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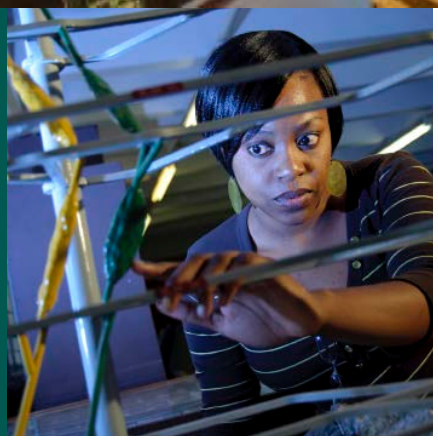
Engineering, Built Environment and Information Technology

Undergraduate faculty brochure



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www.up.ac.za

Message from the Dean

If you want to make a constructive difference to the world, then the Faculty of Engineering, Built Environment and Information Technology (EBIT) at the University of Pretoria (UP) must be your choice for further study. If one looks at the top 100 occupations in high demand in South Africa, seven out of the top ten are based on study programmes presented by this faculty. So this is the place to be!

The Faculty is a highly sought-after source of graduates in engineering, the built environment and information technology. Extensive and cutting-edge teaching, learning and laboratory facilities are integrated into the excellent campus-wide suite of facilities and services offered by the University. Access to its study programmes is expanded through extended supporting study programmes. The Faculty expects total commitment from its students with regard to individual and group work to shape them as future leaders. You are invited to consider enrolling in one of the study programmes in this Faculty if you share our vision of excellence and want to position yourself as a leader in the professions supported in the Faculty.

The Faculty is organised into four schools: the School of Engineering, the School for the Built Environment, the School of Information Technology and the Graduate School of Technology Management.

The School of Engineering at UP is the largest school of its kind in South Africa in terms of student numbers, graduates and research contributions. Programmes in all the major engineering disciplines are presented, with many specialisations offered at undergraduate and postgraduate level. According to the Thomson Reuters Essential Science Indicators for citations, the School of Engineering is ranked in the top 1% of engineering schools in the world. The School for the Built Environment also offers the entire spectrum of programmes in the built environment, with studio-based education in the architectural degrees, and close ties and alignment with the building industry. The School of Information Technology is unique and one of the forerunners in South Africa, where students have the advantage of an integrated approach to information technology (IT), with study programmes and modern laboratories in computer science, informatics and information science.

Through various advisory boards, the Faculty has established a strong partnership with the industries it supports. This enables the University of Pretoria to be internationally competitive, while also remaining locally relevant. Where applicable and available, its study programmes are accredited by statutory and professional bodies at national and international level. The Faculty strives to accommodate students that meet its admission criteria, and we recommend that learners excel in their studies and apply early, as places are limited. If you have limited financial means, but are an achiever, you can still apply. The University has various financial schemes to assist deserving students with bursaries and loans.

Thank you for considering our degree offerings. We look forward to your application to join one of our study programmes and trust that you will have an enriching and rewarding experience that will build a lifelong affiliation with the Faculty.

Prof Sunil Maharaj
Dean: Faculty of Engineering, Built Environment and Information Technology

Content

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Comments and queries can be directed to csc@up.ac.za or tel: +27 (0)12 420 311.

Undergraduate study programmes

Important information on undergraduate study programmes for 2016

• In order to register NSC/IEB/Cambridge candidates must comply with the minimum requirements for degree studies as well as with the minimum requirements for the relevant study programme. • Life Orientation is excluded when calculating the APS. • Grade 11 results are used in the provisional admission of prospective students. • A valid National Senior Certificate (NSC) with admission to degree studies is required. • Minimum subject and achievement requirements, as set out below, are required. On first-year level a student has a choice between Afrikaans and English as language medium. In certain cases, tuition may be presented in English only, for example in electives, where the lecturer may not speak Afrikaans or in cases where it is not economically or practically viable. • Provisional admission to the four-year programme in the School of Engineering is only guaranteed if a prospective student complies with ALL the requirements below.
Note: Candidates who do not comply with the minimum requirements, set out above, but who have obtained a minimum APS of 30, an achievement level of 5 for English or Afrikaans, 6 for Mathematics and 5 for Physical Science, will be considered for provisional admission to either the four-year programme or the ENGAGE programme based on the results of the compulsory NBT.
• Admission to ENGAGE in the School of Engineering will be determined by the results of the NBT, NSC results, an achievement level of 5 in Mathematics and 4 in Physical Science, as well as an achievement level of 4 in Afrikaans or English, together with an APS of 25. • Students may apply directly to be considered for the ENGAGE programme.

University of Pretoria website www.up.ac.za
National Benchmark Test website www.nbt.ac.za

Study programme **Duration** **Closing dates** **Careers**	**Minimum requirements for 2016**												
	Achievement level												**APS**
SCHOOL OF ENGINEERING	**Afrikaans or English**				**Mathematics**				**Physical Science**				
	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	
BEng (Industrial Engineering) **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	6	2	B	B*	6	2	B	B*	**35**
Careers: Industrial engineers design, test, implement and manage a wide range of man/machine systems for the delivery of production and services. Organisational matters that require optimisation include site selection and layout of facilities, manufacturing, inventory control, materials handling, supply chain management, quality management, cost control, financial services, maintenance, reliability, computer simulation, information systems, human resources and business law.													
BEng (Chemical Engineering) **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	6	2	B	B*	6	2	B	B*	**35**
Careers: Chemical engineers are involved in industrial processes that convert raw materials into products with a higher economic value. This is achieved by means of physical, thermal, chemical, biochemical and mechanical changes and processes. Chemical engineers apply their specialised knowledge in the petroleum, food, minerals processing, power generation, and the paper and pulp industries, water and effluent treatment, as well as environmental engineering activities, including air pollution control. Like other engineering disciplines, chemical engineers are involved in research and development, techno-economic evaluation, equipment and plant design, process control and optimisation, construction, commissioning, operation and management and final product marketing and distribution.												
BEng (Civil Engineering) **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	6	2	B	B*	6	2	B	B*	**35**
Careers: Civil engineers design, build and maintain constructions such as tower blocks and skyscrapers, dams, canals and pipelines, roads, bridges, tunnels, railways, airports, power stations, television towers, water works and outfall installations. They are involved in financial modelling, feasibility studies and the management and rehabilitation of large asset portfolios.													
BEng (Electrical Engineering) **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	6	2	B	B*	6	2	B	B*	**35**
Careers: Electrical engineers are active in the generation, storage, transmission, distribution and utilisation of electrical energy. There is a brilliant future in renewable energy. Electrical engineers design, supervise the construction, oversee the optimal operation and assure perfect and timely maintenance of all electrical installations for municipalities, residential areas, commercial buildings, factories, mines and industries. Rail transport, water pumping, electrical grids, telecommunications, energy management and smart lighting are all fields of application of electrical engineering.													

*A-Level: C symbols for Mathematics, Physics and Chemistry will be considered for admission providing the required APS has been obtained.

Undergraduate study programmes

Study programme Duration Closing dates Careers	Minimum requirements for 2016												
	Achievement level												APS
SCHOOL OF ENGINEERING	Afrikaans or English				Mathematics				Physical Science				
	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	
BEng (Electronic Engineering) **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	6	2	B	B*	6	2	B	B*	**35**
Careers: Electronic engineers are active in various fields, such as telecommunications (fixed networks, wireless, satellite, television, radar and radio frequency networks), entertainment and medical (magnetic resonance imaging, X-rays, cardiopulmonary resuscitation, infrared tomography, electroencephalograms (EEG), electrocardiograms (ECG), rehabilitation engineering and biokinetics), integrated circuit design, bioengineering, military (vehicle electronics, smart bombs, night vision, laser systems), transport (e-tags, speed measuring, railway signalling, global positioning system (GPS) and mapping), "smart" dust, safety and security systems (face and speech recognition), banking (ATMs), commerce, robotics, education, environmental management, tourism and many more.												
BEng (Mechanical Engineering) **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	6	2	B	B*	6	2	B	B*	**35**
Careers: Mechanical and aeronautical engineers are concerned with power-generating machines and systems such as vehicles, ships, air-conditioners, pebble bed nuclear reactors, aeroplanes, engines and turbines, robots and biomedical systems. Areas of specialisation include product design and manufacturing (such as design, testing and improvement of mechanical, electrical, pneumatic and hydraulic systems), marine engineering and naval architecture, biomedical engineering, air-conditioning and refrigeration, aerospace systems and aircraft/missile engineering, vehicle engineering, maintenance engineering and energy management (gas and steam turbines, nuclear power reactors, petrol engines, cooling towers and renewable energy systems).												
BEng (Metallurgical Engineering) **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	6	2	B	B*	6	2	B	B*	**35**
Only presented in English from second year **Careers:** Metallurgical engineers unlock the riches of deposits of metal ores, coal and diamonds and optimise the manufacture of metal components. They work in plants where valuable minerals are recovered from ore, where metals are produced out of the minerals and where the metals are converted into useful materials – such as steel or aluminium. Careers include production engineers, plant managers, consultants and researchers.													
BEng (Mining Engineering) **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	6	2	B	B*	6	2	B	B*	**35**
Only presented in English **Careers:** Mining engineers have a wide range of opportunities, namely mining (mine management, technical management of ventilation, rock mechanics, rock breaking, mineral resources), financial evaluation and management (mine design, mine financial evaluation, mine feasibility studies, mine environmental impact studies), mining and drilling contracting (mining, tunnelling, shaft sinking, mine development, ore evaluation), mining research, mining equipment design and manufacture, mining marketing and mining administration at national, provincial or international level.													
BEng (Computer Engineering) **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	6	2	B	B*	6	2	B	B*	**35**
Careers: Computer engineers are active in all fields of the information superhighway and the information and communication technology (ICT) world, which include computer systems, software engineering, computer and communications networks, wireless sensor networks, embedded software, electronics, smart control systems and automation, data security, e-commerce, pattern recognition (face and speech recognition), and artificial intelligence. They specialise in combining hardware, software and communication technologies to optimise system performance.													
Engineering Augmented Degree Programme (ENGAGE) **[5 years]** Candidates who do not comply with the minimum requirements mentioned above, but who do comply with these requirements, must write the NBT.	4	3	D	D	5	3	C	C	4	3	D	D	**25**

*A-Level: C symbols for Mathematics, Physics and Chemistry will be considered for admission providing the required APS has been obtained.

Undergraduate study programmes

Study programme **Duration** **Closing dates** **Careers**	**Minimum requirements for 2016**												
	Achievement level												**APS**
SCHOOL FOR THE BUILT ENVIRONMENT	**Afrikaans or English**				**Mathematics**				**Physical Science**				
	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	
BScArch – BSc Architecture **[3 years]** Closing dates: SA – 30 June Non-SA – 30 June	5	3	C	C	4	3	D	D	4	3	D	D	**27**
Will only be considered as first study choice Selection programme: Selection includes an interview. **Careers:** The BSc Architecture study programme enables graduates to register with the South African Council for the Architectural Profession (SACAP) as candidate architectural technologists. The qualification is the first step to future registration as a candidate senior architectural technologist or a candidate architect. In practice, technologists and/or junior designers provide assistance in the disciplines of architecture and urban design. Their responsibilities include design development, documentation of projects, project administration and site management.													
BScInt – BSc Interior Architecture **[3 years]** Closing dates: SA – 30 June Non-SA – 30 June	5	3	C	C	4	3	D	D	4	3	D	D	**27**
Will only be considered as first study choice Selection programme: Selection includes an interview. **Careers:** The BSc Interior Architecture study programme enables graduates to register with the South African Institute for the Interior Design Professions (IID) as candidate interior designers. This qualification is the first step to future registration as a candidate senior interior designer or a candidate interior architect. In practice, candidate designers provide assistance in the disciplines of interior design and architecture. Their responsibilities include design development, the documentation of projects, project administration and site management. Graduates work as designers in the built environment and related fields such as exhibition, lighting, product and stage design.													
BScLArch – BSc Landscape Architecture **[3 years]** Closing dates: SA – 30 June Non-SA – 30 June	5	3	C	C	4	3	D	D	or Geography or Life Sciences 4	or Geography or Life Sciences 3	or Geography or Life Sciences D	or Geography or Life Sciences D	**27**
Selection programme: Selection includes an interview. **Careers:** The BSc Landscape Architecture study programme enables graduates to register with the South African Council for the Landscape Architectural Profession (SACLAP) as candidate landscape architectural technologists. This qualification is the first step to future registration as a candidate landscape architect. In practice, technologists and/or junior designers provide assistance in the disciplines of landscape architecture, environmental planning and management, architecture and urban design. Their responsibilities include design development, the creation of assessments and reports, the documentation of projects, project administration and site management.													
BSc Construction Management **[3 years]** Closing dates: SA – 30 June Non-SA – 30 June	5	3	C	C	5	3	C	C	or Accounting 4	or Accounting 3	or Accounting D	or Accounting D	**30**
Selection programme **Careers:** After completing the three-year undergraduate study programme, graduates could enter careers, in among others, construction site management or subcontract work. On completion of the ensuing two-year honours programme, graduates are able to register as professional construction managers and opportunities become much wider, including project management, property development, portfolio management, commercial marketing and managerial positions in the corporate environment.													
BSc Real Estate **[3 years]** Closing dates: SA – 30 June Non-SA – 30 June	5	3	C	C	5	3	C	C	or Accounting 4	or Accounting 3	or Accounting D	or Accounting D	**30**
Selection programme **Careers:** Apart from a future in areas such as property investment, property finance and facilities and property management, further studies to obtain an honours degree in real estate can lead to registration as professional property valuers. Career opportunities encompass the whole spectrum of the property sector, whether as entrepreneurs in the private sector or as employees in the private, government or semi-government sectors.													
BScQS – BSc Quantity Surveying **[3 years]** Closing dates: SA – 30 June Non-SA – 30 June	5	3	C	C	5	3	C	C	or Accounting 4	or Accounting 3	or Accounting D	or Accounting D	**30**
Selection programme **Careers:** Quantity surveying is the science that delivers specialised financial and contractual services and advice to clients in the building and construction industry, as well as related industries. The three year undergraduate degree is the first step towards registration as quantity surveyors. The ensuing two-year honours programme leads to registration as candidate professional quantity surveyors. Career opportunities, apart from those in the private, government or semi-government sectors, also exist in the property, banking, mining and manufacturing industries.													

Undergraduate study programmes

Study programme Duration Closing dates Careers	Minimum requirements for 2016												
	Achievement level												APS
SCHOOL FOR THE BUILT ENVIRONMENT	Afrikaans or English				Mathematics				Physical Science				
	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	
BT&RP – Bachelor of Town and Regional Planning **[4 years]** Closing dates: SA – 30 June Non-SA – 30 June	5	3	C	C	4	3	D	D	-				**27**
Selection programme **Careers:** Town and regional planners, development practitioners, urban managers, real estate analysts and researchers. While most town and regional planners act as private consultants to the public and private sector, they are also employed by all three spheres of government, research agencies such as the Council for Scientific and Industrial Research (CSIR) and the Human Sciences Research Council (HSRC), non-governmental organisations, community-based organisations, major financial institutions and property development groups. The qualification will enable graduates to register as professional town and regional planners with the South African Council for Planners.													

