world of opportunity for postgraduate study. Through our guiding strategic plan, UP 2025, we are committed to developing our research profile and our international stature, and postgraduate education is at the heart of these key objectives.

The University hosts and supports postgraduate study and research in a very broad and comprehensive range of fields, and all our postgraduate students have the opportunity to be

Greetings to all postgraduate and prospective postgraduates who may read this booklet to gain insight into the **University of Pretoria** as a place to study. I congratulate any student who considers studying for a higher degree - it is a real investment in yourself and your future career, and I encourage you to read further.

mentored by international leaders in their specific disciplines. Our research focus areas are positioned according to our strategic goals, our existing and developing expertise, and the national and international roles of our research leaders

We actively encourage multidisciplinary collaboration. Within the University, certain research areas are clustered into Institutional and Faculty Research Themes – areas of unique research strengths that are designed to foster strong multidisciplinary research. Opportunities for master's and doctoral study exist within, as well as

alongside, these research themes in all of our nine faculties and more than 100 research institutes, centres and units. This booklet will provide some insight into these research focus areas and opportunities.

We are also proud to be able to provide an attractive and enabling environment for our postgraduate students, with excellent research facilities, very well-equipped laboratories, unique medical and veterinary clinical facilities, state-ofthe-art libraries, Research Commons areas, postgraduate residences and a dedicated Graduate Support Hub. This environment is conducive to research excellence, which in turn impacts very positively on the postgraduate training we can offer. The Graduate Support Hub provides dedicated advisory support and offers customised skills development training related to postgraduate studies and research.

The University of Pretoria has many international collaborative networks and agreements in place with Universities abroad, providing opportunities for our postgraduates to be exposed to international expertise, theories and debates. Working with

internationally recognised academics, UP postgraduates emerge highly skilled and capable of contributing to their individual countries' needs in a variety of contexts.

The University aims to increase its contribution in terms of the number of postgraduates who achieve higher degrees in research and professional fields, becoming a part of our national and regional cohort of highly qualified and skilled experts.

Linvite all interested students to consider pursuing postgraduate studies at the University of Pretoria. We particularly encourage international students to consider joining the University.

Prospective postgraduate students are encouraged to visit the University's website, www.up.ac.za, to learn more about postgraduate opportunities at the University of Pretoria.

Prof Stephanie Burton

Vice-Principal: Research and Postgraduate Education

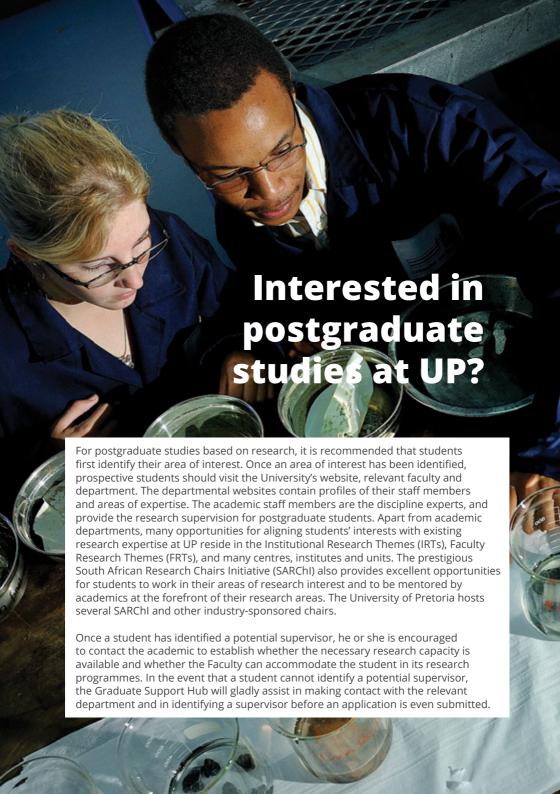
UP at a glance

The University of Pretoria celebrated its centenary in 2008 and has seen its academic tradition and stature mature over the century. In 107 years, the University of Pretoria has delivered close to 230 000 alumni. The University currently has more than 63 000 registered students. Just over 13 000 of these are postgraduate students. Of these postgraduate students, more than 4 000 are international students, 67% of whom are from the Southern African Development Community (SADC) countries. The strong postgraduate student presence places UP at the forefront of academic training in southern Africa and the rest of the continent. In 2013, UP awarded 242 PhD degrees, contributing to the pool of highly skilled human capital.

The University has nine faculties and a business school, namely Economic and Management Sciences, Education, Engineering, Built Environment and Information Technology, Health Sciences, Humanities, Law, Natural and Agricultural Sciences, Theology, Veterinary Science (presently the only faculty in this discipline in South Africa) and the Gordon Institute of Business Science (GIBS). The academic programmes are offered in 141 academic departments and 100 research centres, institutes, units and bureaux.

The following researchers hold an A-rating from the NRF based on the fact that they are unequivocally recognised by their peers as leading international scholars in their field for the high quality and impact of their recent research outputs.

- Prof Andries Engelbrecht (Computer Science)
- Prof Yves van de Peer (Genetics)
- Prof Nigel Bennett (Zoology and Entomology)
- Prof Drucilla Cornell (Jurisprudence)
- Prof Don Cowan (Genetics)
- Prof Robert Millar (Zoology and Entomology)
- Prof Brian Rand (Institute of Applied Materials)
- Prof Johan van der Vyver (Private Law)
- Prof Charles van Onselen (Centre for the Advancement of Scholarship)
- Prof Johannes van Oort (Church History and Church Polity)
- Prof Brenda Wingfield (Genetics)
- Prof Mike Wingfield (Forestry and Agricultural Biotechnology Institute)
- Prof Xiaohua Xia (Electrical, Electronic and Computer Engineering)



Research excellence at UP



Research at the University of Pretoria encompasses a very broad range of disciplines across its nine faculties and one business school, and more than 60 research institutes, centres and units. The University of Pretoria's major and bestrecognised research strengths are in the following areas:

- Agricultural and biological sciences
- Medicine
- Engineering
- Biochemistry
- Genetics
- Molecular biology
- Plant and animal sciences
- Environmental science
- Earth and planetary sciences
- Computer sciences

Recognising these strengths and in keeping with international research trends, the University has established Institutional and Faculty Research Themes. These seek to foster multidisciplinarity in addressing global research challenges while capitalising on the areas of excellence in the University.



Animal and Zoonotic Diseases

This theme is a collaborative network of researchers from multiple disciplines who conduct research to achieve optimal health for people, animals and the environment, through 21st-century science and technology. It is based on the University's current strengths and leading research capacity in the faculties of Health Sciences, Veterinary Science and Natural and Agricultural Sciences. As the only university with a faculty of veterinary science, this theme presents a unique opportunity for further research growth in the field.