Study programme Duration Closing dates Careers	Minimum requirements for 2016								
	Achievement level								APS
SCHOOL OF INFORMATION TECHNOLOGY	Afrikaans or English				Mathematics				
	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	
BIT – Bachelor of Information Technology **[4 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	5	3	C	C	**30 (26–29 admission based on the NBT)**
Should a candidate obtain an APS of 26 to 29, consideration for admission will be based on the results of the NBT, provided the quotas regarding student numbers have not been reached. **Careers:** Information technologists, programmers, system analysts, computer consultants, and buyers of hardware and software. This study programme provides knowledge and understanding of the theory and practice of programming and software engineering; theory and the practice of the adoption and use of information systems in business organisations; aspects of collecting, retrieving, organising, managing and using information; philosophy, language and mathematics.									
BSc (Computer Science) **[3 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	5	3	C	C	**30 (26–29 admission based on the NBT)**
Should a candidate obtain an APS of 26 to 29, consideration for admission will be based on the results of the NBT, provided the quotas regarding student numbers have not been reached. **Careers:** Programmers, systems analysts, systems architects, consultants, database administrators, network analysts and researchers.									
BIS (Multimedia) **[3 years]** Closing dates: SA – 30 September Non-SA – 31 August	4	3	D	D	5	3	C	C	**30 (26–29 admission based on the NBT)**
Should a candidate obtain an APS of 26 to 29, consideration for admission will be based on the results of the NBT, provided the quotas regarding student numbers have not been reached. **Careers:** Programmers, web designers, animation specialists, video editors, electronic artists. The study programme prepares candidates for positions at any of the following content producers: paper publications, television, radio, phone technologies and the web. Graduates can become coders and work for programming companies. They can develop skills in their particular areas of interest, such as digital music or video, programming; graphic, games or web development.									
BSc IT (Information and Knowledge Systems) **[3 years]** Closing dates: SA – 30 September Non-SA – 31 August	4	3	D	D	5	3	C	C	**30 (26–29 admission based on the NBT)**
Should a candidate obtain an APS of 26 to 29, consideration for admission will be based on the results of the NBT, provided the quotas regarding student numbers have not been reached. **Careers:** Graduates will differentiate themselves in an application environment by choosing one of the following subjects: Applied Mathematics, Genetics, Geographical Information Systems, IT and Enterprises, IT and Law, IT and Music, Operational Research, Philosophy, Psychology or Software Development.									
BIS (Information Science) **[3 years]** Closing dates: SA – 30 September Non-SA – 31 August	4	3	D	D	-				**28 (25–27 admission based on the NBT)**
Should a candidate obtain an APS of 25 to 27, consideration for admission will be based on the results of the NBT, provided the quotas regarding student numbers have not been reached. If informatics is selected at first-year level, an achievement level of 5 is required in Mathematics. **Careers:** Information and knowledge managers (manage information and knowledge resources), information or e-commerce specialists (organise, retrieve and add value to information), consultants on information products (services and systems), information brokers (act as infopreneurs and buy and sell information products and services), and system specialists/analysts/technologists (develop information systems).									

Undergraduate study programmes

Study programme Duration Closing dates Careers	Minimum requirements for 2016								
	Achievement level								APS
SCHOOL OF INFORMATION TECHNOLOGY	Afrikaans or English				Mathematics				
	NSC/ IEB	HIGCSE	AS-Level	A-Level	NSC/ IEB	HIGCSE	AS-Level	A-Level	
BIS (Publishing) **[3 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	-				**28 (25–27 admission based on the NBT)**
Should a candidate obtain an APS of 25 to 27, consideration for admission will be based on the results of the NBT, provided the quotas regarding student numbers have not been reached. **Careers:** Entry-level job opportunities include assisting specific role-players in the publishing value chain (such as MDs of publishing houses, commissioning editors, editors, and production or marketing managers), market or picture research, copyright negotiations, copy-editing and proofreading, marketing and promotion, distribution and delivery.									
BCom (Informatics) **[3 years]** Closing dates: SA – 30 September Non-SA – 31 August	5	3	C	C	5	3	C	C	**30**
This study programme is administered by the Faculty of Economic and Management Sciences.									

I completed my BEng (Civil Engineering) degree with distinction in 2013. The Civil Engineering Department provides students with the privilege to study under some of the world's best lecturers. They are not only experts in their fields, but also inspire one with their enthusiasm and broad knowledge. The course included some very memorable hands-on experiences, such as the workshop practice at the end of the first year, destructive steel tower testing and concrete cube crushing competitions.

I had been awarded a bursary from AECOM (then BKS) since my second year of study, and was exposed to various major projects during vacation work. It was during this time that I discovered my passion for water engineering and also when I realised that the most rewarding aspect of civil engineering is to see the physical development of the projects in which one is involved.

I was awarded the prizes for the top second-year civil engineering student, top Pavement Materials and Design student and for the best final-year water project. At the moment, I work as a candidate engineer at AECOM's Water Sector and I am enjoying every moment of it. I aspire to become a renowned dam and water resources engineer to assist in the development of the much-needed water infrastructure in South Africa and the rest of the world.

Jaretha Lombaard

Faculty highlights

The Faculty is organised in four Schools: the School of Engineering, the School for the Built Environment, the School of Information Technology and the Graduate School of Technology Management.

SCHOOL OF ENGINEERING

Programmes within the School of Engineering have all been granted accreditation by the Engineering Council of South Africa. The School is one of the largest of its kind in the country in terms of student numbers, graduates and research contributions and offers programmes in all the major engineering disciplines, with many specialisations also offered at undergraduate and graduate level.

Through its innovative and relevant research across seven departments, the University of Pretoria provides its students with the necessary training to make a considerable contribution to engineering in South Africa and abroad. The departments are: Chemical Engineering; Civil Engineering; Electrical, Electronic and Computer Engineering; Industrial and Systems Engineering; Materials Science and Metallurgical Engineering; Mechanical and Aeronautical Engineering, and Mining Engineering.

A flagship research project in the School of Engineering is INSiAVA (injection-enhanced silicon in avalanche), which is well on its way to finding a usable solution for the chip-to-chip interconnect problem experienced in the computer industry. INSiAVA (Pty) Ltd was established as the commercialisation vehicle for this silicon electroluminescent technology to generate light from an electrical current. The company has filed a suite of patents for more than 15 different inventions, all of which are vital breakthroughs in the process to finding a workable solution for this problem.

The School has close ties with industry through a number of research chairs across all departments. These include chairs in Maintenance Engineering, Pyrometallurgy, Fluoro-material Science and Process Integration, Carbon Technology and Materials, Reaction Engineering, Tribology and Environmental Engineering, Railway Engineering and Broadband Multimedia Communications. It also has a number of research centres, such as the Hub for Energy Efficiency and Demand-side Management, the Advanced Engineering Centre of Excellence, the Industrial Metals and Minerals Research Institute, the Centre for Telecommunications Engineering for the Information Society and the Carl and Emily Fuchs Institute for Microelectronics to name but a few. Each department excels in its own research, but the consolidation of research activities is encouraged and several sustainable research groups have been formed to make an impact world-wide.

Faculty highlights

SCHOOL FOR THE BUILT ENVIRONMENT

The School for the Built Environment also offers the entire spectrum of programmes in the built environment, with studio-based education in the architectural degrees, and close ties and alignment with the building industry.

The Department of Architecture is one of only a few institutions world-wide that has crosscutting programmes in the three disciplines of architecture, landscape architecture and interior design. BScArch, BArchHons and MArch(Prof) qualifications enable graduates to register with the South African Council for the Architectural Profession (SACAP) as candidate architectural technologists, senior architectural technologists and architects respectively.

The programme in architecture is validated by the South African Council for the Architectural Profession (SACAP) and recognised by the Commonwealth Association of Architects (CAA). The BScInt, BIntHons and MInt(Prof) qualifications enable graduates to have recognition from the South African Institute for the Interior Design Professions (IID).

The programme in interior architecture is one of only four similar programmes in South Africa with educational membership at the International Federation of Interior Architects and Designers (IFI). The Department was instrumental in the recent establishment of professional nomination in terms of the National Qualifications Framework Act (Act 67 of 2008) which will allow graduates to have recognition as candidate interior designers, senior interior designers and interior architects respectively. The BScLArch, BLHons and ML(Prof) qualifications enable graduates to register with the South African Council for the Landscape Architectural Profession (SACLAP) as candidate landscape architectural technologists, senior landscape technologists and landscape architects respectively. The study programme in landscape architecture is the only undergraduate degree of its kind offered at a university in South Africa and is validated by the South African Council for the Landscape Architectural Profession (SACLAP) and recognised by the International Federation of Landscape Architects (IFLA). The Department also offers honours, master's and doctoral degrees in research, as well as honours, master's and doctoral degrees in applied sciences.

The BSc (Quantity Surveying) study programme is accredited internationally by the Royal Institution of Chartered Surveyors (RICS) and the SA Council for the Quantity Surveying Profession (SACQSP), the BSc (Construction Management) study programme is accredited internationally by the South African Council for Project and Construction Management Professionals (SACPCMP) and the Royal Institution of Chartered Surveyors (RICS) and the MSc (Real Estate) study programme is accredited internationally by the Royal Institution of Chartered Surveyors (RICS) and the South African Council for the Property Valuers Profession (SACPVP). Graduates who have obtained a BScHons in Quantity Surveying may, after submitting proof of prescribed professional practical experience and successful completion of an assessment of professional competence, register with the South African Council for the Quantity Surveying Profession.

An honours degree in Real Estate can lead to registration as a professional property valuer. The property sector forms an appreciable part of the South African economy – in fact, real estate comprises about 40% to 50% of the world's total assets. Graduates with a Bachelor of Town and Regional Planning can register as professional town and regional planners with the South African Council for Town and Regional Planners, which is an official body established in terms of an act of Parliament. The degree is internationally recognised.

SCHOOL OF INFORMATION TECHNOLOGY

The School of Information Technology (SIT) is unique and the first of its kind in South Africa where students have the advantage of an integrated approach to information technology (IT) with study programmes and modern laboratories in Computer Science, Informatics and Information Science. The School offers cross-disciplinary degrees such as MIT and PhD(IT) and each of the departments also has its own selection of undergraduate and postgraduate degrees. Nine undergraduate degrees are offered in the SIT covering the entire spectrum of disciplines associated with information technology. All the degree offerings in the SIT are highly sought after in the IT industry with a focus on industry-related trends. The curriculum conforms to the highest international standards and provides breadth and depth in computing skills; equips students with problem-solving abilities; and gives them a foundation for continued learning in an IT career and for producing high-quality software. The BCom (Informatics) degree is the only degree in Africa that is internationally accredited by the Accreditation Board for Engineering and Technology (ABET) of the USA. The Department of Information Science at the University of Pretoria, with funding from the Carnegie Corporation of New York, offers a fully funded specialised two year coursework degree at master's level in information technology (MIT degree) as well as a four-week in-service training programme for qualified librarians from Sub-Saharan Africa.

Staff members at the School of Information Technology collaborate with industry and academic partners from South Africa, the African continent and the rest of the world on a variety of research projects. The Department of Information Science in the SIT is the host for the African Centre of Excellence for Information Ethics (ACEIE) research centre. This centre identified a gap in the academic representation of the African continent on the global stage, specifically pertaining to Information Ethics, and started organising events to stimulate research on Information Ethics in Africa. The result of these activities and international collaboration has led to a partnership with the South African National Department of Communication, the United Nations Education, Scientific and Culture Organisation (UNESCO) and various universities across

Faculty highlights

Africa. One of the main objectives of the ACEIE is to develop a curriculum to teach Information Ethics in Africa. During the first three years the ACEIE developed a curriculum structure and implemented the content at universities in Africa.

A group of more than 30 international academics are working together on the pilot project. In November 2009, the Department of Communications (DoC) signed a five year Memorandum of Understanding (MoU) with the Department of Informatics, at the University of Pretoria (UP) towards establishing a relationship with the e-Skills Institute (e-SI) in the interest of e-Skills development. The purpose of the e-SI is to address the calamitous situation South Africa finds itself in with regard to developing suitable skills to sustain equitable prosperity and global competitiveness in the information society and knowledge economies. The Department of Informatics agreed to partner with the e-SI in order to establish the Gauteng e-Skills Knowledge Production and Coordination Hub.

The name has now been changed to reflect the focus area of the hub, to Creative New Media Industries (CoLab) at the University of Pretoria and the e-Skills Institute changed to the Ikamva National e-Skills Institute. The Department of Informatics is a partner in the ESEFA education project for Africa incubated at the University of Cape Town (UCT). This three-year project which aims to develop an Enterprise Systems (ES) education platform, curriculum and community for Sub-Saharan Africa kicked off in September 2013 in a ground-breaking partnership between the UCTs Information Systems department, the Otto-von-Guericke University Magdeburg (OvGU) in Germany and market leader SAP (AG) with its SAP University Alliances programme. The project is co-financed by DEG (Deutsche investitions- und Entwicklungsgesellschaft mbH) with public funds from the German Ministry for Economic Cooperation and Development, together with SAP (AG).The objective of the Public Private Partnership-Project (PPP-Project) is to establish an on-demand Enterprise Resource Planning (ERP) teaching and learning platform for (Sub-Saharan) Africa which is scalable and maintained independently from Africa.

The Department of Informatics is also a partner in the MOSAIC 2B European research project aiming to develop and test a new framework that uses cloud-based applications, innovative low-cost internet delivery mechanisms (delay tolerant networks and opportunistic communications) and affordable mobile technologies to unlock new mobile business opportunities, especially in rural villages. A consortium of European and South African partners builds upon the use case of mobile digital cinemas to run real life experiments demonstrating and evaluating the technological and economic viability of according innovations. Prof Hein Venter from the Department of Computer Science is the project editor of a new international standard: Incident Investigation Principles and Processes. The need for a standardised digital forensic investigation process is acknowledged world-wide, due to the disparities that exist among current digital forensic investigation processes. The project is in an advanced state and it is anticipated that the international standard will be published towards the end of 2014. Prof Venter is also involved in shaping another international standard guideline: Incident response. The Faculty also has extensive and cutting-edge teaching, learning and laboratory facilities integrated with the excellent suite of facilities and services offered by the University.

GRADUATE SCHOOL OF TECHNOLOGY MANAGEMENT (GSTM)

The GSTM offers internationally recognised management development programmes that address different needs in the fields of management of technology, engineering management and project management. Programmes are offered at honours, master's and doctoral levels. The School is involved in community activities and offers several certificate programmes and short courses in collaboration with Continuing Education at the University of Pretoria (Pty) Ltd (or CE at UP). The goal is to develop individual and organisational skills gained from research-based knowledge offered by experienced lecturers who are leaders in the industry. A strong focus on research ensures relevance to the market in terms of increased competitiveness, optimising product life-cycles, technology transfer and positioning technological abilities within the international context.

Contact information
Linda du Preez
Tel +27 (0)12 420 4937
Email linda.dupreez@up.ac.za

School of Engineering

Department of Chemical Engineering

BEng (Chemical Engineering)

What does the study programme entail?

Chemical engineering involves all the facets of industrial processes where raw materials are converted into higher-value products by means of physical, chemical, thermal, biochemical or mechanical changes. Such processes are applied in the oil, coal, fuel, paper, food and textile industries, and also in minerals processing, water and effluent treatment, and water that is needed in steam turbines for the generation of electrical power. These industries are collectively referred to as the process industry. Most industries employ people with training in chemical engineering.

Career opportunities

A chemical engineer may be involved in any of the stages of a typical project, from the inception of the idea to the sale of the final product, as indicated below:

- research and development
- techno-economic evaluation
- plant design and optimisation
- plant construction and commissioning
- project management
- plant operation and management
- problem-solving in production or in product applications
- manufacturing of equipment
- marketing of products

An increasingly important aspect of chemical engineering is the protection of the environment from pollution. As more and more companies and countries become aware of this responsibility, chemical engineers play an increasingly important role in conservation and the protection of the environment. Chemical engineers are also increasingly becoming involved in areas where biotechnology is applied on an industrial scale, as well as in the medical applications of engineering.

One of the characteristic qualities of chemical engineers is their ability to examine an engineering problem at different levels, from the detailed knowledge needed to manipulate the behaviour of molecules under very specific conditions to the knowledge needed to study and explain the effect of large chemical plants on a country's economy and also on its environment. Apart from the opportunity to be part of a team that successfully plans, designs and operates large processing plants, one could also decide to specialise in the application of advanced computer packages to design processing equipment, to compare alternative designs or to control a plant – even by means of remote control techniques. Chemical engineers are especially in demand at companies that develop such computer software.

Behind the scenes

Since chemical engineers are involved in such a variety of aspects of the process industry, people with widely divergent interests and temperaments can find themselves in interesting and challenging careers in that industry. Engineering mainly entails teamwork. The ability to act as a team member and as a team leader is important. This profession is exceptionally suited to women, and the number of females in the group is growing. In the past three years, 40% of the Department's graduates were female.

Due to the importance of the environment, the Department has been specialising in this field since 1970. Important work is being done in the fields of water purification, the general utilisation of water, air pollution control and waste management. Other departmental interests include process control of chemical production plants, optimisation, materials (with an emphasis on polymers), tribology (lubrication) and bioreaction engineering.

Contact information

Prof Philip de Vaal (Head of Department)
Tel +27 (0)12 420 2475
Fax +27 (0)12 420 5048
Email chemeng@up.ac.za
Website www.up.ac.za/chemeng

First year

First semester	Second semester
▪ Graphical Communication ▪ Calculus ▪ Physics ▪ General Chemistry ▪ Chemical Engineering ▪ Humanities and Social Sciences 1	▪ Calculus ▪ Linear Algebra ▪ Electricity and Electronics ▪ Mechanics ▪ General Chemistry ▪ Chemical Engineering ▪ Humanities and Social Sciences 2 ▪ Workshop Practice

Second year

First semester	Second semester
▪ Calculus ▪ Differential Equations ▪ Chemistry ▪ Programming and Information Technology ▪ Strength of Materials ▪ Chemical Engineering ▪ Chemical Engineering Materials ▪ Community-based Project	▪ Mathematics ▪ Numerical Methods ▪ Chemistry ▪ Electrical Engineering ▪ Engineering Statistics ▪ Thermodynamics ▪ Community-based Project

Third year

First semester	Second semester
▪ Engineering Management ▪ Transfer Processes ▪ Particle Technology ▪ Mass Transfer ▪ Chemical Engineering ▪ Professional and Technical Communication ▪ Practical Training	▪ Engineering Activity and Group Work ▪ Process Dynamics ▪ Kinetics ▪ Laboratory ▪ Chemical Engineering Design

Fourth year

First semester	Second semester
▪ Biotechnology ▪ Process Synthesis ▪ Process Control ▪ Reactor Design ▪ Research Project ▪ Practical Training	▪ Design Project ▪ Process Analysis ▪ Research Project ▪ Specialisation ▪ Chemical Engineering Practice

School of Engineering

Department of Civil Engineering

BEng (Civil Engineering)

What does the study programme entail?

Civil engineers create facilities that improve the quality of people's lives and the environment. This process entails research into the proposed facility, the planning, design and construction of the facility, as well as its continued maintenance. Civil engineers increasingly merge and use environmental management and information technology in their world of wealth creation.

Career opportunities

Civil engineers design, build and maintain constructions such as tower blocks and skyscrapers, dams, canals and pipelines, roads, bridges, tunnels, railway lines, airports, power stations, television towers, waterworks and outfall installations. They are increasingly involved in financial modelling, feasibility studies of projects and the management and rehabilitation of large asset portfolios.

Behind the scenes

The average person is probably aware that civil engineers plan, design, construct, maintain and demolish or rehabilitate basic infrastructure. This includes aspects such as water supply, sanitation, roads, buildings, bulk services, structures and dams. These facilities have a long lifespan, with a direct impact on man and the environment. Hence, civil engineers are trained to deal not only with the analytical aspects of design, but also to liaise and consult directly with communities and individuals in order to design, build and maintain such facilities cost-effectively to the benefit of humankind.

Most of the facilities civil engineers help to create are the infrastructure for wealth and job creation in other industries, such as factories and housing. The nature of civil engineering has changed drastically over the past decade or two with the utilisation of information technology and computer software. Mathematical modelling and designs are now being executed more effectively. This enables the civil engineer to concentrate on the more fundamental aspects of developmental work and design. The worldwide trend towards environmental awareness has a growing impact on the civil engineer's working methods. Information technology, and environmental engineering and management increasingly form a greater part of training, so that a civil engineer can still be provided with a broad-based qualification that offers challenging, fulfilling and highly adjustable career opportunities throughout an entire career lifespan of 40 to 50 years.

Contact information

Prof Elsabé Kearsley (Head of Department)
Tel +27 (0)12 420 2429
Fax +27 (0)12 362 5218
Email elsabe.kearsley@up.ac.za
Website www.up.ac.za/ebit

First year	
First semester	**Second semester**
▪ Graphical Communication ▪ Calculus ▪ General Chemistry ▪ Materials Science ▪ Humanities and Social Sciences 1	▪ Calculus ▪ Linear Algebra ▪ Physics ▪ Mechanics ▪ Electricity and Electronics ▪ Humanities and Social Sciences 2 ▪ Workshop Practice

I really enjoyed studying BEng (Civil Engineering), which I completed in 2014, at the University of Pretoria. The Department has some very passionate lecturers who are skilled in their field of expertise. I have learnt a lot, not only specifically about civil engineering, but also about people and life skills and to work hard for what you want in life. I have met a lot of great friends and built relationships with people with whom I will stay in contact for many years to come.

During my studies, I have received numerous awards for being the top student in specific subjects, top student in the final year of study, graduated cum laude, was awarded Golden Key International Honour Society membership and received a bursary from a well-known construction company that works both locally and internationally.

I have also been given valuable career opportunities by a number of local and international companies within the first few months after completing my studies, which have impacted significantly on me and motivated me to keep on working even harder to reach my dreams and to become successful in my career.

Marinus de Jager

School of Engineering

Second year	
First semester	**Second semester**
▪ Calculus ▪ Differential Equations ▪ Strength of Materials ▪ Professional and Technical Communication ▪ Geomaterials and Processes ▪ Statics ▪ Community-based Project	▪ Mathematics ▪ Numerical Methods ▪ Structural Analysis ▪ Pavement Materials and Design ▪ Engineering Statistics ▪ Civil Engineering Measurement Techniques ▪ Community-based Project

Third year	
First semester	**Second semester**
▪ Hydraulics ▪ Structural Analysis ▪ Civil Engineering Economics ▪ Programming and Information Technology ▪ Soil Mechanics ▪ Timber Design	▪ Hydraulics ▪ Geotechnical Engineering ▪ Civil Building Materials ▪ Steel Design ▪ Reinforced Concrete Design ▪ Transportation Engineering

Fourth year	
First semester	**Second semester**
▪ Hydraulics ▪ Research Project ▪ Steel Design ▪ Reinforced Concrete Design ▪ Infrastructure Planning ▪ Engineering Professionalism ▪ Practical Training	▪ Environmental Geotechnology ▪ Civil Engineering Construction Management ▪ Computer Applications in Civil Engineering ▪ Detailed Design

Department of Electrical, Electronic and Computer Engineering

BEng (Computer Engineering)

What does the study programme entail?

Computer engineering is one of the three internationally accepted and closely related subdisciplines of the traditional field of electrical engineering (electrical engineering, electronic engineering and computer engineering). Computer engineering is the most dynamic and rapidly growing engineering discipline in the vast and constantly expanding field of information and communication technology (ICT). There is hardly a technological system in the world that does not rely on computer engineering. It involves a combination of electronics, computer systems (hardware and software) and communication systems. A computer engineer is someone with a talent for optimising electronic systems with dedicated computing systems and control software. This includes computer and communication networks of all sizes – from a couple of microcontrollers to the worldwide web. It is essential to know what this career entails before enrolling for the study programme.

A computer engineer has a good understanding of the basic sciences and a sound education in the theoretical and practical aspects (including design methodology) of electronics, digital systems, computer systems and control software. With the dramatic increase in computing and storage capabilities, as well as a decrease in size and cost, most technological systems include components of computer engineering.

I completed my degree in Computer Engineering at the Department of Electrical, Electronic and Computer Engineering in 2013. The study programme was challenging and taught me invaluable skills, and the EBIT Faculty provided me with the resources and support to achieve my potential. This is ultimately why I was able to find my dream job.

At the end of my final year of study, the University of Pretoria granted me the opportunity to participate in the International Robotics Challenge along with a few of my fellow students. It was an amazing experience, and allowed me to apply the knowledge I had gained from my studies.

In the final year of my studies, I received the prize for the best student in computer engineering, as well as for the best final-year software engineering project.

I am fortunate enough to say that I have found my dream job; I am currently working as an information security consultant at MWR InfoSecurity.

Christo Erasmus

School of Engineering

The computer engineering degree at the University of Pretoria was developed in 1998 to deliver graduates who can undertake the most demanding challenges of the ICT world in all its forms. Examples of computer engineering include cellphone technology, car control computers for engine management, entertainment systems, security systems, air-conditioning, active suspension and the anti-lock braking system (ABS). These all use the principles of sensing, computing and actuation under optimised software control. This is the fastest growing new discipline in engineering with job opportunities all over the world.

- Computer engineering is used in the following fields in particular: telecommunications, computer networking, cellphone operations, computer system companies, military technologies (avionics, night vision, electronic warfare, smart bombs, drones, laser target designators), transport technologies (toll roads), internet banking, security systems, consumer equipment, modems, hand-held scanners, voting, medical systems (portable and remote diagnostic recorders), robotics, entertainment equipment, global positioning system (GPS) navigation, measurement and control software, and fibre-optic networks (self-healing networks). A computer engineer has to be innovative and stay abreast of new technologies and developments in software and hardware. Many computer engineers move very quickly into management, where their analytical, synthesis, managerial and leadership skills are used to reach the highest levels of corporate management.

The aim of computer engineering is to integrate electronic, computing and control systems in the best way possible to ensure fast, small and powerful systems. Typical subsystems include sophisticated software for artificial intelligence, biometrics, radio frequency (RF) subsystems and real-time applications, software engineering, human language technologies, e-commerce, m-commerce, billing software, data security and various networking applications, such as storage area networks.

Career opportunities

Computer engineering graduates have a wide range of job opportunities. These include working for a company (large or small) anywhere in the world as an employee, being an entrepreneur or being self-employed. Research and development opportunities are available in communication, computer systems, networking, peace-keeping operations, medical, transportation, software and electronics companies in South Africa and all over the world. This provides the opportunity to innovate: thinking of a problem to be solved, and coming up with a solution, even possibly patenting the idea. The academic study programme at the University of Pretoria prepares students to be leaders in the field of computer engineering – with excellent financial rewards and professional satisfaction.

Behind the scenes

The Department has well-equipped laboratories for training and research in all the important and dynamic subfields of computer engineering. From the first year of study, students do experiments (hardware, software and electronics) in these laboratories. The laboratories are equipped with state-of-the-art equipment and compare well with the best in the world. Beyond the general laboratories, the Department also has a number of centres of excellence in specific fields, such as networking (Cisco), advanced computing (Intel) and distributed sensor networks. It also shares laboratories with electrical and electronic engineering, such as those for microelectronics (the Carl and Emily Fuchs Institute for Microelectronics), electromagnetism/radar (the compact antenna and radar range), broadband wireless multimedia communications (the Sentech Chair), photonics, telecommunications (the Centre for Radio and Digital Communications), the Centre for New Energy Systems and the National Energy Efficiency and Demand-side Management Hub.

To determine whether this is the correct engineering discipline for you, do the following:

- Compare the academic study programmes of the University of Pretoria with similar programmes in South Africa and elsewhere in the world. Are they focused on preparing one for a profession? Will graduates get the job?
- Verify the achievements of the University of Pretoria's lecturers in terms of qualifications, professional registration with the Engineering Council of South Africa (ECSA), international research articles published, the number and frequency of patent registrations, membership of international professional societies, such as the Institute of Electrical and Electronics Engineers (IEEE), and industry involvement through consulting.
- Check the quality of the University of Pretoria's students in terms of prizes and awards received. Are they the best students in the country who will ensure competition and critical learning?
- Are there sufficient job opportunities for students of this discipline (both now and for the next 50 years)?

To verify these claims, visit the website and/or the Department.

Contact information

Email eerc@up.ac.za
Website www.ee.up.ac.za

Dr Herman Myburgh (Function Head: Marketing)
Tel +27 (0)12 420 4540
Email herman.myburgh@up.ac.za

First year

First semester	Second semester
▪ Physics ▪ Calculus ▪ Electricity and Electronics ▪ Introduction to Programming ▪ Humanities and Social Sciences 1 **Recess Training:** ▪ Introduction to Laboratory Measurements and Computer Simulations ▪ Information Technology Practice	▪ Calculus ▪ Linear Algebra ▪ Mechanics ▪ Program Design: Introduction ▪ Humanities and Social Sciences 2 ▪ Operating Systems

Second year

First semester	Second semester
▪ Calculus ▪ Differential Equations ▪ Data Structures and Algorithms ▪ Electrical Engineering ▪ Materials Science ▪ Professional and Technical Communication ▪ Community-based Project **Recess Training:** ▪ Information Technology Practice	▪ Mathematics ▪ Numerical Methods ▪ Linear Systems ▪ Digital Systems ▪ Engineering Statistics ▪ Community-based Project

School of Engineering

Third year	
First semester	**Second semester**
▪ Engineering Management ▪ Microprocessors ▪ Analogue Electronics ▪ Intelligent Systems ▪ Electromagnetic Compatibility **Recess Training:** ▪ Information Technology Practice	▪ Engineering Activity and Group Work ▪ Computer Engineering Design ▪ Software Engineering ▪ Control Systems ▪ Digital Communications

Fourth year	
First semester	**Second semester**
▪ Project ▪ Engineering Professionalism ▪ DSP Programming and Application ▪ Computer Engineering: Architecture and Systems ▪ e-Business and Network Security **Recess Training:** ▪ Practical Training and Report	▪ Project ▪ Specialisation

BEng (Electrical Engineering)

What does the study programme entail?

Electrical engineering is one of the three internationally accepted and closely related subdisciplines in the traditional field of electrical engineering (electrical engineering, electronic engineering and computer engineering). Electrical engineering entails the vast and constantly expanding field of the "electrical energy world". There is hardly a technological system in the world that does not rely on electrical power as a source of energy. An electrical engineer is someone with a talent for introducing alternative and renewable sources of electrical energy into everyday life.