The domain of animal health has undergone an almost unprecedented increase in importance in the last century. Today, it is inextricably linked to our local and global economy, as well as societal issues such as public health, food and food security. Animal pathogens also affect humans and as much as 60% of human pathogens are zoonotic, indicating that diseases can be transmitted from animals to humans.

This overlap in veterinary, human and ecological health sciences requires what is known as the 'One Health' concept, a collaborative local, national and global effort with a multidisciplinary focus on aspects of the research and management of zoonoses and animal diseases.

The best and most relevant tools are also needed to address the disease-related research questions. In this respect, modern molecular technologies have radically changed the way in which problems in diagnostics, epidemiology, vaccine development and ecology are approached. These technologies will be used to increase the University's research capacity and establish a highly regarded research focus area in the field of animal health and zoonoses that will gain high local and international standing through its leading role in South Africa and the rest of the world.

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Capital Cities Project

The Capital Cities Project (CCP) is an exciting cross-faculty research project initiated by the Faculty of Humanities and involves several other faculties within the University, such as the faculties of Law, Health Sciences, Natural and Agricultural Sciences, Engineering, Built Environment and Information Technology, Theology, and Economic and Management Sciences.

For the first time in human history, the majority of the world's population now lives in cities. This dynamic, coupled with the resurgence of the importance of capital cities in the wake of the global economic crisis, makes the city in which this University is located an important site for research. This dynamic presents researchers with an opportunity to overcome the challenges that face our city, society and the world.

This research theme recognises capital cities as seats of power: living symbols of a government in action. Monuments, government buildings, cultural landmarks, public spaces, schools, universities and the recreational facilities in a capital city tell countless stories about countries. A capital city is also an abstract space, a symbol, a place studied by historians and ethnographers, narrated by novelists, analysed by sociologists and psychologists, interpreted and appropriated by artists, and contemplated by philosophers. All these aspects are the focus of the CCP.

Visit the website at www.up.ac.za/capitalcities.

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Energy

After evaluating relevant government policies and strategies pertaining to the wider energy theme in South Africa, the University concluded that a focused and concerted effort was necessary to ensure that the country is successful in bringing the goals of government's Integrated Resource Plan (IRP) to fruition. In order to address these challenges effectively, while contributing to the aims of the IRP, a number of subthemes in the wider electrical energy theme were identified that needed to be addressed.

The IRT on Energy was therefore established in the Faculty of Engineering, Built Environment and Information Technology with the express purpose to set the University on the road towards national relevancy in its guest for solutions to South Africa's energy problems. Achieving research excellence in this area allows the University to enhance the international recognition it enjoys in the field of energy research.

This research theme provides an optimal link between the University's current research activities and the energy focus areas that are prioritised by the national government, through multidisciplinary and transdisciplinary research conducted in the faculties of Engineering, Built Environment and Information Technology, Natural and Agricultural Sciences, and Economic and Management Sciences.

The IRT focuses the University's research efforts on a number of carefully selected subthemes relevant to South Africa's future energy security, such as energy generation, distribution, transmission and optimisation, advanced materials, energy and the environment, and policy, economics and society. These selected research areas all enjoy international interest.

Initially, six new high-impact research projects will be undertaken and will serve as a benchmark for the initiative's future project portfolio development. This will also allow the IRT to become relevant to the wider industrial energy sector from the outset. Contact with the energy sector and the multidisciplinary nature of the research projects within the realm of the IRT will furthermore facilitate efforts to obtain funding from outside sources.

Visit the website at http://web.up.ac.za/energy.

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Food, Nutrition and **Well-being**

The IRT on Food, Nutrition and Well-being seeks to address the emerging societal challenges related to food insecurity, nutrition deficiencies and hunger, especially in Africa. Through this theme, research conducted in the faculties of Health Sciences, Veterinary Science, and Natural and Agricultural Sciences is coordinated to support an intensive network of researchers, and develop policy and solutions for Africa and the world.

It has been a vehicle to create an Institute of Food, Nutrition and Well-being that intends to become a leading international centre for transdisciplinary research and postgraduate training. Its objective is to find innovative and comprehensive ways of addressing current constraints to attain the Millennium Development Goals with regard to food, nutrition and well-being in sub-Saharan Africa by the year 2020. In the process, it plans to strategically position the University of Pretoria as an internationally recognised Centre of Excellence.

The focus of research conducted by the Institute is to promote the long-term health and wellness of people, support sound policy-making with regard to food, nutrition and well-being, and (together with strategic national, regional and international partners) significantly scale up capacity in this area through the development of leading professionals and upcoming researchers. As such, the Institute explores current and complex research questions through transdisciplinary enquiry that generates new knowledge and insights to help reduce hunger and poverty in Africa. It brings together over 100 academic staff across faculties in the various related areas, providing the largest pool of food security-related expertise in one institution globally.

The following key research programmes have already been identified:

- Sustainable animal- and plant-based food production in a resourceconstrained environment
- Food safety, biosecurity, public health and regulatory control
- Functional biomolecules and functional foods
- Facilitating behaviour change for health and well-being
- The food security and nutritional impacts of policies and programmes

Visit the website at http://web.up.ac.za/ifnuw.

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Genomics

The IRT on Genomics was established with a strong core capacity for genomics, bioinformatics and computational biology research. As the newest revolution in the biological sciences, genomics studies the total genetic complement of any organism. Genome studies therefore have the potential to stimulate enormous advances in fields as diverse as plant breeding, human health and the use of indigenous bioresources.

The well-established Bioinformatics and Computational Biology Unit currently has some of the most advanced genomics and transcriptomics analysis capacity in South Africa. Individual research groups at the University have embarked on and completed many significant research projects on the vast amount of information that can be derived from viral, bacterial, fungal and plant genomes. Scientists in the health sciences, veterinary science and other life sciences at the University can therefore make an important contribution in South Africa and internationally.

DNA sequencing, which is the core technology that links all genomics, is the heart of the genomics technology revolution. The challenge facing genomic scientists is to take advantage of the enormous power and scope of the new genome sequencing technology to learn new skills, embrace new approaches and define new questions.

The Genomics Research Institute (GRI) is active in three major sectors: environmental genomics, human and health genomics, and plant and animal genomics. It actively promotes the development of genomics applications across the faculties of Natural and Agricultural Sciences, Veterinary Science and Health Sciences by providing seed-fund grants, and supporting genomics researchers with bioinformatics training and data analysis in order to develop new, cuttingedge, interdisciplinary research projects.

Visit the website at www.up.ac.za/genomics-IRT.

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Cellular and Molecular Medicine

The Institute for Cellular and Molecular Medicine (ICMM) has a solid research base in human health sciences, and is entering a phase of rapid growth as it responds to the heavy national and regional burden of communicable and non-communicable diseases. The Institute's activities include several crosscutting areas such as genetics/genomics, cell-based therapy, the neurosciences, bioentrepreneurship and the regulatory (legislative) environment.