Huge challenges exist for utilising and storing electrical energy from such sources as the sun (solar energy), wind, biomass, water (hydro-energy) and even nuclear energy. In South Africa, pumped storage systems are extensively used and new systems are under construction. The next steps in the chain from generating to utilising electrical energy are the transmission and distribution systems. The most cost-effective way of saving electrical energy is to spend a great deal of research and development time and money on sustainable energy-efficient equipment, from electrical machines to geysers and lighting.

An electrical engineer has a good understanding of basic sciences and a good education in the theoretical and practical aspects (including design, installation and maintenance methodology) of electrical engineering. In the midst of the worldwide crisis of the environmentally friendly generation of power and energy, there is a shortage of qualified electrical engineers all over the world.

The electrical engineering degree at the University of Pretoria was developed over many years to provide exactly what the industry expects from such an engineer. There are extremely exciting opportunities worldwide for electrical (high-current) engineers capable of taking the lead with sustainable and environmentally friendly electrical energy generation, transmission and utilisation. Electrical cars (including series and parallel hybrid vehicles) have already been introduced by most car manufacturers and there are many new entrants to the market.

Electrical engineering is prevalent in almost all application fields and technologies where electrical energy is consumed. Every known piece of equipment requires a source of energy – powered by mains, batteries or photovoltaic (PV) cells – and needs the skill of an electrical engineer. The transport and manufacturing industries are excellent examples of electrical engineering, where electrical engineers use their excellent skills in designing, developing and maintaining the electrical machines (motors and generators) with control systems for optimal performance. Most ships and trains are electrically powered.

Other applications of electrical engineering include power reticulation in cities, townships, shopping malls and factories. The lighting of indoor and outdoor areas forms the basis of our daily activities and includes sport stadiums, street lighting, safety and security lighting, task and ambient lighting, as well as lighting for offices, entertainment and many other specialist applications. Whether it is medicine, the military, entertainment, sport, education or any other field of technology, electrical engineers will be there to provide the energy and control required by these systems.

Mining operations cannot take place 24 hours a day without the extensive involvement of electrical engineering. When one considers the fact that the sun produces one gigawatt of energy per square kilometre, one soon realises that all peoples' energy needs can be met by the sun. An electrical engineer has to be innovative and stay abreast of new technologies. Many electrical engineers move into management very quickly, where their analysis, synthesis, managerial and leadership skills are used to reach the highest levels of corporate management. There is a worldwide shortage of electrical engineers.

The aim of electrical engineering is to change the world with respect to generating, transmitting, distributing and utilising electrical energy in an environmentally friendly and sustainable way. Typical subsystems that may form part of larger electrical systems are electrical machines of all sizes and shapes, power electronics, control systems, power system components, power quality and network stability, lamps and lighting, power supplies, photovoltaic (PV) cells, solar geysers, space systems, robotics and energy management systems.

Career opportunities

Electrical engineering graduates have a wide range of job opportunities. These include working for electricity utility companies, mining houses, municipalities, consulting engineers, transportation (rail and sea) companies and research organisations, locally and elsewhere in the world. The opening up of electrical energy generation and distribution creates tremendous opportunities for entrepreneurs in South Africa and abroad. Research and development opportunities are available at institutions such as Denel, Eskom, the Council for Scientific and Industrial Research (CSIR) and Transnet. This provides an opportunity to innovate and participate in the exciting world of electrical energy generation, transmission, distribution and utilisation. An innovative approach to management and leadership skills will assure a long and prosperous career. The academic study programme at the University of Pretoria prepares students for all aspects of electrical engineering, enabling them to enter the job market ahead of generalist engineers.

It was an amazing opportunity for me to be part of the EBIT Faculty from 2010 to 2013. As an electrical engineering student in the Electrical, Electronic and Computer Engineering Department, I had the opportunity to learn through theoretical and practical means, which I feel is very important for students. Electrical technologies are rapidly evolving due to the huge worldwide focus on a more energy-efficient and environmentally friendly energy sector. Therefore I feel that there are great opportunities for electrical engineers to get involved in world-changing technologies, and this is what inspires me as an electrical engineer.

For as long as I can remember I have wanted to study engineering, and it was a great opportunity for me to be accepted for, and study engineering at the University of Pretoria. I feel that studying engineering has moulded me into the person I have always wanted to become. I am still not fully aware of the impact my studies had on my life, but I know it gave me the fundamental skills that have allowed me to start my career in a global consulting firm. I am very excited for what the future has in store for me.

During my studies, I was selected as a member of the Golden Key International Honour Society. Furthermore, I received a silver merit award in 2011, a bronze merit award in 2012, and academic honorary colours in 2013. The Gustav Heymann Prize was also awarded to me in 2013.

My dream job is a job that will challenge me daily, push me to new limits and require me to become the best engineer that I can possibly become.

Justin Lotter

School of Engineering

Behind the scenes

The Department has well-equipped laboratories for training and research in all the important and dynamic subfields of electrical engineering. From the first year of study, students undertake experiments in some of these laboratories. The laboratories are equipped with state-of-the-art equipment from the best international companies. They compare very well with the best in the world. Beyond the general laboratories, the Department also has a number of centres of excellence in specific fields, such as the Centre for New Energy Systems, the National Energy Efficiency and Demand-side Management Hub, Power System Analysis, Photometry and Radiometry, and Electrical Machine Efficiency. It also shares laboratories with electronic and computer engineering, such as those for microelectronics (the Carl and Emily Fuchs Institute for Microelectronics), electromagnetism/radar (the compact antenna and radar range), broadband wireless multimedia communications (the Sentech Chair), photonics, telecommunications (the Centre for Radio and Digital Communications), the Advanced Computing Centre and the Cisco Regional Computer Networking Academy.

To determine whether this is the correct engineering discipline for you, do the following:

- Compare the academic study programmes of the University of Pretoria with similar programmes in South Africa and elsewhere in the world. Are they focused on preparing one for a profession? Will graduates get the job?
- Verify the achievements of the University of Pretoria's lecturers in terms of qualifications, professional registration with the Engineering Council of South Africa (ECSA), international research articles published, the number and frequency of patent registrations, membership of international professional societies such as the Institute of Electrical and Electronics Engineers (IEEE), and industry involvement through consulting.
- Check the quality of the University of Pretoria's students in terms of prizes and awards received. Are they the cream of the students in the country who will ensure competition and critical learning?
- Are there sufficient job opportunities for students of this discipline (both now and for the next 50 years)?

To verify these claims, visit the website and/or the Department.

Contact information

Email eerc@up.ac.za
Website www.ee.up.ac.za

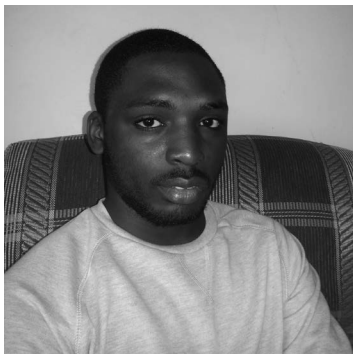
Dr Herman Myburgh (Function Head: Marketing)
Tel +27 (0)12 420 4540
Email herman.myburgh@up.ac.za

First year

First semester	Second semester
▪ Graphical Communication ▪ Calculus ▪ General Chemistry ▪ Materials Science ▪ Humanities and Social Sciences 1 **Recess Training:** ▪ Introduction to Laboratory Measurements and Computer Simulations	▪ Calculus ▪ Linear Algebra ▪ Physics ▪ Mechanics ▪ Electricity and Electronics ▪ Humanities and Social Sciences 2

Second year

First semester	Second semester
▪ Calculus ▪ Differential Equations ▪ Dynamics ▪ Electrical Engineering ▪ Introduction to Programming ▪ Professional and Technical Communication ▪ Community-based Project **Recess Training:** ▪ Practical Wiring	▪ Mathematics ▪ Numerical Methods ▪ Engineering Statistics ▪ Linear Systems ▪ Digital Systems ▪ Community-based Project



The Electrical, Electronic and Computer Engineering Department has an impressive research base and research output. I have gained vast knowledge in electrical engineering and opportunities in industry as a graduate of the Department.

Given that I'm from a slightly disadvantaged background, the very opportunity to study in South Africa was a valuable one. To top this, I have been awarded a scholarship by the National Energy Hub to continue my postgraduate studies as part of the Energy Efficiency and Demand-side Management Research Group.

In 2013, I received the Gustav Heymann award for the second-best electrical engineering student of that year. In my first, second and third year, I received departmental awards for the best electrical engineering student.

At the moment, I am working as an energy system consultant.

Titus Haibambo

School of Engineering

Third year	
First semester	**Second semester**
▪ Engineering Management ▪ Electromagnetism ▪ Microprocessors ▪ Analogue Electronics ▪ Electrical Machines **Recess Training:** ▪ DSP Programming	▪ Power System Components ▪ Engineering Activity and Group Work ▪ Control Systems ▪ Power Electronics ▪ Electrical Engineering Design

Fourth year	
First semester	**Second semester**
▪ Project ▪ Engineering Professionalism ▪ Electrical Drives ▪ Power System Analysis ▪ Automation **Recess Training:** ▪ Practical Training and Report	▪ Project ▪ Energy

BEng (Electronic Engineering)

What does the study programme entail?

Electronic engineering is one of the three internationally accepted and closely related subdisciplines in the traditional field of electrical engineering (electrical engineering, electronic engineering and computer engineering). Electronic engineering entails the vast and constantly expanding field of the "electronic world and era". There is hardly a technological system in the world that does not rely on electronics and electronic engineering. An electronic engineer is someone with a talent for introducing new technologies and upgrading old technologies.

An electronic engineer has a good understanding of the basic sciences and a good education in the theoretical and practical aspects (including design methodology) of electronics and electronic engineering systems. With the drastic increase in the development of new electronic systems all over the world, it is essential to be well prepared for the work of an electronic engineer.

The electronic engineering degree at the University of Pretoria was developed over many years to provide exactly what the industry expects from such an engineer. This is an exciting world, with the "half-life" of microelectronics and photonics being approximately two-and-a-half years. There are constant improvements and developments.

Electronic engineering is used in almost all information, communication and technology (ICT) application fields, especially those of telecommunications (cellphones, broadcasting, internet service providers (ISPs), telecommunications companies (Telcos), global positioning systems (GPSs), transport (aeroplanes, ships, trains, motor cars), consumer equipment (iPods, induction stoves, fridges, microwaves, televisions), peace-keeping operations (avionics, night vision, electronic warfare, smart bombs, drones, laser target designators), medicine (bioengineering, diagnostic systems, rehabilitation engineering, intensive care units, laser surgery), robotics (mechatronics, mine robots, spacecraft), entertainment (video games, shows, casinos), mining, manufacturing, navigation, communication, satellite surveillance (day and night), entrance control, face recognition) and photonics (lasers, optical fibres, networking).

Electronic engineers have to be innovative and ensure that they stay abreast of new technologies. Many electronic engineers move very quickly into management, where their analytical, synthesis, managerial and leadership skills are used to reach the highest levels of corporate management. A number of graduates of this Department have sold their ideas (patents) for hundreds of millions of rands.

The aim of electronic engineering is to do things faster, cheaper, in smaller sizes and with much more control and artificial intelligence. Typical subsystems that form part of larger electronic systems are amplifiers, transmitters, receivers, control systems, sensor systems, power supplies, radio frequency (RF) subsystems, micro- and nanoelectronics and microprocessors, digital signal processors (DSPs) and field-programmable gate arrays (FPGAs). Most electronic systems use a standard process of measurement (sensing), calculate/compare/store information and controlled outputs (actuators) with extensive computing and communication power.

Career opportunities

Electronic engineering graduates have a wide range of job opportunities. These include working for companies (large or small) anywhere in the world as employees, or being entrepreneurs or self-employed. Research and development opportunities are available at electronics and microelectronics companies in South Africa, research institutes (such as the CSIR) and universities all over the world. It thus provides graduates with the opportunity to innovate: that is to identify real-life problems and to come up with solutions, and possibly even patenting their ideas. The academic study programme at the University of Pretoria prepares students to be leaders in the field of electronic engineering – with excellent financial rewards and professional satisfaction.

Behind the scenes

The Department has well-equipped laboratories for training and research in all the important and dynamic subfields of electronic engineering. From the first year of study, students undertake experiments in these laboratories. The laboratories are equipped with state-of-the-art equipment from the best international companies. In addition to the general laboratories, the Department also has a number of centres of excellence in specific fields such as microelectronics (the Carl and Emily Fuchs Institute for Microelectronics), electromagnetism/radar (the Compact Antenna and Radar Range), broadband wireless multimedia communications (the Sentech Chair), telecommunications (the Centre for Telecommunications Engineering (CeTEIS) and the Centre for Radio and Digital Communication (CRDC)). It also shares laboratories with electrical and computer engineering, such as the Advanced Computing Centre, the Centre for New Energy Studies, the National Energy Efficiency and Demand-side Management Hub and the Cisco Regional Computer Networking Academy.

To determine whether this is the correct engineering discipline for you, do the following:

- Compare the academic programmes of the University of Pretoria with similar study programmes in South Africa and elsewhere in the world. Are they focused on preparing one for a profession? Will graduates get the job?
- Verify the achievements of the University of Pretoria's lecturers in terms of qualifications, professional registration with the Engineering Council of South Africa (ECSA), international research articles published,

School of Engineering

the number and frequency of patent registrations, membership of international professional societies, such as the Institute of Electrical and Electronics Engineers (IEEE), and industry involvement through consulting.
- Check the quality of the University of Pretoria's students in terms of prizes and awards received. Are they the best students in the country who will ensure competition and critical learning?
- Are there sufficient job opportunities for students of this discipline (both now and for the next 50 years)?

To verify these claims, visit the website and/or the Department.

Contact information

Email eerc@up.ac.za
Website www.ee.up.ac.za

Dr Herman Myburgh (Function Head: Marketing)
Tel +27 (0)12 420 4540
Email herman.myburgh@up.ac.za

First year

First semester	Second semester
▪ Graphical Communication ▪ Calculus ▪ General Chemistry ▪ Materials Science ▪ Humanities and Social Sciences 1 **Recess Training:** ▪ Introduction to Laboratory Measurements and Computer Simulations	▪ Calculus ▪ Linear Algebra ▪ Physics ▪ Mechanics ▪ Electricity and Electronics ▪ Humanities and Social Sciences 2

Second year

First semester	Second semester
▪ Calculus ▪ Differential Equations ▪ Dynamics ▪ Electrical Engineering ▪ Introduction to Programming ▪ Professional and Technical Communication ▪ Community-based Project	▪ Mathematics ▪ Numerical Methods ▪ Engineering Statistics ▪ Linear Systems ▪ Digital Systems ▪ Community-based Project

Third year

First semester	Second semester
▪ Engineering Management ▪ Electromagnetism ▪ Analogue Electronics ▪ Microprocessors ▪ Modulation Systems	▪ Engineering Activity and Group Work ▪ Microwaves and Antennas ▪ Stochastic Communication Systems ▪ Control Systems ▪ Electronic Engineering Design

Fourth year

First semester	Second semester
▪ Project ▪ Engineering Professionalism ▪ DSP Programming and Application ▪ Advanced Electronics ▪ Automation **Recess Training:** ▪ Practical Training and Report	▪ Project ▪ Specialisation

I am a BEngHons (Microelectronics) student under the supervision of Dr Tinus Stander at the Carl and Emily Fuchs Institute for Microelectronics (CEFIM), housed by the Department of Electrical, Electronic and Computer Engineering. My postgraduate research interests are in monolithic microwave and mm-wave integrated circuit technologies, with a focus on applications in the Square Kilometre Array (SKA) project.

As a student at the Department of Electrical, Electronic and Computer Engineering, which is accredited by the Washington Accord, I have been given the opportunity to learn from experts and world-class researchers in the field of electronic engineering. The Department has the only microelectronics research institute on the African continent. Because of this, I have the unique opportunity of continuing my postgraduate studies in the exciting and mysterious field of microelectronics, which has formed an indispensable part of modern technology and everyday life. I have also been awarded the undergraduate (fourth year) and postgraduate SKA scholarships for the years 2013 to 2015.

My academic goal is to continue cutting-edge research in microwave and mm-wave microelectronics. I am also interested in future research in terahertz electronics.

Piotr Osuch

School of Engineering

Department of Industrial and Systems Engineering

BEng (Industrial Engineering)

What does the study programme entail?

Industrial engineers are generally responsible for the analysis, design, planning, implementation, operation, management and maintenance of integrated systems. These systems consist of people, capital, material, equipment, information and energy. The aim is to increase the productivity of the organisation and create wealth.

Career opportunities

Since almost any organisation could benefit from the services of industrial engineers, they are employed in a wide variety of organisations in the industrial, business and service sectors. Typical activities comprise the following:

- design, implementation and management of production processes and equipment
- design and improvement of plant layout
- design and improvement of business processes
- functional design and implementation of information systems
- development and implementation of performance criteria and standards
- provision of decision support
- scheduling of activities
- analysis of systems with the aid of mathematical and simulation models
- economic evaluation of alternatives
- integration of new systems in an existing environment

Behind the scenes

Is engineering a profession intended mainly for men? As far as industrial engineering is concerned, the answer to this question is a resounding 'no'. Women who have completed their industrial engineering degrees at the University of Pretoria have come into their own in this profession and are counted among the top achievers, both as academics and as practising engineers. This Department is the largest of its kind in South Africa and currently has more than 500 students. Academic staff are specialists in their respective fields. Alumni of the Department have made major contributions in several spheres of society and occupy important positions in organisations throughout South Africa. Others are employed overseas. Currently, the demand for industrial engineers exceeds the supply and young graduates are virtually assured of employment.

Contact information

Prof Sarma Yadavalli (Head of Department)
Tel +27 (0)12 420 2979
Fax +27 (0)12 362 5103
Email sarma.yadavalli@up.ac.za
Website www.up.ac.za/ie

First year

First semester	Second semester
▪ Graphical Communication ▪ Physics ▪ Calculus ▪ Humanities and Social Sciences 1 ▪ Electricity and Electronics	▪ Calculus ▪ Linear Algebra ▪ General Chemistry ▪ Mechanics ▪ Materials Science ▪ Humanities and Social Sciences 2 ▪ Workshop Practice

Second year

First semester	Second semester
▪ Calculus ▪ Differential Equations ▪ Dynamics ▪ Programming and Information Technology ▪ Manufacturing and Design ▪ Professional and Technical Communication ▪ Community-based Project	▪ Mathematics ▪ Numerical Methods ▪ Engineering Statistics ▪ Productivity ▪ Thermodynamics ▪ Community-based Project

Third year

First semester	Second semester
▪ Engineering Management ▪ Business Law ▪ Manufacturing Systems ▪ Operational Management ▪ Operations Research ▪ Financial Management ▪ Industrial Analysis ▪ Practical Training	▪ Engineering Activity and Group Work ▪ Industrial Logistics ▪ Information Systems Design ▪ Simulation Modelling ▪ Facilities Planning

Fourth year

First semester	Second semester
▪ Operations Research ▪ Quality Assurance ▪ Management Accounting ▪ Engineering Professionalism ▪ Project ▪ Practical Training	▪ Project ▪ Labour Relations ▪ Business Engineering ▪ Systems Engineering ▪ Engineering Economics

Department of Materials Science and Metallurgical Engineering

BEng (Metallurgical Engineering)

What does the study programme entail?

South Africa is blessed with the world's largest mineral deposits of gold, chromium, platinum, vanadium and manganese. This country also has large reserves of iron, lead, zinc, copper, nickel, coal and diamonds. The minerals industry contributes to some 50% of South Africa's exports and is one of the largest employers in the country. The metallurgical engineer plays a key role in the production of minerals and metals. Metallurgical engineers help to process metals into final products with added value. In this way, maximum income is generated in international markets.

Career opportunities

The metallurgical engineer plays a key role in the process of extracting wealth from the resources of South Africa and can be involved in three major fields of specialisation in metallurgical engineering:

- Minerals processing. Processing the ore to release and concentrate the valuable minerals from the minerals resource.

Industrial engineering is one of the most diverse fields of study around. It does not limit you to one job or even career type and it can open up opportunities in almost any direction you can dream of. This is why I chose to become an industrial engineer and why I love it.

The University of Pretoria was the first academic institution to have an Industrial and Systems Engineering Department, and according to me, this makes it the best in the country. Some of the current Faculty members were in the first group that graduated from this Department and they love to share their experiences and expertise. One will learn a lot more from the lecturers and their experiences than from a textbook, and that is knowledge one cannot buy.

The Department of Industrial and Systems Engineering also goes all out for their students. This is one of the few departments who will spend money on speakers, field trips, career advice evenings and social activities to get you ready and excited to start your career. I have also been very fortunate to attend a free training programme that will most definitely help me in my career.

I graduated in 2013 and was awarded a medal from the South African Institute for Industrial Engineering for the best final-year industrial engineering student, academic honorary colours, as well as the Louis Heyl prize for the best final-year project in industrial engineering.

My dream job will be to incorporate my industrial engineering skills into an environment associated with the conservation of cheetah and other endangered animals or perhaps even become an astronaut!

Liezl Koornhof

School of Engineering

- Extractive metallurgy. The processing of mineral concentrates to metals through pyrometallury, for example, smelting or hydrometallurgy as recovery step.
- Physical metallurgy. The development of new alloys, the production of useful materials from raw metals, forming through casting and joining through welding, for instance. The investigation of failures is also of great importance.

Graduates in metallurgical engineering are responsible for process design and optimisation, commissioning, marketing, business analysis and research. There is a place for everyone in metallurgical engineering!

Behind the scenes

The Department of Materials Science and Metallurgical Engineering is currently the only independent metallurgical engineering department at a South African university. It therefore plays a leading role in the education of metallurgical engineers for the South African metallurgical and mining industries, and its graduate students are sought after. In addition, many graduate engineers from other disciplines take courses in the Department to enhance their skills in the rich minerals industry (in South Africa and abroad).

Unconditional accreditation by the Engineering Council of South Africa (ECSA) is a confirmation of the quality of undergraduate teaching in the Department. Furthermore, the degree currently enjoys international recognition. Its staff consults and performs research for industry and maintain close contact with local metallurgical industries to ensure that teaching and research are in line with industry needs. Sophisticated research equipment is available in the Department, as well as in the Industrial Metals and Minerals Institute (IMMRI), which is situated in the Department. Bursaries for metallurgical engineering are also available from various industry partners (see the website for additional information: www.up.ac.za/metal).

Students are supported in several ways by the Department. A member of staff is appointed as mentor for each year group to help students overcome problems. For first-year students in particular, there is an intensive mentorship programme. The normal study programme runs over four years, but there is also a five-year programme (ENGAGE) for students who require additional support and mentoring. Social and sports functions are organised by the Metallurgical Student Association.

The Department of Materials Science and Metallurgical Engineering is an environment full of highly skilled individuals that have many years of experience in industry and in academia. I have enjoyed studying in this Department and continue to do so on a postgraduate level in welding engineering. Through its expert management and student guidance, the EBIT Faculty has made every opportunity possible that I have dreamt of.

I have been given the opportunity to work alongside Prof Madeleine du Toit (former Head of the Department of Materials Science and Metallurgical Engineering), and I can attribute many of my successes to her for encouraging me to become a person who thinks outside the box. Additionally, the Department's welding engineering team has phenomenal skills and its members come from diverse backgrounds that enrich us all in a personal and academic manner.

One of my achievements was a second place at the Southern African Institute of Mining and Metallurgy (SAIMM) student colloquium for a project that I completed in my final year of undergraduate studies. I received the award for the best project of the class of 2013 in the Department, and have been awarded a bursary to complete my honours and master's degrees in welding engineering.

My dream is to acquire my International Welding Engineering Certificate and register with the Engineering Council of South Africa (ECSA) as a Professional Engineer, and then to start a welding consultation business with skilled professionals. This will serve any industry that uses welding as a metal-to-metal joining method.

Kristian Kruger

School of Engineering

Additional information

Visit the website of the Department at www.up.ac.za/metal and follow them on twitter: @metalUPSA. Also visit the sites of organisations such as the Southern African Iron and Steel Institute (SAISI) at saisi.co.za, the Southern African Institute of Mining and Metallurgy (SAIMM) at saimm.co.za or companies such as ArcelorMittal, Columbus Stainless, Highveld Steel and Vanadium, Scaw, Davsteel, Anglo American, De Beers, Samancor, BHP Billiton, Amcoal, Glencore Xstrata, Mintek, the CSIR, Hatch Africa and Pyromet.

Contact information

Prof Waldo Stumpf (Acting Head of Department)
Tel +27 (0)12 420 3182
Fax +27 (0)12 362 5304
Email gabi.ngema@up.ac.za
Website www.up.ac.za/metal

First year	
First semester	**Second semester**
▪ Graphical Communication ▪ General Chemistry ▪ Materials Science ▪ Calculus ▪ Humanities and Social Sciences 1	▪ Calculus ▪ Linear Algebra ▪ Electricity and Electronics ▪ Mechanics ▪ Physics ▪ Humanities and Social Sciences 2 ▪ Workshop Practice

Second year	
First semester	**Second semester**
▪ Calculus ▪ Differential Equations ▪ Dynamics ▪ Programming and Information Technology ▪ Mineralogy ▪ Professional and Technical Communication ▪ Community-based Project	▪ Mathematics ▪ Numerical Methods ▪ Electrical Engineering ▪ Materials Science ▪ Process Thermodynamics ▪ Engineering Statistics ▪ Community-based Project

Third year	
First semester	**Second semester**
▪ Materials Science ▪ Minerals Processing ▪ Engineering Management ▪ Thermoflow ▪ Electrochemistry ▪ Practical Training	▪ Hydrometallurgy ▪ Pyrometallurgy ▪ Refractory Materials ▪ Mechanical Metallurgy ▪ Engineering Activity and Group Work ▪ Excursions

Fourth year	
First semester	**Second semester**
▪ Process Metallurgy and Control ▪ Literature Survey ▪ Hydrometallurgy ▪ Minerals Processing ▪ Metals Processing ▪ Engineering Professionalism ▪ Practical Training	▪ Project ▪ Process Design

Department of Mechanical and Aeronautical Engineering

BEng (Mechanical Engineering)

What does the study programme entail?

Mechanical and aeronautical engineering entails the application of science to design, manufacture, operate and maintain mechanical and aeronautical equipment and processes. The undergraduate course focuses on the establishment of a broad knowledge of engineering and includes subjects such as dynamics, strength of materials, thermodynamics, fluid mechanics and design. The outputs of mechanical and aeronautical engineers include products and services that add value to the economy of the country. Mechanical and aeronautical expertise are instrumental in the design and manufacture of products and services, for example, the provision of electricity and water, transport (road, railway and air), mining activities, mechatronics and air-conditioning. As a result of the broad technical background, mechanical and aeronautical engineers often develop into very successful senior managers towards the latter part of their careers.

Career opportunities

The completion of a degree in mechanical and aeronautical engineering may be regarded as the key to a successful and exciting career. As a result of the broad technical background, the career opportunities are countless. Graduate mechanical and aeronautical engineers will typically start their careers in one of the following areas: research, design, development, manufacturing, commissioning, maintenance or marketing of mechanical and aeronautical equipment and products. Later in their careers, they will typically choose between being technical specialist engineers or senior managers. As a result of the strong emphasis on innovation during the study programme, many mechanical and aeronautical engineers develop their own businesses successfully.

Behind the scenes

The extent of the excellence of an engineering faculty is determined by the quality of its lecturers, as well as its physical facilities. In the Department of Mechanical and Aeronautical Engineering at the University of Pretoria, prospective students may rest assured that they will receive first-class education, comparable to the best in the world. The international accreditation of the graduate programme by the Engineering Council of South Africa (ECSA) bears testimony to this. The lecturers in the department are all actively involved in the industry, either as consultants or as researchers. Students are thus assured that the knowledge that is transferred to them is the latest and most technologically advanced. The Department has already received eight design awards from the South African Bureau of Standards. In terms of physical facilities, it has modern and fully equipped laboratories and computer facilities. This Department is the largest of its kind in South Africa. At undergraduate level, about 20% of students are female, and the Department would like to increase this to approximately 50%. Alumni of the Department have made great contributions in several spheres of society and occupy important positions in organisations throughout South Africa. Others are employed overseas. Currently, the demand for mechanical and aeronautical engineers exceeds the supply and young graduates are virtually assured of employment.

School of Engineering

General enquiries and applications
Client Service Centre
Tel +27 (0)12 420 3111
Email csc@up.ac.za

Academic enquiries
Prof Josua Meyer (Head of Department)
Tel +27 (0)12 420 3104
Fax +27 (0)12 420 6632
Email mecheng@up.ac.za
Website www.me.up.ac.za

First year

First semester	Second semester
▪ Graphical Communication ▪ Calculus ▪ Physics ▪ Electricity and Electronics ▪ Humanities and Social Sciences 1	▪ Calculus ▪ Linear Algebra ▪ Mechanics ▪ Materials Science ▪ Humanities and Social Sciences 2 ▪ General Chemistry ▪ Workshop Practice

Second year

First semester	Second semester
▪ Manufacturing and Design ▪ Programming and Information Technology ▪ Dynamics ▪ Calculus ▪ Differential Equations ▪ Professional and Technical Communication ▪ Community-based Project	▪ Structural Design ▪ Thermodynamics ▪ Mathematics ▪ Numerical Methods ▪ Engineering Statistics ▪ Community-based Project

Third year

First semester	Second semester
▪ Structural Mechanics ▪ Thermodynamics ▪ Engineering Management ▪ Machine Design ▪ Thermoflow ▪ Practical Training	▪ Vibration and Noise ▪ Solid Mechanics ▪ Engineering Activity and Group Work ▪ Simulated-based Design ▪ Electrical Engineering

Fourth year

First semester	Second semester
▪ Computational Fluid Dynamics ▪ Thermoflow ▪ Engineering Professionalism ▪ Practical Training **Option: Mechanical Engineering** ▪ Design Project ▪ Research Project **Option: Aeronautical Engineering** ▪ Design Project ▪ Research Project	**Option: Mechanical Engineering** ▪ Research Project ▪ Thermal and Fluid Machines ▪ Control Systems **One elective from the following:** ▪ Aeronautics ▪ Maintenance Engineering ▪ Nuclear Engineering ▪ Vehicle Engineering ▪ Mechatronics ▪ Heat and Mass Transfer ▪ Fossil Fuel Power Stations ▪ Numerical Methods ▪ Optimum Design ▪ Porous Flow **Option: Aeronautical Engineering** ▪ Research Project ▪ Thermal and Fluid Machines ▪ Control Systems **Elective module:** ▪ Aeronautics

I completed my BEng (Mechanical Engineering) degree in 2013 and am currently pursuing an MEng qualification specialising in control systems.