The ICMM aims to promote cutting-edge high-impact research in human health. It is a virtual institute with a core component in the Department of Immunology. The Institute comprises 20 research groups in seven of the nine faculties at the University and promotes collaborative research that is multidisciplinary and interdepartmental in nature. Strong links also exist between groups within the ICMM, as well as national and international partners and collaborators.

The Institute is built around themes that include infectious diseases, cancer and the neurosciences, with cell therapy (stem cells) and genomics as cross-cutting disciplines. It is also involved in projects on human tissue legislation, since many of the areas in which research is being conducted have complex ethical, legal and social components. Two of the major focus areas are stem cells and the human genome.

Stem cells are the building blocks of the body, and in recent years, their potential to treat and cure a number of life-threatening diseases has been recognised. The Institute has developed a world-class stem cell facility that is involved in the isolation, characterisation and manipulation of stem cells for therapeutic purposes.

Work on the human genome is aligned with the priorities of the Southern African Human Genome Programme (SAHGP). Given the well-recognised genetic diversity of our population, South Africa is well positioned to make major contributions to understanding the origin and mechanisms of globally important communicable and non-communicable diseases.

Visit the website at http://web.up.ac.za/ICMM.

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Sustainable Malaria Control

The University of Pretoria Centre for Sustainable Malaria Control (UP CSMC) was established to promote collaborative research in the Faculty of Health Sciences on safer and more sustainable control and management of malaria. Research is focused on combating malaria effectively without risks to human health. The Faculty Research Theme is a multidisciplinary, interdepartmental and interfaculty platform that consolidates existing research expertise in terms of malaria control. The University enjoys wide support for this initiative, and is strategically aligned with the national Department of Health and other partners regarding the control and elimination of malaria.

The UP CSMC has three active research clusters: health, vector control and parasite control, with several cross-cutting fields. Environmentally friendly ways of delivering chemicals for malaria control are among the novel ideas being explored. A transdisciplinary approach is followed, with experts from the faculties of Health Sciences, Natural and Agricultural Sciences, Engineering, Built Environment and Information Technology, Economic and Management Sciences, Veterinary Science, and Education collaborating on research projects. Community involvement, education and health promotion are important components of the Centre's activities.

As a result, the Centre is making a substantial contribution towards the creation of a malaria-free Africa by employing sustainable and environmentally safe malaria control technologies, establishing integrated vector management strategies, ensuring effective malaria case management, and promoting health education among affected populations.

The South African Research Chairs Initiative (SARChI) Chair on Sustainable Malaria Control, which was established in 2013, plays a key role in facilitating and supporting research expertise in sustainable malaria control, contributing to the National Malaria Programme's aim to eliminate malaria by 2018.

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Enhancing the well-being of vulnerable children

As a research theme, Enhancing the well-being of vulnerable children focuses on vulnerable children, from birth to 18 years old, in various resource-constrained environments in South Africa. A vulnerable child is a child whose survival, care, protection and/or development may be compromised by any condition, situation or circumstance that may deprive the child of his or her rights and development to the fullest extent of his or her capacity. In this programme, the focus is on children who are vulnerable for various reasons. In 10 to 20 years, these children will become the backbone of South African society and could be contributing substantially in all sectors. It would be short-sighted to neglect the majority of children growing up in South Africa.

This project aims to demonstrate that the humanities can contribute substantially to progress in South Africa by facilitating the healthy development of children. Inputs to support research methodology, as well as scientific support, are therefore provided to serve the two main objectives of the project.

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Human Economy Programme

The idea of a human economy emerged out of a global social movement started at the World Social Forum over a decade ago. Much work has already been done to give substance to this idea. The Human Economy Programme attracts scholars with backgrounds in sociology, history, anthropology, development studies, economics and education. To date the programme has recruited a large number of doctoral students and postdoctoral fellows from around the world. The programme is interdisciplinary in nature, and its current participants have backgrounds in sociology, history, anthropology, political science, development studies and economics. Since July 2013, the programme has been housed in the Centre for the Advancement of Scholarship at the University of Pretoria.

Through case studies, this programme examines how people insert themselves into economic life, and ways in which people engage with the economy and respond to institutional forms that perpetuate structures of inequality (creating, challenging or even trying to ignore them). The human economy is perceived as being made and remade by people themselves, based on a holistic conception of human needs and with the interests of humanity as a whole in mind.

The aims of the programme are both academic and practical. It builds a body of research pertaining to the issue of nurturing and expanding economic democracy, particularly in Africa and the global south, and wishes to communicate these findings accessibly to a wider public in order to support popular movements aimed at achieving economic democracy.

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Institute for International and Comparative Law

The Institute for International and Comparative Law (ICLA) is unique to the continent. As a research institute, it was established to generate knowledge and develop research capacity at the highest level within African territorial, legal and language limits, as well as within the parameters of international and comparative law.

Through research and postgraduate guidance, the ICLA is positioning itself as a major contributor to advanced legal knowledge and capacity in the broader African and global community. Its objective is to become a first port of call for those who wish to engage in legal research and legal reform in Africa. As a continental focal point, it strives to develop a community of scholars from a wide range of countries and institutions who will promote the role and rule of law in Africa through advanced research.

Its activities are furthermore aimed at serving as the point of convergence and institutional memory for judicial and legislative reform across the continent, contributing towards theoretical and critical analyses of law in Africa, constituting a base from which the legal systems of African countries can be accessed by other regions and international organisations, and linking African legal scholars with those in the rest of the world at the cutting edge of contemporary research on international and comparative law.

Visit the website at www.up.ac.za/icla.

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Peace and conflict

Peace and conflict is an inescapable theme for scholars and students involved in the social sciences in South Africa. The African continent is faced with many challenges in making the transition from conflict to sustainable peace. These challenges affect states and societies at the political, economic and social levels. within national territories and across boundaries of race, class, gender and territory.

This research project can make a unique contribution to scholarship as it features a vital normative concern around peace and security in the region – in this case human security. It also explores how gradations of conflict influence the attainment of human security and peace in southern Africa. By moving away from the tendency (in research led by political science) to focus on powerful actors and groupings, such as states, institutions and elite groupings, it can focus predominantly on individuals and communities affected by conflict situations. As a multidisciplinary initiative, it strives to involve disciplines such as sociology, psychology, history and gender studies.

The research project provides a platform for collaboration between scholars and students, primarily – but not exclusively – in the disciplines of political sciences, sociology, social work, history, psychology and the multidisciplinary field of gender studies. Research and scholarship relating to peace and conflict is being conducted in each of these disciplines. This multidisciplinary research project gives participants the opportunity to transcend the empirical observations and theoretical insights of their respective disciplines and to explore new ways of seeing and approaching the research material. A number of master's degree students are already focusing their research on topics relevant to this research theme.

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Southern modernities

As a research theme. Southern modernities focuses on southern modes of modernity based on exchange and debate between thinkers in the southern hemisphere. Modernity is a largely self-referential term, which Europe uses to define itself, while it simply negates others. The concept of modernity is used by certain cultures to castigate others for their non-modernity in order to constitute themselves as the very model of modernity. It becomes paramount then, for those cultures to extricate themselves from the toils of a notion of modernity that will always marginalise them. Research conducted under this theme focuses on a counter-offensive against such hegemonic and homogenising tendencies.

This research theme attempts to achieve a critical perspective on modernity as a European concept. It was launched in 2012 by the Department of Afrikaans in the Faculty of Humanities with a one-day conference that posed some compelling questions on modernism and modernity in the global south.

Southerm modernities critically engages with 'alternative modernities' in an attempt to link differing and variegated modernities across the southern hemisphere.

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Visual technologies: critical encounters



As a research theme, Visual technologies: critical encounters aims to provide a critical examination of the specific place and role of visual technologies in shaping cultures and identities, where the word 'technology' is not used in any typically mechanistic or utilitarian logic. In their digital, curatorial, archival, creative and theoretical dimensions, visual technologies have the potential to develop transdisciplinary discourses within academic disciplines in the humanities, as well as within the spatial, informational, medial and conceptual dimensions of society.

Work conducted under this research theme investigates vision, visuality and ocular centrism in its technological dimensions and will lead to both text-based and creative outputs.

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SARChl Chairs



International Development Law and African Economic Relations Prof Danny Bradlow Faculty of Law

This research chair focuses on the global economic governance, and international legal aspects of sustainable and equitable development. Prof Viljoen's current scholarship focuses on global economic governance and the international legal aspects of sustainable and equitable development.

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Social Science Chair in Non-parametric, Robust Statistical Inference and Statistical Process Control Prof S Chakraborti Faculty of Natural and Agricultural Sciences

Among Prof Chakraborti's research interests are nonparametric statistical inferential methods, including practical applications in a variety of areas, such as statistical process control (SPC). He is the co-author of a well-known book, Nonparametric statistical inference,

fifth edition (2010), with Jean D Gibbons, published by Taylor and Francis. He has been cited for his contributions in mentoring and collaborative work with students and colleagues from around the world.

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Artificial Intelligence Prof Andries Engelbrecht Faculty of Engineering, Built Environment and Information Technology

Prof Engelbrecht's main research focus is computational intelligence, with a particular emphasis on computational swarm intelligence, learning from zero knowledge using competitive coevolution and evolutionary algorithms. His research team developed an open-source library

of computational intelligence algorithms, which is increasingly being used internationally. They were the first to provide convergence proofs of particle swarm optimisers (PSO) to develop PSO algorithms to find multiple solutions to optimisation problems and to use PSO for secondary RNA structure prediction.

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Fluoro-materials Science and Process Integration Prof Philip Crouse Faculty of Engineering, Built Environment and **Information Technology**

Prof Crouse's current research interests include the development of fluoro-polymer capability in South Africa, with a focus on polyvinylidene difluoride (PVDF), fluorinated ethylene propylene (FEP) and ethylene tetrafluoroethylene (ETFE). Other focus areas are the

benchmarking processes against polytetrafluoroethylene (PTFE), the dry fluorination of inorganic materials for surface modification (inclusive of bulk metal silicides), the modelling of fluorine cells, the various Advanced Metal Initiative (AMI) projects relating to fluoro-chemical processing, and the development of alternative high-temperature processes for the production of hydrogen fluoride directly from fluorspar.

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Carbon Technology and Materials (Vacant)

Faculty of Engineering, Built Environment and Information Technology

A new, highly active group has been established to research carbon materials. The research interests of the group are in the field of carbon and graphite materials and the processing of ceramic (refractory) materials, specifically nuclear graphite, carbon fibres and carbon-carbon composites, liquid crystalline precursors to carbon.

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Chair in Complex Systems Prof Pavel Selvshchev Faculty of Natural and Agricultural Sciences

Prof Selyshchev's specialisation is in theoretical physics, specifically complex non-linear systems and their evolution. He focuses on kinetic non-linear processes in materials under irradiation and has developed a theoretical approach to the self-organisation phenomena in irradiated materials. His research focus areas are

temporal and spatial self-organisation of defect density under irradiation, dimensional changes in irradiated materials as dissipative structures and different kinds of interactions as mechanisms of dissipative structure formation (such as force interaction between defects, thermo-concentration and thermo-elastic interdependence). Prof Selyshchev was also involved as a theorist in the development of post-Chernobyl strategies.

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Mathematical Models and Methods in Bioengineering and Biosciences (M3B2)

Faculty of Natural and Agricultural Sciences

This research focus is at the intersection of mathematical modelling of biological processes and a spectrum of mathematical specialisations. These include dynamical systems, partial differential equations and numerical analysis. The biological processes to be considered are highly relevant to the needs of the country. These include mathematical epidemiology, which covers infectious diseases of humans (such as vector-borne tropical diseases and communicable diseases such as the HIV/AIDS pandemic and tuberculosis). zoonotic diseases of wildlife areas and livestock diseases (such as foot-andmouth disease), food security versus pests, and invasive plants and animals.

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Sustainable Malaria Control **Prof Lyn-Marie Birkholz Faculty of Natural and Agricultural Sciences**

This research programme delivers biotechnological applications in infectious disease studies by combining expertise in biosciences and biotechnology. The specific focus will be on understanding the biology of gametocyte differentiation of malaria parasites, leading to transmission-blocking drugs that are anticipated to make

a substantial contribution to the alleviation of the morbidity and mortality caused by malaria.

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Tax Policy and Governance Prof Riël Franzsen **Faculty of Economic and Management Sciences**

The research activities of the Chair are aligned with the research strategies of the South African government's Department of Science and Technology. More specifically, National Treasury's fiscal policy seeks to support structural reforms of the South African economy consistent with long-term growth, employment creation and an equitable

distribution of income. It aims to promote investment and export expansion. while enabling government to finance public services, redistribution and development in an affordable and sustainable budget framework. The chair is aligned with these objectives.

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Mammalian Behavioural Ecology and Physiology Prof Nigel Bennett Faculty of Natural and Agricultural Sciences

Prof Bennett's research is focused on ecology, animal physiology and animal behaviour. His work is predominantly on the sociobiology of African rodent moles (Bathyergidae) and, in particular, the extrinsic and intrinsic factors that have led to the development of sociality in this remarkable endemic African family. His research group is

fundamentally interested in elucidating the modes and mechanisms that are responsible for reproductive suppression in non-reproductive females of the various social species.