Throughout my undergraduate studies I have found that the EBIT Faculty is highly involved with their students and very well organised. The Department of Mechanical and Aeronautical Engineering at UP is definitely one of the best, if not the best, in the country. It provides students with world-class facilities and equipment on campus and in the laboratories, which certainly enhance the learning experience.

I received numerous awards at the end of my final year of study, including a shared award from Weir Minerals for the best student overall in the final year of mechanical and aeronautical engineering. One of the most valuable opportunities that I have received for my career was a bursary from the Council for Scientific and Industrial Research (CSIR). Working at the CSIR is expanding my understanding of the engineering industry, and I believe that my continued affiliation with the Council will allow me to make a significant contribution to the advancement of science and technology on a global scale.

I am extremely passionate about cars and my dream is to one day own a motorcar company that designs and manufactures supercars.

Mayur Tikam

School of Engineering

Department of Mining Engineering

BEng (Mining Engineering)

What does the study programme entail?

The profession of mining engineering encompasses a wide spectrum of engineering work – from mine evaluation to industrial control. For instance, mining engineers may undertake the evaluation of a new mining project as soon as the discovery and geological confirmation of a mineral deposit have been completed. If such a mineral deposit is found to be viable, mining engineers will design the mine to exploit the mineral deposit. Where the mineral deposit is close to the surface, an opencast mine will be preferred, but for deeper deposits, an underground mine will be planned. Mining engineers will coordinate the construction of such a mine and bring it to the stage where it starts producing.

A typical mine has a lifespan of 20 to perhaps 100 years. The design of the mining excavations, with their equipment and services, the planning of all the activities and the management of the operation at all levels is the responsibility of the mining engineer. This professional will also provide expert advice on rock breaking, blasting, materials transport systems, mine planning and scheduling, mechanical tunnel development, mine climate control, rock mechanics, support of excavations, devising mining methods, as well as the design and development of equipment.

Career opportunities

In addition to operational management, mining engineers are often involved in the planning and execution of research and development work. In order to maintain the proud position of the South African mining industry as a world leader, it is necessary to accept the challenges of technological development through extensive research and development programmes. Mining engineers fulfil the role of expert consulting engineers in various mining groups, as well as in private practice. Universities, government departments and financial institutions also employ mining engineers.

The mining industry is one of the largest industries in the country and certainly one of the most important. It supplies raw materials to a large variety of domestic industries, as well as energy minerals. On the other hand, precious metals, non-precious minerals, energy minerals and diamonds are exported to earn foreign exchange. More than 70 different minerals are currently produced in South Africa. They contribute directly to the gross domestic product. The mining

I am currently completing my honours degree in mining engineering and project management. This study programme has provided me with vast knowledge on aspects such as project management, operations, management and technical engineering skills, but most importantly, it has developed my problem-solving abilities – an essential skill for engineers.

Because the Department of Mining Engineering focuses on students' softs skills together with their technical skills, I could develop my leadership and managerial skills. A large number of departments are housed by the EBIT Faculty, which enables us to work together with students from other departments on some projects. This is valuable experience. Furthermore, the Community-based Project (JCP) Module gave me a chance to help other people.

The Department offers many opportunities to network with industry leaders through different societies and conferences, and I had the chance to meet mining professors from around the world at a recently held international conference for mining professors. It is also a great opportunity to work on my honours degree full-time while working as a teaching assistant in the Department of Mining Engineering.

I made the Dean's Merit List in 2010 and 2012, and received awards for the best student in Ventilation Engineering and Rock Mechanics. My final-year project was also selected as the best of the year group, and I was a member of the best mine design group.

My dream job is to be a professional project manager.

Theophelus Kagogo

School of Engineering

industry provides job opportunities to more than 400 000 people. Among these, there are obviously many employment opportunities for professionals. Currently, there is a global shortage of mining engineers.

Behind the scenes

The number of students in the Department has increased in recent years; however, classes are still relatively small. Therefore it is possible for staff to give intensive attention to individual students. A great number of technical visits offer students the opportunity to get acquainted with every aspect of the industry. A characteristic of the mining engineering study programme is that close group cohesion develops among students and continues long after graduation.

Take note: Prospective mining engineering students are advised to also check if they are medically compliant with the government requirements to work on a mine. Consult www.mohealth.co.za and www.dme.gov.za/pdfs/mhs/occupational_health/fitness_minimum_standards.pdf.

Contact information

Prof Ronny Webber-Youngman (Head of Department)
Tel +27 (0)12 420 3763
Fax +27 (0)12 420 4242
Email ronny.webber@eng.up.ac.za
Website www.up.ac.za/ebit

First year	
First semester	**Second semester**
▪ Graphical Communication ▪ General Chemistry ▪ Materials Science ▪ Calculus ▪ Humanities and Social Sciences 1	▪ Calculus ▪ Linear Algebra ▪ Electricity and Electronics ▪ Mechanics ▪ Physics ▪ Humanities and Social Sciences 2 ▪ Workshop Practice

Second year	
First semester	**Second semester**
▪ Dynamics ▪ Programming and Information Technology ▪ Calculus ▪ Differential Equations ▪ Strength of Materials ▪ Professional and Technical Communication ▪ Community-based Project	▪ Surveying ▪ Numerical Methods ▪ Engineering Statistics ▪ Thermodynamics ▪ Mathematics ▪ Experiential Training ▪ Community-based Project

Third year	
First semester	**Second semester**
▪ Surface Mining and Geotechnics ▪ Thermofluids ▪ Introduction to Geology 155 ▪ Minerals Processing ▪ Engineering Management ▪ Experiential Training ▪ Industrial Excursions	▪ Explosive Engineering ▪ Mineral Economics ▪ Engineering Activity and Group Work ▪ Mining ▪ Introduction to Project ▪ Historical Geology

Fourth year	
First semester	**Second semester**
▪ Mine Ventilation Engineering ▪ Mine Risk Management – Health and Safety ▪ Engineering Professionalism ▪ Strata Control ▪ Structural Geology ▪ Mining ▪ Industrial Excursions ▪ Practical Training	▪ Mine Design ▪ Ore Deposits ▪ Industrial Excursions ▪ Project

The Engineering Augmented Degree Programme (ENGAGE)

An engineering degree is very demanding. The workload is high, the pace is fast and the modules are academically challenging. Many students also face challenges regarding background knowledge in Mathematics and Physical Science, academic literacy and information technology, and may not have effective study skills to cope with the mainstream four-year programme. In addition, many students struggle with the transition to university life, with the very large first-year classes, freedom from strict discipline, and many social activities, even if they attended high-performing schools.

This is why the School of Engineering offers a five-year programme, called the Engineering Augmented Degree Programme (ENGAGE). ENGAGE is available in all the engineering disciplines. It provides a carefully structured curriculum that helps students adjust to university life and cope with the academic demands of engineering studies. In ENGAGE, the volume of work is gradually increased while the support provided is gradually decreased over a period of three years. However, the workload – the time students must spend on their studies – is high from the very beginning, so ENGAGE is not for students who do not want to work!

Structure of the study programme

In ENGAGE, students take all the first-year modules of the four-year degree programme in the same classes as the other students, but spread them out over a two-year period. In addition, for every 16-credit 100-level (first-year) module, students also take an eight-credit augmented module. For example, in the first semester students take the same Mathematics module (16 credits) as the four-year degree students, as well as Additional Mathematics (eight credits). In Additional Mathematics, students are divided into groups of about 50 and work on strengthening problem-solving and other cognitive skills, developing conceptual understanding and acquiring the background knowledge needed for the four-year Mathematics module.

School of Engineering

In the first year of study, ENGAGE students take the basic/natural sciences modules that form the foundation of engineering, namely Chemistry, Physics and Mathematics. Computer engineering students take Mechanics instead of Chemistry. ENGAGE students also take Professional Orientation, which provides an introduction to technology and information technology, as well as developing students' life skills, study skills and communication skills. All first-year students take a module in humanities and social sciences (HAS module).

In the second year, ENGAGE students take the introductory (100-level) engineering modules. For each engineering module, they also take a compulsory additional module. Second-year students also take one 200-level Mathematics module per semester. In the third year, students take the remaining 200-level modules, but since they have already taken two 200-level Mathematics modules, they have a slightly lighter load than the four-year programme students. ENGAGE students follow exactly the same programme as the four-year programme students for the last two years of their studies.

All the prescribed components of ENGAGE are compulsory. Attendance of all modules is also compulsory. The structure of the programme is summarised in the table below.

Four-year programme modules	Foundation modules
First year	
▪ 100-level Natural Science modules ▪ 100-level Humanities and Social Sciences	▪ Additional module for each Natural Science module ▪ Professional Orientation
Second year	
▪ 100-level Engineering modules ▪ 200-level Mathematics modules	▪ Additional module for each Engineering module
Third year	
▪ 200-level Engineering modules	▪ None
Fourth year	
▪ 300-level Engineering modules	▪ None
Fifth year	
▪ 400-level Engineering modules	▪ None

Who may register for ENGAGE?

Students may apply for ENGAGE if:

- their marks in the National Senior Certificate meet the admission requirements for the four-year study programme, but they would like more support; or
- their marks in the National Senior Certificate do not meet the requirements for entry into the four-year study programme, but do meet the requirements for the five-year study programme. These students will be required to write the National Benchmark Test (NBT).

Contact information

Dr Erika Müller (Acting Manager: Academic Development)
Tel +27 (0)12 420 4109
Fax +27 (0)12 420 4111
Email erika.muller@up.ac.za
Website www.up.ac.za/academic/engage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School for the Built Environment

Department of Architecture

The Department of Architecture presents programmes in architecture, interior architecture and landscape architecture. These study programmes focus on the design and realisation of space, and as such, complement one another in practice. They employ science and art in the creation of worthwhile environments for users. All three study programmes require innovators who can satisfy both the need for rational thought and the creative spirit. Designers are curious by nature and are interested in the way people inhabit spaces.

At the core of the curriculum is a studio-based culture, through which skills in design, theory, communication and management are developed. Projects completed in the studio are informed by subject modules covering diverse aspects such as construction, environmental design principles, history of the built environment and design communication. From the second year onwards, students gain programme specific knowledge. Students in the architecture programme focus on the theory of structures, whereas students in the interior and landscape programmes focus on material studies and plant sciences respectively.

The graduates of this Department are highly regarded, both locally and abroad. Through commitment to innovation and internationally recognised programmes in architecture, interior architecture and landscape architecture, the Department promotes a sustainable and prospering South African society.

BSc Architecture

Undergraduate (by coursework)	Minimum duration	Outcome (registration with SACAP)
BScArch At least one year of work or travel recommended.	Three years (full-time, studio-based)	Candidate architectural technologist
Postgraduate (by coursework)	**Minimum duration**	**Outcome**
BArchHons	One year (full-time, studio-based)	Candidate senior architectural technologist
MArch (Prof)	One year (full-time, studio-based)	Candidate architect

Architects design spaces and buildings to satisfy daily needs and improve the environment in which we live. They need abilities and skills that range from practical to artistic and from technical to theoretical. As professionals they conceptualise, design and document building projects and oversee quality control during construction. Architects are ethically and legally bound through institutes and government controlled councils, which protect the interests of the public. Architects can manage their own practices or work for other, often, multidisciplinary firms, or can make contributions to the government sector and education.

Accreditation

The programme in Architecture is validated by the South African Council for the Architectural Profession (SACAP) and recognised by the Commonwealth Association of Architects (CAA).

The one thing I value of the Department of Architecture is the dedication and care showed by our lecturers and fellow students. The sense of community in the EBIT Faculty is also noteworthy.

My dream is to run a multidisciplinary design studio.

Siyabonga Mahlangu

School for the Built Environment

BSc Interior Architecture

Undergraduate (by coursework)	Minimum duration	Outcome (registration with IID)
BScInt At least one year of work or travel recommended.	Three years (full-time, studio-based)	Candidate interior designer
Postgraduate (by coursework)	**Minimum duration**	**Outcome**
BIntHons	One year (full-time, studio-based)	Candidate senior interior designer
MInt (Prof)	One year (full-time, studio-based)	Candidate interior architect

The programme in interior architecture empowers students to design sustainable, meaningful and beautiful places within the context of architectural space. Graduates possess the theoretical and technical knowledge to engage critically with proposed or existing structures. Designers of interior environments shape the relationship between space, object and user. They follow a human-centred approach and perform spatial design and research services across various scales and typologies. Graduates work as designers in the built environment and related fields such as exhibition, lighting, product and stage design. The programme offers students the opportunity to become specialists in interior design within an interdisciplinary learning environment.

Accreditation

The programme in interior architecture is one of only five similar programmes in South Africa with educational membership at the International Federation of Interior Architects and Designers (IFI).

BSc Landscape Architecture

Undergraduate (by coursework)	Minimum duration	Outcome (registration with SACLAP)
BScLArch At least one year of work or travel recommended.	Three years (full-time, studio-based)	Candidate landscape architectural technologist
Postgraduate (by coursework)	**Minimum duration**	**Outcome**
BLHons	One year (full-time, studio-based)	Candidate landscape architectural technologist
ML (Prof)	One year (full-time, studio-based)	Candidate landscape architect

Landscapes are the represented expressions of the dynamic interaction between the technological and cultural activities of human societies within the physical environment. Landscape architecture is a profession and academic discipline concerned with the design of rural and urban outside spaces on various scales informed by this interaction. It considers change over time and mediates art and science, artefact and nature, city and region, and private and public interests. Landscape architects therefore synthesise knowledge from the humanities and the sciences to sustainably design meaningful and beautiful places that are grounded in material and immaterial culture, and ecology of their local contexts.

While completing my BSc undergraduate (2013) and honours degree in interior architecture (2014) at the Department of Architecture, I have had the opportunity to learn from a talented group of lecturers, students and independent designers. The diversity of projects covered throughout the study programme has helped me to grow as a designer and develop my potential and potential interests in the field of design.

Interior design is intimately involved with space, user and object, and I have learnt to not only see something aesthetically, but to also understand how it works and challenge it in order to devise a more plausible solution. The possibilities of "interior work" are endless I would like to be involved in rehabilitating and restoring spaces that have outlived their purpose. There is a beauty in things that are odd and imperfect, and this degree has enabled me to expand my appreciation for everyday things and the finer details that most often go unnoticed by many people.

Daniella Salgueiro

School for the Built Environment

Accreditation
The programme in landscape architecture is the only undergraduate degree course of its kind offered at a university in South Africa and is validated by the South African Council for the Landscape Architectural Profession (SACLAP). Locally there is a great demand for practitioners in both the public and private sector.

Admission by selection
A limited number of students are admitted to the Department annually. In view of the large number of applications received, prospective students who indicate architecture or interior architecture as their second choice are not considered for selection. Applicants who indicate landscape architecture as their second choice will, however, be considered for selection. All applicants are advised to consider other alternatives in the event of their applications being unsuccessful.