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Advanced Sensor Networks Prof Attahiru Alfa **Faculty of Engineering, Built Environment and Information Technology**

The main focus of this programme is building research capacity in the area of advanced sensor networks, a modern and growing field, which is strategic to the economy. The first five years of the programme will target research on the mathematical aspects of wireless

sensor networks (WSN), while the subsequent five-year programme will focus on hardware, test-beds and implementation aspects. The applications to be considered will have major national interest, especially in the wildlife monitoring, soil and in-situ soil moisture analysis (for the viticulture), home security, infrastructure health monitoring and human healthcare.

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	Chair in Entrepreneurship	Prof J Van Vuuren	012 420 3401 jurie.vanvuuren@up.ac.za
	South African Reserve Bank Chair in Monetary Economics	Prof Nicola Viegi	012 420 3820 nicola.viegi@up.ac.za
	SARChI Chair in Tax Policy and Governance	Prof Riël Franzsen	012 420 5538 riel.franzsen@up.ac.za
Engineering, Built Environment and	SARCHI Chair in Carbon Technology and Materials	Prof Brian Rand	012 420 4173 b.ca.rand@btinternet.com
Information Technology	SARCHI Chair in Fluoro-material Science and Process Integration	Prof Philip Crouse	012 420 2856 philip.crouse@up.ac.za
	SARChI Chair in Artificial Intelligence	Prof Andries Engelbrecht	012 420 3578 engel@cs.up.ac.za
	Chair in Railway Engineering	Prof Hannes Gräbe	012 420 2741 hannes.grabe@up.ac.za
	Sentech Chair in Broadband Wireless Multimedia Communication	Prof Sunil Maharaj	012 420 4636 sunil.maharaj@up.ac.za
	Exxaro Chair in Energy Efficiency	Prof Xiaohua Xia	012 420 2165 xxia@up.ac.za
	Chair in Maintenance Engineering	Prof Stephan Heyns	012 420 2432 stephan.heyns@up.ac.za
	Anglo-American Chair in Pyrometallurgy	Prof Andrie Garbers-Craig	012 420 3189 andrie.garbers-craig@up.ac.za
	Bateman Chair in Minerals Processing	Dr Natasia Naudé	012 420 4208 natasia.naude@up.ac.za

	UP research and industry chairs	ndustry chairs	
Faculty	Name of chair	Chair	Contact details
Engineering, Built Environment and Information Technology	South African Institute of Welding (SAIW) Chair in Welding Engineering	Prof Madeleine du Toit	012 420 2187 madeleine.dutoit@up.ac.za
	Xstrata Chair in Modelling of Pyrometallurgical Processes	Dr Johan Zietsman	012 420 5919 johan.zietsman@up.ac.za
	Sasol Chair in Safety, Health and the Environment		
	Gijima AST Chair in Informatics	Dr Johan van Loggerenberg	012 420 3013 johan.vl@up.ac.za
	Chair in Electronic Defence Research (CEDR)	Prof Warren du Plessis	012 420 2951 wduplessis@up.ac.za
	CBI Electric Low Voltage Chair in Power Electronics		
	Rand Water Chair in Civil Engineering – Water Purification, Supply, Utilisation-related Science and Engineering	Prof Fanie van Vuuren	012 420 2438 fanie.vanvuuren@up.ac.za
	Rand Water Chair in Mechanical Engineering – Water Purification, Supply and Utilisation-related Science and Engineering	Prof Nico Theron	012 420 3309 nico.theron@up.ac.za
Health Sciences	Rand Water Chair in Water and Public Health	Prof Maureen Taylor	012 319 2358 maureen.taylor@up.ac.za
Humanities	Jean Monnet Chair in Regional Integration and Governance Studies	Prof Lorenzo Fioramonti	012 420 2696 lorenzo.fioramonti@up.ac.za
Law	SARChI Chair in International Development Law and African Economic Relations	Prof Frans Viljoen (interim)	012 420 3228 frans.viljoen@up.ac.za

	UP research and industry chairs	ndustry chairs	
Faculty	Name of chair	Chair	Contact details
Natural and Agricultural Sciences	Natural and Agricultural SARChi Chair in Statistics Sciences	Prof S Chakraborti	012 420 5055 schakrab@cba.ua.edu
	SARChI Chair in Mammal Behavioural, Ecology and Physiology	Prof Nigel Bennett	012 420 2538 nigel.bennet@up.ac.za
	SARChI Chair in Complex Systems	Prof Pavel Selyshchev	012 420 2455 pavel.selyshchev@up.ac.za
	SARChI Chair in Mathematical Models and Methods in Bioengineering and Biosciences	Prof Jean Lubuma	012 420 2520 jean.lubuma@up.ac.za
	SARChi Chair in Sustainable Malaria Control	Prof Lyn-Marie Birkholtz	012 420 2479 Iynmarie.birkholtz@up.ac.za
	Mondi Chair in Tree Pathology	Prof Mike Wingfield	012 420 3939 mike.wingfield@up.ac.za
	Sappi and Mondi Chair in Forest Genomics and Biotechnology	Prof Zander Myburg	012 420 4945 zander.myburg@up.ac.za
	SAFCOL Chair in Forestry	Prof Paxie Chirwa	012 420 3213 paxie.chirwa@up.ac.za
	Exxaro Kumba Chair in Geodynamics	Prof Wlady Altermann	012 420 4137 wlady.altermann@up.ac.za
	Aon Benfield Chair in Geology		
	Absa Chair in Agribusiness Management	Prof Andre Louw	012 420 5772 andre.louw@up.ac.za
	Rand Water Chair in Water Microbiology	Prof Fanus Venter	012 420 4100 fanus.venter@up.ac.za

	UP research and industry chairs	ndustry chairs	
Faculty	Name of chair	Chair	Contact details
Veterinary Sciences	Chair in Primary Animal Health Care (PAHC)	Prof Rebone Moerane	012 529 8464
			rebone.moerane@up.ac.za
	Research Chair in Poultry Health and Production Prof Celia Abolnik	Prof Celia Abolnik	012 529 8258
			celia.abolnik@up.ac.za

	Research entities at the University of Pretoria	Jniversity of Preto	oria
Faculty	Centres, institutes and units	Director	Contact details
Economic and Management Sciences	Centre for Inclusive Banking in Africa	Prof Gerhard Coetzee	012 420 5836 gerhard.coetzee@up.ac.za
	Centre for Communication Reputation Management	Prof Ronél Rensburg	012 420 3395 ronel.rensburg@up.ac.za
	Albert Luthuli Centre for Responsible Leadership	Prof Derick de Jongh	012 420 3386 derick.dejongh@up.ac.za
	African Tax Institute	Prof Riël Franzsen	012 420 5538 riel.franzsen@up.ac.za
	Unit for Forensic Accounting	Mr Danie du Plessis	012 420 3419 danie.duplessis@up.ac.za

	Research entities at the University of Pretoria	Jniversity of Preto	oria
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	Interuniversity Centre for Education Law and Education Policy	Prof Rika Joubert	012 420 5514 rika.joubert@up.ac.za
	Joint Centre for Mathematics, Science and Technology Education (JCMSTE) – joint with Natural and Agricultural Sciences	Prof Max Braun	012 420 5621 max.braun@up.ac.za
	Unit for Education Research in AIDS (ERA)	Prof Liesel Ebersöhn	012 420 2337 liesel.ebersohn@up.ac.za
	Unit for Distance Education	Dr Lizelle Sambane	012 420 5699 de.admin@up.ac.za
Engineering, Built Environment and	African Centre of Excellence in Information Ethics	Prof Theo Bothma	012 420 2293 theo.bothma@up.ac.za
Information Technology	Centre for Advanced Sensor Networks	Prof Gerhard Hancke	012 420 2386 gerhard.hancke@up.ac.za
	Centre for Electromagnetism	Prof Wimpie Odendaal	012 420 3545 wimpie.odendaal@up.ac.za
	Centre for Telecommunications Engineering for the Information Society (CeTEIS)	Mr Jacques van Wyk	012 420 2028 jacques.vanwyk@up.ac.za
	Centre of New Energy Systems (CNES)	Prof X Xia	012 420 2165 xxia@up.ac.za
	Centre of Excellence in Teletraffic Engineering	Prof L Linde	012 420 2168 louis.linde@up.ac.za
	Centre of Excellence in Pyrometallurgy	Prof Andrie Garbers-Craig	012 420 3189 andrie.garbers-craig@up.ac.za
	Kumba Iron Ore Mine Design Centre	Prof Ronny Webber-Youngman	012 420 3763 ronny.webber@up.ac.za

	Research entities at the University of Pretoria	Jniversity of Preto	oria
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Engineering, Built Environment and	Specialist Centre in Plant Asset Management	Prof Stephan Heyns	012 420 2432 stephan.heyns@up.ac.za
Information Technology	South African Institute for Welding (SAIW) Centre for Welding Engineering	Prof Madeleine du Toit	012 420 2187 madeleine.dutoit@up.ac.za
	Institute of Advanced Materials (jointly with Natural and Agricultural Sciences)	Prof Walter Focke	012 420 3728 walter.focke@up.ac.za
	Industrial Metals and Minerals Research Institute	Prof Roelf Sandenbergh	012 420 2440 roelf.sandenbergh@up.ac.za
	Institute for Technological Innovation	Prof Anastassios Pouris	012 420 5178 anastassios.pouris@up.ac.za
	Carl and Emily Fuchs Institute for Microelectronics Prof Sunil Maharaj (CEFIM)	Prof Sunil Maharaj	012 420 4636 sunil.maharaj@up.ac.za
	Eskom Power Plant Engineering Institute (EPPEI)	Prof Stephan Heyns	012 420 2432 stephan.heyns@up.ac.za
	Mining Resilience Research Institute (Anglo American, Sasol)	Prof Ronny Webber-Youngman	012 420 3763 ronny.webber@up.ac.za

	Research entities at the University of Pretoria	Jniversity of Preto	oria
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Health Sciences	Applied Morphology Research Centre	Prof Resia Pretorius	012 319 2907 resia.pretorius@up.ac.za
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	Forensic Anthropology Research Centre	Prof Maryna Steyn	012 420 3256 maryna.steyn@up.ac.za
	UP Centre for Sustainable Malaria Control	Prof Tiaan de Jager	012 354 2072 tiaan.dejager@up.ac.za
	Institute for Molecular and Cellular Biology	Prof Michael Pepper	012 319 2190 michael.pepper@up.ac.za
	Institute for Sport Research	Prof Ernst Kruger	012 420 6033 ernst.kruger@up.ac.za
	MRC Unit for Inflammation and Immunity	Prof Robert Pattinson	012 373 8041 robert.pattinson@up.ac.za
	MRC Unit for Maternal and Infant Health Care Strategies	Prof Ron Anderson	012 319 2425 ronald.anderson@up.ac.za
	Environmental Chemical Pollution and Health Research Unit	Dr Natalie Aneck-Hahn	012 354 1676 natalie.aneck-hahn@.up.ac.za
Humanities	Centre for Augmentative and Alternative Communication (CAAC)	Prof Juan Bornman	012 420 2001 juan.bornman@up.ac.za
	Centre for Mediation in Africa	Prof Laurie Nathan	012 420 2464 laurie.nathan@up.ac.za
	Centre for Research in Politics of Language (CentRePol)	Prof Vic Webb	012 420 2332 vic.webb@up.ac.za

	Research entities at the University of Pretoria	Jniversity of Preto	oria
Faculty	Centres, institutes and units	Director	Contact details
Humanities	Centre for the Study of Governance Innovation	Prof Lorenzo Fioramonti	012 420 2696 lorenzo.fioramonti@up.ac.za
	Institute for Strategic and Political Affairs	Prof Sandy E Africa	012 420 5182/2034 sandy.africa@up.ac.za
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	Unit for Academic Literacy	Prof Adelia Carstens	012 420 4957 adelia.carstens@up.ac.za
	Unit for Creative Writing	Prof Henning Pieterse	012 420 2334 henning.pieterse@up.ac.za
	UP Cochlear Impant Unit (UPCIU)	Prof Bart Vinck	012 420 2355 bart.vinck@up.ac.za
Law	Centre for Advanced Corporate and Insolvency Law	Prof André Boraine	012 420 2055 andre.boraine@up.ac.za
	Centre for Child Law	Prof Ann Skelton	012 420 4502 ann.skelton@up.ac.za
	Centre for Human Rights	Prof Adem Kassie Abebe	012 420 4306 adem.kassie@up.ac.za
	Centre for Intellectual Property Law	Prof Steve Cornelius	012 420 3158 steve.cornelius@up.ac.za
	Centre for Law and Medicine	Prof Pieter Carstens	012 420 2415 pieter.carstens@up.ac.za
	Sports Law Centre in Africa	Prof André Boraine	012 420 2055 andre.boraine@up.ac.za