Meeting the minimum requirements does not guarantee admission to the study programme. Admission is granted on the basis of selection, which involves two rounds: In round 1, candidates are assessed on academic merit. Those who meet the minimum requirements for admission are invited to participate in round 2 by taking the departmental selection test. With the invitation, they also receive assignments to complete at home and submit on the day of the test. Candidates are assessed on their general knowledge and interests, abilities, motivation and experience.

The Department compiles a shortlist of final candidates based on the outcome of the tests and assignments. The candidates who have made the shortlist are invited to selection interviews, following which the final selection and waiting list placements are made. The decision of the Selection Committee is final and no discussion or correspondence will be entered into.

While candidates should preferably attend their tests and interviews, applicants who are unable to do so may request further selection material to be sent by mail. A telephonic interview may then be granted.

If the Grade 12 results of candidates who were provisionally selected do not meet the minimum requirements, final admission to the study programme may be withheld.

The minimum requirements for admission
The following matriculation subjects are required for admission: Mathematics, Physical Science (Physics and Chemistry) and either English or Afrikaans (the official languages of instruction at this University). Minimum achievement levels for these subjects apply (see below). Applicants who have not completed their Grade 12 studies yet must state their final Grade 11 results in their applications. These results will serve as the basis on which they will be considered during the first round of selection.

Applicants who matriculated before, or in 2007
The following minimum requirements for admission apply: A Grade 12 certificate with university endorsement and at least 40% (E symbol) in Mathematics and Physical Science on higher Grade, or at least 50% (D symbol) for the same subjects at standard Grade. A minimum M Score of 18 is required for Grade 12.

I love the South African landscape – to me there is no other that compares to the diversity and beauty we are so blessed to be surrounded by every day. For this very reason, I decided to study landscape architecture. At the Department of Architecture – the only department in the country that offers this as an undergraduate degree – we follow a multidisciplinary approach, which also includes architecture and interior architecture. This has enabled me to better shape my own design methodology and understand my role in this field.

In my final undergraduate year (2013), I received the GLSA Prize for the best landscape architecture student in the third-year Design module. During my second year (2012), I received the Urban Greening Project Book Prize for the implementation of my own design scheme. Being part of this project and the amazing culture in the Boukunde (Building Sciences) Building has made me realise how big an impact we can have on our environment and how important it is to be careful when doing so. Add creativity to the mix and you have my dream job – making the world a better and more beautiful place, one that will outlive generations to come!

Inadi Janse van Rensburg

School for the Built Environment

Applicants who matriculated in 2008 or thereafter

The following minimum requirements for admission apply: A National Senior Certificate with access to degree studies and a minimum Admission Point Score (APS) of 27; a minimum achievement level of 4 (at least 50%) for Mathematics and Physical Science; a minimum achievement level of 5 (at least 60%) for Afrikaans or English (as home language or first additional language) and an achievement level of at least 4 (minimum 50%) for Life Orientation, although this subject is not used in the calculation of the APS. The APS is calculated using two language subjects, Mathematics, Physical Science and any two other subjects excluding Life Orientation.

Please note: For the BScLArch study programme, Physical Science or Life Science or Geography will be accepted; the minimum achievement level remains a 4.

Transfers

Students currently enrolled for other study programmes may apply for permission to transfer to the Department of Architecture. For these applicants, round 1 of the selection process will be based on their Grade 12 results (refer to requirements for admission), their academic record and a detailed written motivation explaining reasons for wanting to transfer.

Students who are currently registered at UP should submit their applications directly to the Admissions Officer, School for the Built Environment. Students who are registered at other tertiary institutions must apply through the Client Service Centre. Note the closing date. Applicants will not be permitted to register for any modules in advance (prior to having been granted final admission).

Portfolios

Traditional portfolios (with art or technical drawings) are not required for selection. Applicants receive assignments (minor research projects and some simple freehand drawings) to prepare at home in their own time. This is followed by similar tasks during a selection test, where resources are not available and time is limited.

Incomplete applications

Please ensure that all supporting documents required, such as certified copies of identity documents, exemption certificates (for international applicants) and school results, are submitted before the closing date for applications, which is 30 June. It is candidates' responsibility to make the necessary arrangements in this regard. Incomplete applications cannot be considered for selection.

National Benchmark Test (NBT)

Although the Department of Architecture does not require of applicants to write the National Benchmark Test (NBT), applicants are advised to do so. In cases where selected students fail to maintain their Grade 11 results in Grade 12, and as a result no longer meet the minimum admission requirements, the NBT results may be considered.

In special cases the Admissions Officer will inform candidates of the arrangements. Candidates who also apply at other departments or institutions are advised to enquire if these tests are required elsewhere.

Important dates

The academic year of the University of Pretoria starts in January and ends early in December. It is divided into two semesters (or four quarter modules), with short recesses in April, July and September. In order to gain practical experience, students are advised to work at a practice during the University recesses. The University calendar is available online at www.up.ac.za/calendars.

1 March: Applications for admission open for the next academic year. Applications should be handed in at the Client Service Centre or can be submitted electronically.

30 June: Last day to submit all undergraduate applications for admission to the Department of Architecture for the following academic year. This closing date also applies to all transfer applications.

June/July/August/September: Departmental selection tests are written on scheduled Fridays or Saturdays. Dates are automatically allocated and cannot be rescheduled.

October recess: 3 October to 11 October 2015: Final selection interviews for applicants on the shortlist.

31 October: Selection results are available. Applicants are notified of the outcome in writing.

30 November: Last day for selected students to acknowledge their selection and pay deposits or make arrangements for payment.

School for the Built Environment

Contact information

The Department of Architecture does not deal with the administrative aspects of student affairs, such as applications, tuition fees, bursaries, and registration, study permits for international students or accommodation. Prospective students should address queries in this regard, as well as their applications for admission, to the Client Service Centre.

General enquiries and applications:
Prospective students
Client Service Centre
Tel +27 (0)12 420 3111
Email csc@up.ac.za

Enquiries about applications and selection
Ms Jenny van Rooyen (Admissions Officer)
School for the Built Environment
Level 6
Engineering Building 1
Tel +27 (0)12 420 5166
Fax +27 (0)12 420 4669
Email jenny.vanrooyen@up.ac.za

Academic enquiries:
Prospective students
Ms Elana van der Wath
(Department of Architecture)
Tel +27 (0)12 420 2182
Fax +27 (0)12 420 2552
Email arch@up.ac.za
Location Building Sciences Building
Hatfield Campus

Useful links
- University of Pretoria: www.up.ac.za. For a description of regulations, subject modules and syllabi, click the following link and select 'Built Environment': www.up.ac.za/yearbooks
- The South African Council for the Architectural Profession (SACAP): www.sacapsa.com
- The South African Institute of Architects (SAIA) www.saia.org.za
- International Federation of Interior Architects/Designers (IFI): www.ifiworld.org
- Institute of Landscape Architects of South Africa (ILASA): www.ilasa.co.za
- South African Council for the Landscape Architectural Profession (SACLAP): www.saclap.org.za

Department of Construction Economics

BSc Construction Management

What does the study programme entail?

Construction managers are business people who work as contractors, project managers and/or property experts in the built environment. The study programme focuses on the technical, financial and managerial aspects of construction. The construction manager can add value to almost any building-related activity. In the three-year programme, some financial and managerial aspects are touched on, but the main focus is on the technical aspects.

During the one-year honours degree following the BSc degree, students receive further training in aspects such as financial management, project management and strategic management. The details of the study programme show how diverse the discipline really is. Students who study for a pure BCom or LLB degree are often surprised at the construction manager's insight into their disciplines.

Career opportunities

Construction managers will almost always find employment locally and internationally, irrespective of economic cycles. The Royal Institution of Chartered Surveyors (RICS) and the Chartered Institute of Building (CIOB) accredit the programme internationally. In terms of legislation, it is now possible to achieve professional status by registering with the South African Council for the Project and Construction Management Professions (SACPCMP). Registration is possible in the professional construction manager and professional construction project manager categories.

On successful completion of the three-year study programme, students can enter a career in construction management or subcontract and main contract work, to mention a few possibilities. On successful completion of the one-year honours degree, opportunities become far wider, with project management, property development, portfolio management, commercial marketing and managerial positions in the corporate environment as some possibilities. Construction managers are entrepreneurs and often create their own work, even outside the built environment.

How long does this study programme take to complete?

The BSc Construction Management study programme takes three years to complete, and the honours degree a further year. During the honours degree, students are expected to work at approved construction firms on a part-time basis in order to supplement their theoretical studies with hands-on practical experience.

Selection process

Only a limited number of candidates can be accommodated and admission is subject to selection.

Behind the scenes

One of the aspects that make the study programme unique is the fact that all the lecturers remain actively involved in practice. This ensures that theory can always be combined with practical experience. Furthermore, lecturers serve on various professional councils and make a real contribution to the development of the field of study. Practitioners and employers rate UP students highly and there is continuous close liaison between the Department and industry.

Contact information

Mr Derick Booyens (Programme Leader: Construction Management)
Tel +27 (0)12 420 4433
Fax +27 (0)12 420 3598
Email derick.booyens@up.ac.za

School for the Built Environment

First year	
First semester	**Second semester**
▪ Building Drawings ▪ Building Science ▪ Academic Information Management ▪ Academic Literacy ▪ Building Services ▪ Quantities ▪ Introduction to Structures ▪ Statistics ▪ Precalculus	▪ Building Organisation ▪ Building Drawings ▪ Building Science ▪ Building Services ▪ Quantities ▪ History of the Environment ▪ Structures ▪ Statistics

Second year	
First semester	**Second semester**
▪ Labour Law ▪ Building Science ▪ Economics ▪ Financial Management ▪ Building Services ▪ Construction Quantities ▪ Reinforced Concrete Structures ▪ Site Surveying	▪ Building Science ▪ Economics ▪ Financial Management ▪ Building Services ▪ Construction Quantities ▪ History of the Environment ▪ Civil Engineering Services

Third year	
First semester	**Second semester**
▪ Business Law ▪ Building Science ▪ Building Services ▪ Construction Management ▪ Construction Information Technology and Communication ▪ Construction Quantities ▪ Community-based Project	▪ Housing ▪ Building Science ▪ Introduction to Property Law ▪ Sustainable Construction ▪ Construction Management ▪ Research Methodology ▪ Construction Quantities ▪ Property Financial Mathematics ▪ Community-based Project

BSc Quantity Surveying

What does the study programme entail?

Quantity surveyors provide specialised financial and contractual services and advice to clients in the construction industry, as well as in other related industries. The quantity surveyor is an independent, professional consultant who acts in cooperation with, among others, architects, consulting engineers and contractors to promote the interests of the building client.

Career opportunities

There are various job opportunities in the construction industry. Most quantity surveyors find their way to the private sector, where they are employed at quantity surveying practices or, after registration with the South African Council for the Quantity Surveying Profession (SACQSP), they may become partners or directors or they could start their own professional practices. Quantity surveyors also act as project managers and valuers. Various government departments employ quantity surveyors, and opportunities in the property sector, banking, engineering and manufacturing industries are further career options. A number of quantity surveyors, however, also work for construction firms or establish their own building enterprises and construction companies.

How long does this study programme take to complete?

BSc Quantity Surveying: After three years of successful study, students receive a BScQS degree. They will be able to become involved in the field of quantity surveying and support professional quantity surveyors with all types of construction work, particularly buildings and infrastructure.

BScHons Quantity Surveying: After a further two years of successful study, students will receive a BScHonsQS degree. They will then be qualified to start a professional quantity surveying career in the construction industry and related industries. In terms of current legislation, they may, after submitting proof of prescribed professional practical experience and successful completion of an assessment of professional competence, register with the South African Council for the Quantity Surveying Profession. During the honours degree, students are expected to work at approved quantity surveying firms when not attending lectures in order to supplement their theoretical studies with hands-on practical experience.

Selection process

Only a limited number of candidates can be accommodated and admission is subject to selection.

Behind the scenes

These qualifications are recognised nationally and internationally and have been accredited by the South African Council for the Quantity Surveying Profession and the Royal Institution of Chartered Surveyors (RICS). The RICS (United Kingdom) undertakes international accreditation and has members and mutual recognition agreements worldwide. Hence, the three-year degree and two-year honours degrees enjoy international recognition.

The Department is exceptionally well equipped for students who are interested in furthering their studies. Master's degree courses by coursework with specialisation in various disciplines are offered. A master's degree may also be obtained by way of a treatise and an oral examination. MBA and MBL degrees are popular postgraduate fields of study that may be pursued at numerous local universities and internationally. A doctorate can be obtained by submitting a thesis and passing an oral examination.

Contact information

Mr Danie Hoffman (Programme Leader: Quantity Surveying)
Tel +27 (0)12 420 2551
Fax +27 (0)12 420 3598
Email danie.hoffman@up.ac.za

First year	
First semester	**Second semester**
▪ Building Drawings ▪ Building Science ▪ Academic Information Management ▪ Academic Literacy ▪ Building Services ▪ Quantities ▪ Introduction to Structures ▪ Statistics ▪ Precalculus	▪ Building Organisation ▪ Building Science ▪ Building Services ▪ Quantities ▪ History of the Environment ▪ Structures ▪ Statistics ▪ Building Drawings

Second year	
First semester	**Second semester**
▪ Building Science ▪ Economics ▪ Financial Management ▪ Building Services ▪ Quantities ▪ Site Surveying ▪ Reinforced Concrete Structures	▪ Building Science ▪ Economics ▪ Financial Management ▪ Building Services ▪ Quantities ▪ History of the Environment ▪ Civil Engineering Services

I completed my BSc Quantity Surveying with distinction at the end of 2013 and I am currently completing my honours degree in quantity surveying. I particularly enjoy this field of study, as it provides me with solid knowledge of various aspects of the built environment. Because the Department of Construction Economics is so small, we have good relationships with our lecturers, which creates a healthy learning environment and an enhanced learning experience. Every lecturer is an expert in his or her field and generously shares the knowledge and experience he or she has acquired over the years. As graduates of the EBIT Faculty, we are equipped with the necessary skills to enter the professional world.

The Department of Construction Economics has provided me with the opportunity to visit a substantial number of construction sites, to interact with various qualified and recognised people in the built environment, and to attend lectures, seminars and presentations by renowned guest speakers.

I was privileged to attend a course presented by the Green Building Council of South Africa, and I have completed the examination. I am now recognised as a Green Star South African Accredited Professional for New Buildings.

In my first year of study in 2011, I received an Achievement Award and a JuniorTukkie bursary, which subsidised the major part of my tuition fees. In my second year, I was selected as a member of the Golden Key International Honour Society, and I also received an achievement award and the second prize for BSc Quantity Surveying. I graduated with distinction and received the award for the best quantity surveying student in the final year, as well as the award for the best average in Quantities over the three years of study.

My dream job is to be a heading my own company or being a director in one of the big listed companies.

Maseeha Patel

School for the Built Environment

Third year	
First semester	**Second semester**
▪ Business Law ▪ Quantity Surveying Practice ▪ Building Science ▪ Building Services ▪ Quantities ▪ Construction Information Technology and Communication ▪ Community-based Project	▪ Housing ▪ Quantity Surveying Practice ▪ Building Science ▪ Introduction to Property Law ▪ Sustainable Construction ▪ Quantities ▪ Research Methodology ▪ Property Financial Mathematics ▪ Community-based Project

BSc Real Estate

What does the study programme entail?
Real estate is the study of fixed property and related aspects such as property economics, development, management, valuation, financing, investment and marketing.