	Research entities at the University of Pretoria	Jniversity of Preto	ıria
Faculty	Centres, institutes and units	Director	Contact details
Law	Institute for International and Comparative Law in Africa (ICLA)	Prof Erika de Wet (Co-director) Prof Christof Heyns (Co-director)	012 420 6217 erika.dewet@up.ac.za 012 420 4957 christof.hevns@up.ac.za
	International Development Law Unit (IDLU)	Prof Adem Kassie Abebe	012 420 4306 adem.kassie@up.ac.za
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	UP (Aon Benfield) Natural Hazard Centre Africa	Prof Andrzey Kijko	012 420 3613 andrzej.kijko@up.ac.za
	Centre for Environmental Economics and Politicy in Africa (CEEPA)	Prof Rashid Hassan	012 420 3893 rashid.hassan@up.ac.za
	Centre for Environmental Studies (CFES)	Prof Willem Ferguson	012 420 2017 willemferguson@zoology.up.ac. za
	Centre for Geoinformation Sciences (CGIS)	Dr Serena Coetzee	012 420 3823 serena.coetzee@up.ac.za
	Centre for Microbial Ecology and Genomics (CMEG)	Prof Don Cowan	012 420 5873 don.cowan@up.ac.za
	Centre for Wildlife Management	Prof Michael Somers	012 420 6091 michael.somers@up.ac.za
	Joint Centre for Mathematics, Science and Technology Education (JCMSTE) – joint with Education	Prof Max Braun	012 420 5621 max.braun@up.ac.za
	SADC Centre for Land-related Regional and Development Policy	Prof Nic Olivier	012 420 5044 nic.olivier@up.ac.za
	DST/NRF Centre for Tree Health Biotechnology	Prof Mike Wingfield	012 420 3939 mike.wingfield@up.ac.za

	Research entities at the University of Pretoria	Iniversity of Preto	ıria
Faculty	Centres, institutes and units	Director	Contact details
Natural and Agricultural Sciences	Forestry and Agricultural Biotechnology Institute (FABI)	Prof Mike Wingfield	012 420 3938 mike.wingfield@fabi.up.ac.za
	Institute of Applied Materials (jointly with Engineering, Built Environment and Information Technology)	Prof Walter Focke	012 420 3728 walter.focke@up.ac.za
	Institute for Food, Nutrition and Wellbeing (IFNUW)	Prof Sheryl Hendriks	012 420 3811 sheryl.hendriks@up.ac.za
	Mammal Research Institute (MRI)	Prof Bob Millar	012 420 3776 robertpetermillar@gmail.com
	UP Water Institute	Prof Hannes Rautenbach	012 420 2173 hannes.rautenbach@up.ac.za
	Genomics Research Institute	Prof Don Cowan	012 420 5873 don.cowan@up.ac.za
	Bioinformatics and Computational Biology Unit	Prof Fourie Joubert	012 420 3613 fourie.joubert@up.ac.za
	Conservation Ecology Research Unit (CERU)	Prof Rudi van Aarde	012 420 2753 rjvaarde@zoology.up.ac.za
	STATOMET (Bureau for Statistical and Survey Methodology)	Prof Andriëtte Bekker	012 420 2553 andriette.bekker@up.ac.za
	Biomath Forum	Prof Jean Lubuma	012 420 2520 jean.lubuma@up.ac.za
	Experimental Farms	Prof Edward Webb	012 420 3271 edward.webb@up.ac.za
	Laboratory for Microscopy and Microanalysis	Mr André Botha	012 420 2075 ajbotha@scientia.up.ac.za
	Postgraduate School of Agriculture and Rural Development	Prof Charles Machethe	012 420 3280 charles.machethe@up.ac.za
	Sci-Enza	Ms Rudi Horak	012 420 2865 rudi.horak@up.ac.za

	Research entities at the University of Pretoria	Jniversity of Preto	ıria
Faculty	Centres, institutes and units	Director	Contact details
Theology	Centre for Contextual Ministry (CCM)	Dr Stephan de Beer	012 420 4951 stephan.debeer@up.ac.za
	Centre for Public Theology	Dr Vuyani Vellem	012 420 6518 vuyani.vellem@up.ac.za
	Excelsus (Dutch Reformed Church:Centre for Continuing Ministerial Development)	Dr André Bartlett	012 420 4441 andre.bartlett@up.ac.za
	Institute for Missiological and Ecumenical Researdh (ISWEN)	Dr Attie van Niekerk	012 420 2780 attie.vanniekerk@up.ac.za
	NOVA – Institute for Research and Development for Prevention of Poverty	Dr Attie van Niekerk	012 420 2780 attie.vanniekerk@up.ac.za
Veterinary Sciences	Centre for Veterinary Wildlife Studies	Dr Richard Burroughs	012 529 8508 richard.burroughs@up.ac.za
	Equine Research Centre	Prof Alan Guthrie	012 529 8068 alan.guthrie@up.ac.za
	UP Biomedical Research Centre	Prof Vinny Naidoo	012 529 8082 vinny.naidoo@up.ac.za
	Onderstepoort Veterinary Genetics Laboratory	Dr Cindy Harper	012 529 8450 cindy.harper@up.ac.za



Faculty of Economic and Management Sciences

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Visit the website at www.up.ac.za.

The Faculty of Economic and Management Sciences is the largest at the University of Pretoria in terms of student numbers. It comprises nine departments specialising in financial sciences, economic sciences, management sciences and public management, and offers 90 postgraduate programmes. The departments are as follows:

- Accounting
- Auditing
- Business Management (including the Communication Management Division)
- Economics
- Financial Management
- Human Resource Management
- Marketing Management (including the Tourism Management Division)
- School of Public Management and Administration
- Taxation



Faculty of Education

Dean: Prof Irma Eloff

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Faculty postgraduate contact

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Visit the website at www.up.ac.za.

The Faculty of Education is one of the largest and most diverse facilities in South Africa for the initial and advanced training of education professionals from across the world. The faculty has five departments:

- **Humanities Education**
- Science, Mathematics and **Technology Education**
- **Education Management and Policy** Studies
- **Educational Psychology**
- Early Childhood Education

The University of Pretoria is the place of the leading scientists of the future. At UP, the main focus is on developing the students' skills and helping them discover their weaknesses and turn them into strengths. Since I started at UP three years ago, my views for the future have changed and I am now empowered to be a person who's willing to change the world. At the end, I just want to add that UP is a home away from home.







Faculty of Engineering, Built Environment and Information Technology





Faculty postgraduate contact

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The Faculty of Engineering, Built Environment and Information Technology is divided into three schools. The faculty is also home to the Graduate School of Technology Management and has various institutes and research centres. All the research within the Faculty is aligned with the strategic imperatives and industry. The schools and departments are as follows:

School of Engineering

- Department of Chemical Engineering
- Department of Civil and Biosystems Engineering
- Department of Electrical, Electronic and **Computer Engineering**
- Department of Industrial and Systems Engineering
- Department of Materials Science and Metallurgical Engineering
- Department of Mechanical and Aeronautical Engineering
- Department of Mining Engineering

School for the Built Environment

- Department of Architecture
- Department of Construction Economics
- Department of Town and Regional **Planning**

School of Information Technology

- Department of Computer Science
- Department of Informatics
- Department of Information Science
- Graduate School of Technology Management









Faculty of Humanities

Dean: Prof Vasudhevan Reddy

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Faculty postgraduate contact

Tracey Andrew

Tel: +27 12 420 4850

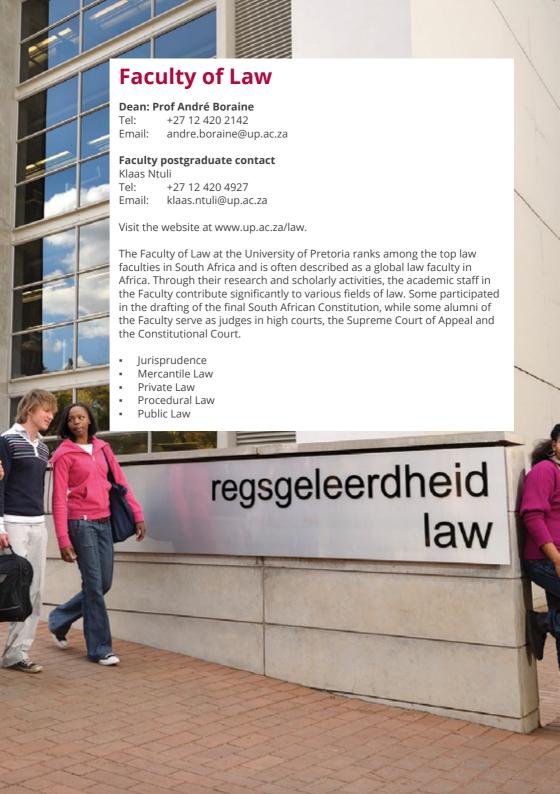
Fmail: tracey.andrew@up.ac.za

Visit the website at www.up.ac.za.

The Faculty of Humanities is one of the most comprehensive humanities faculties in the country, with 17 different academic departments and two teaching units:

- Department of African Languages
- Department of Afrikaans
- Department of Ancient Languages
- Department of Anthropology and Archaeology
- Department of Speech-Language Pathology and Audiology
- Department of Drama
- Department of English
- Department of Historical and Heritage Studies
- Department of Modern European Languages
- Department of Music
- Department of Philosophy
- Department of Political Sciences
- Department of Psychology
- Department of Social Work and Criminology
- Department of Sociology
- Department of Sport and Leisure Studies
- Department of Visual Arts

I completed my MMus (Performance) at the University of Pretoria. The experience changed my life and enriched my practical work as voice lecturer and my research and presentation of Voice Method. I have received a bursary from UP to complete my postgraduate studies. During my research, I have established valuable contacts and networking channels with expert colleagues in Canada and the USA. This was made possible by the generosity of UP (upon recommendation of my Head of Department, Prof Wim Viljoen), which sponsored my trip to read a paper on my research in Vocal Pedagogy and presenting a lecture recital on South African indigenous art and folk music at an international singing symposium in Newfoundland in 2011. My gratitude and appreciation go to all persons at UP who assisted me with my postgraduate studies.



Faculty of Natural and Agricultural Sciences

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The Faculty of Natural and Agricultural Sciences prides itself in producing highly skilled graduates and generating new scientific knowledge through worldclass research. Some 40% of all rated researchers, as well as A-rated researchers at the University of Pretoria, are members of this faculty, an indicator that the academic staff are at the forefront of their respective disciplines.

The departments within the Faculty are as follows:

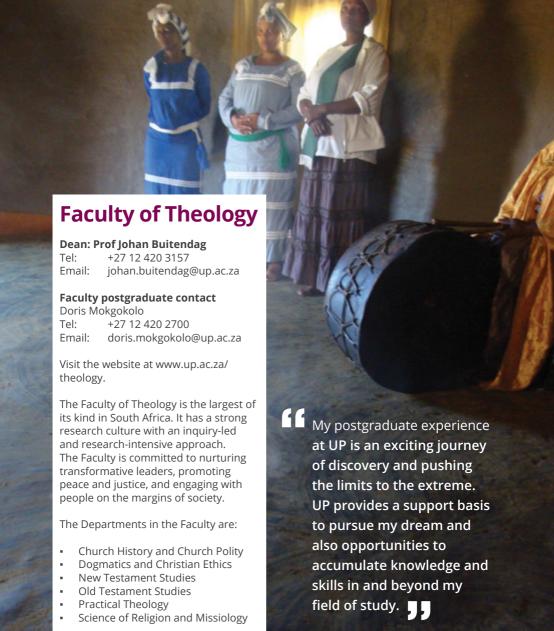
- Agricultural Economics, Extension and Rural Development
- Anatomy
- Animal and Wildlife Science
- Biochemistry
- Chemistry
- Consumer Science
- Food Science
- Genetics
- Geography, Geoinformatics and Meteorology
- Insurance and Actuarial Science
- Mathematics and Applied Mathematics
- Microbiology and Plant Pathology
- Physiology
- Physics
- Plant Production and Soil Science
- Plant Science
- Statistics
- Zoology and Entomology











Faculty of Veterinary Science

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The Faculty of Veterinary Science at Onderstepoort is the only one of its kind in South Africa and the second oldest of the 46 such faculties in Africa. An onlinebased MSc in Veterinary Tropical Diseases is offered by the Faculty and attracts a range of national and international postgraduate students.

The Faculty has five academic departments:

- Anatomy and Physiology
- Companion Animal Clinical Studies
- Paraclinical Sciences
- Production Animal Studies
- Veterinary Tropical Diseases



The Graduate Support Hub @ UP

The Graduate Support Hub is a support-oriented virtual and physical space that serves as a central hub to facilitate and coordinate the functions and processes that impact on postgraduate students and postdoctoral fellows of the University. The Graduate Support Hub is part of the Department of Research and Innovation Support and works in close cooperation with the Client Service Centre, faculty administration offices, Study Finance and the International Students Division. It coordinates postgraduate and postdoctoral processes, provides academic research support and is committed to the provision of broad-based skills developmental activities.

Postgraduate resources

The Research Commons is a dedicated advanced space for postgraduate students at master's and doctoral level, as well as researchers and academic staff at the University of Pretoria. It combines research and social space that contributes to social dialogue, scholarly exchange and intellectual development. The space includes work stations, study carrels, seminar and group discussion rooms equipped with top-end PCs, WiFi connectivity, printers, scanners and copiers. A separate lounge area is available for relaxation.

Funding your postgraduate studies

Various bursaries, scholarships and fellowships are available through a number of agencies and within the University of Pretoria. The Client Service Centre (CSC) (www.up.ac.za) will assist with all the administrative processes linked to bursary applications. In addition, the Graduate Support Hub offers assistance with funding applications. A list of funding opportunities for which students can apply is regularly updated on the University website, www.up.ac.za/feesfunding, as well as the Graduate Support @ UP Facebook page.

Unique experience, had a great opportunity to contribute to the science body of knowledge through unparalleled research at UP during my MSc study. This set me up for my current doctoral research on innovative anthrax vaccinology/ immunological responses in selected species.



University of Pretoria

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