Career opportunities
Apart from a future in areas such as property investment, property finance and facilities management, further studies to obtain an honours degree in real estate can lead to registration as a professional property valuer. Career opportunities encompass the whole spectrum of the property sector, whether as entrepreneurs in the private sector or as employees in the private, government or semi-governmental sectors.

How long does this study programme take to complete?
The BSc Real Estate study programme takes three years to complete, and the honours degree a further year.

Selection process
Only a limited number of candidates can be accommodated and admission is subject to selection.

Behind the scenes
Real estate (or property studies) has developed into a specialised field requiring unique expertise. The contribution of professionally trained property practitioners is important to achieve the present socio-political development priorities in South Africa (privatisation of government assets and outsourcing of management functions, redistribution of land and development of low-cost housing). The study programme also offers ample opportunity for community service and research.

I am currently completing my BScHons Real Estate degree at the Department of Construction Economics. The Department, together with the entire EBIT Faculty, supports its students and allows them to excel by providing quality industry knowledge from lecturers who understand the industry.

This degree equips me with knowledge of all the aspects of fixed property, from the conceptual and design phase, all the way through to the management of fixed property after construction. The country has a shortage of property specialists, and this degree provides something different and is highly regarded by professionals in the industry.

The study programme allows us to interact with other students from related fields, such as construction management, quantity surveying, and town and regional planning. This is excellent preparation for teamwork in the industry.

I was fortunate enough to have internships at overseas organisations in the property sector. The first one was at OAI, a facilities management company based in Washington. The other one was at VAMED, an Austrian company that develops hospitals and manages their facilities. These two opportunities allowed me to broaden my knowledge base and use the theoretical knowledge I learnt in the lecture halls in the real world. In addition to the actual knowledge I gained from working at these two companies, I was able to become more open-minded by seeing how people live and do things differently in other parts of the world.

Africa is filled with great potential. My dream job is to start my own property development company to explore the multitude of development opportunities on the African continent.

Lerato Litlhakanyane

School for the Built Environment

The number of persons working in the various components of the property industry in South Africa runs into tens of thousands. The property sector forms an appreciable part of the South African economy – in fact, real estate comprises about 40% to 50% of the world's total assets.

Contact information

Dr Douw Boshoff (Programme Leader: Real Estate)
Tel +27 (0)12 420 3781
Fax +27 (0)12 420 3598
Email douw.boshoff@up.ac.za

First year	
First semester	**Second semester**
▪ Building Drawings ▪ Building Science ▪ Academic Information Management ▪ Academic Literacy ▪ Building Services ▪ Quantities ▪ Economics ▪ Real Estate ▪ Precalculus	▪ Building Organisation ▪ Building Drawings ▪ Building Science ▪ Building Services ▪ Quantities ▪ History of the Environment ▪ Economics ▪ Real Estate

Second year	
First semester	**Second semester**
▪ Building Science ▪ Statistics ▪ Financial Management ▪ Building Services ▪ Property Valuation ▪ Real Estate ▪ Social Research: Introductory methodology	▪ Building Science ▪ Statistics ▪ Financial Management ▪ Building Services ▪ History of the Environment ▪ Civil Engineering Services ▪ Real Estate ▪ Property Valuation

Third year	
First semester	**Second semester**
▪ Business Law ▪ Building Science ▪ Building Services ▪ Property Valuation ▪ Real Estate ▪ Community-based Project	▪ Housing ▪ Building Science ▪ Introduction to Property Law ▪ Sustainable Construction ▪ Property Valuation ▪ Real Estate ▪ Property Financial Mathematics ▪ Research Methodology ▪ Community-based Project

Department of Town and Regional Planning

BT&RP – Bachelor of Town and Regional Planning

What does the study programme entail?

Town and regional planning is a profession that promotes and manages change through the planning, design, implementation and management of public interventions in the development and use of land. These interventions can vary from site level to supranational level and aim at widening choice, promoting equity, ensuring sustainable human settlements and improving the quality of people's lives. The guiding motive of the profession is the generation of viable alternatives to existing settlement types.

At the current juncture in South Africa's history, town and regional planning is a key profession in the rectification of the spatial and other imbalances in both urban and rural areas, as well as the improvement of inefficient and underperforming living environments. The challenge for planning lies in the fact that different interests and expectations for the future are often contradictory and conflict-ridden. A professional approach that combines sensitivity and analytical and strategic skills is hence required to handle the various political, social, environmental and economic issues at stake.

The ideal town and regional planner is a creative person who is able to put forward innovative solutions to complex problems, a mediator who is able to reconcile diverse points of view, a strategic thinker and a good manager. Given the enormous backlog in the fields of housing and social services, and the poverty in which many South Africans live, planners also need a strongly developed sense of social and environmental justice and should be committed to human development.

Career opportunities

While most town and regional planners act as private consultants to the public and the private sector, they are also employed by all three spheres of government, research agencies such as the Council for Scientific and Industrial Research and the Human Sciences Research Council, non-governmental and development organisations, community-based organisations, major financial institutions and property development groups. The qualification will enable graduates to register as professional town and regional planners with the South African Council for Town and Regional Planners, which is an official body established in terms of an act of Parliament. The degree is internationally recognised.

How long does this study programme take to complete?

The minimum period of study is four years' full-time study.

Selection process

Only a limited number of candidates can be accommodated and admission is subject to selection.

Behind the scenes

Practice and theory are integrated in the various modules. Lectures, project and studio work focus on stimulating critical thought, engaging students in discussion, and applying theory by means of practical problem-solving exercises. Instruction is student-centred and attention is given to the progress of individual students. One of the trademarks of this Department is a desire to take on new challenges, and the Department is involved in and committed to community development in South Africa. The latter takes place mainly through research and contract work for a range of clients in all three spheres of government.

Study programme

The study programme in town and regional planning equips the planner with the necessary knowledge and skills to present interventions to manifold problems in settlements and regions, by focusing on the following themes: planning theory and history, land-use management and land development, settlement planning and design, strategic and integrated development planning, urban and rural regeneration, and planning methods and techniques.
A number of modules in related fields are also prescribed to ensure that students acquire a multidisciplinary perspective and the knowledge base required to provide appropriate solutions for complex urban and rural problems.

School for the Built Environment

Contact information
Prof Mark Oranje (Head of Department)
Tel +27 (0)12 420 3535
Fax +27 (0)12 420 3537
Email mark.oranje@up.ac.za
Website www.up.ac.za/townplanning

First year	
First semester	**Second semester**
▪ Planning and Settlement Histories before the Industrial Revolution ▪ Site Analysis and Assessment ▪ Introduction to Planning ▪ Academic Literacy ▪ Academic Information Management ▪ Economics ▪ Statistics ▪ Sociology	▪ Planning and Settlement Histories since the Industrial Revolution ▪ Settlement Analysis and Assessment ▪ Principles of Settlement Design ▪ Academic Literacy ▪ Economics ▪ Statistics ▪ Sociology

Second year	
First semester	**Second semester**
▪ Settlement Design Concepts ▪ Introduction to Development Planning ▪ Plan and Policy Analysis and Assessment ▪ Land-use Management Theory ▪ Sociology or Economics ▪ Community-based Project	▪ Settlement Establishment and Housing Delivery ▪ Municipal Development Planning ▪ Land-use Management Practice ▪ Urban Land Development Economics ▪ Sociology or Economics ▪ Community-based Project

Third year	
First semester	**Second semester**
▪ Regional Development Planning ▪ Institutional and Legal Structures for Planning ▪ Spatial Concepts ▪ Sociology or Economics	▪ Rural Development Planning ▪ Planning Prospects ▪ Transport Planning and Municipal Services Provision ▪ Sociology or Economics

Fourth year	
First semester	**Second semester**
▪ Planning Interventions: Peri-urban and Rural Scales ▪ Planning Interventions: Supranational, National and Regional Scale ▪ Research Methodology ▪ Professional Practice	▪ Planning Interventions: Metropolitan Scale ▪ Planning Interventions: Urban Scale ▪ Research Report ▪ Practical Development Feasibility

I am currently studying towards my master's degree in Town and Regional Planning. During my four years of study at the Department of Town and Regional Planning, I have come to learn that this field is ideally suited to strategic thinkers and creative, yet practical, visionaries. The experienced and helpful staff enable students to grow into people with these skills.

The study programme helped me to cure me from my dislike of reading, and to overcome my fear of speaking in front of people. It also allowed me to develop an analytical approach to problems and a creative approach to solutions.

Completing this degree with honours enabled me to present my research dissertation at the 6th Annual Planning Africa Conference in Durban in 2014. It also enabled me to write my first accredited article and to pursue postgraduate studies. Ultimately, this degree and the achievements that came with it enabled me to complete my candidacy at one of the best town planning and urban design firms in the sector and to work on ground-breaking and life-changing projects.

Apart from the honorary colours I received from the University of Pretoria for representing South Africa and winning four medals in lifesaving at the Royal Lifesaving Society's Commonwealth Games in Edmonton, Canada, I have a number of academic achievements. During my studies I was selected to become a member of the Golden Key International Honour Society. In the first three years of the programme, I was ranked in the top three of my class, while I was ranked first in my class in my final year. I was awarded the Plan Associates book prize for the best dissertation by a fourth-year student.

Ideally I would like to do part-time research and part-time private work. Private work would ideally comprise spatial and strategic planning, with a hint of urban management, and my research will ideally be focused on decision-making and implementation.

Renier Oosthuizen


talk
wikitude

School of Information Technology

Department of Informatics

BIT – Bachelor of Information Technology

This exciting study programme is the first of its kind in South Africa and integrates, in a four-year study programme, the different disciplines related to information technology. Many people have a desire to be professionally prepared for a career in the IT industry as a whole, rather than becoming an expert in a particular field of study. The School therefore designed the study programme with the explicit aim of ensuring that students have grounding in all aspects deemed to be a necessary part of the background of the IT professional. The fourth study year includes a six-month learnership with participating organisations where students are employed as trainees.

Due to its nature, the curriculum is tightly prescribed, with relatively few options open to students. This ensures that the group of BIT students has a cohesive team spirit, and a shared ideal and vision. The curriculum is not for the faint-hearted and requires hard work and dedication. On successful completion, BIT graduates can continue with the part-time MIT study programme or any other master's degree in the School of Information Technology to complete their professional training.

What does the study programme entail?

The study programme prepares students to understand the use of IT in organisations. In particular, skills are developed to program on both a small and large scale, and to design and implement IT solutions for organisations in a professional manner. Students learn about the use of information in organisations, and how to organise and retrieve information optimally. Sound communication skills and general problem-solving skills are developed throughout the study programme. This is underpinned by language and quantitative mathematical studies and the development of penetrating thinking abilities through a course in philosophy. The final-year learnership introduces students to the working world, and ensures their smooth transition to a professional work life after graduation.

I completed a Bachelor of Information Technology in the EBIT Faculty. What I loved about my degree was that it combined computer science, information science and informatics. My degree was four years in length and included an honours degree, which was very beneficial when applying for jobs. I did graduate in April 2014 with distinction. The departments I liked the most was Information Science and Informatics, because they gave us the opportunity to develop critical thinking skills, and taught us how we should always ask questions to clarify what is expected of us. This has played a major role in preparing me for the IT industry.

When I was in matric, the EBIT Faculty gave me the opportunity to attend the July EBIT Week, which exposes one to all the different IT and engineering degrees EBIT offers. This helped me make my decision to enrol for the Bachelor of Information Technology. I suggest that all prospective IT students take part in this week if they are unsure about which study programme to take. The ladies at EBIT Student Administration are friendly and willing to help whenever you have a problem relating to your registration and module registration. Finally, the EBIT career shows helped me to see which industries are interested in hiring IT students and what they expect from their employees. It really helped me to prepare for interviews!

I received an Investec IT bursary for my fourth year of study. In my third study year, I obtained third place for my INF370 year project, and in my final year, I was the second-best fourth-year Bachelor of Information Technology student.

My dream job is to work for Investec, which I am currently doing. I would like to continue learning and developing my professional and personal skills sets. Investec satisfies all these requirements to be my dream job. The ultimate for me will be to become the head of an IT department and/or possibly the chief information officer of a major corporation!

Carmen Lammerding

School of Information Technology

Career opportunities

The goal of the study programme is to produce well-rounded information technologists who have knowledge and understanding of the following:

- the theory and practice of programming and software engineering
- the theory and practice of the adoption and use of information systems in business organisations
- aspects of collecting, retrieving, organising, managing and using information
- philosophy, language and mathematics

How long does this study programme take to complete?

The BIT study programme takes a minimum of four years to complete.

Contact information

Prof M Matthee (Program Leader)
Tel +27 (0) 12 420 3365
Fax +27 (0) 12 362 5287
Email b.it@up.ac.za
Website http://sit.up.ac.za

BCom (Informatics)

What does the study programme entail?

BCom (Informatics) studies the application and use of the computer and information systems in the organisation. The superiority of students in this field lies in their broad background in the field of economic and management sciences, which implies that the world of business is not strange to them. The use of information technology by organisations is growing exponentially and new, more complex and challenging applications are explored and developed on a daily basis. It has the benefit that, in addition to the obvious fact that the work environment of the informatics specialist is particularly interesting, there is also the advantage that many job opportunities are available to well-qualified informatics specialists.

Informatics specialists have the knowledge to analyse the information needs of organisations, be it businesses, government departments, non-profit organisations or any other organisation where information is crucial. They not only analyse the needs, but also address those needs by designing and implementing information systems. Information systems nowadays refer to computer-based systems (including mobile applications) that store and manipulate data so that people can understand, use, interpret and make decisions based on the information.

The BCom (Informatics) degree offered by the University of Pretoria is the only degree in South Africa that is internationally accredited by the Accreditation Board for Engineering and Technology (ABET) of the USA.

Contact information

Department of Informatics
Tel +27 (0)12 420 3798
Email informatics@up.ac.za
Website http://informatics.up.ac.za

First year

First semester and second semester

Compulsory modules	Elective modules (Choose one*)
▪ Computer and Information Literacy ▪ Academic Literacy Levels ▪ Informatics ▪ Financial Accounting ▪ Economics ▪ Statistics ▪ Communication Management ▪ English ▪ Business Management ▪ Discrete Structures	▪ Marketing Management ▪ Communication Management * Only if one of these modules are chosen as an elective at second- and third-year level.

Second year

First semester and second semester

Compulsory modules	Elective modules (Choose one)
▪ Business Ethics ▪ Informatics ▪ Business Law ▪ Community-based Project	▪ Business Management ▪ Financial Accounting ▪ Financial Management ▪ Taxation ▪ Statistics ▪ Internal Auditing ▪ Communication Management ▪ Marketing Management ▪ Community-based Project

Third year

First semester and second semester

Compulsory module	Elective modules (Choose one)
▪ Informatics	▪ Business Management ▪ Financial Accounting ▪ Statistics ▪ Internal Auditing ▪ Communication Management ▪ Marketing Management

Department of Computer Science

BSc (Computer Science)

BSc (Computer Science) is the ideal study programme for students who are curious about how computers work, enjoy building things in a careful and systematic fashion, have a logical mind, are good at reasoning in a step-by-step way, find it fun to design things that others can use, are able to pay attention to detail, recognise good style when they see it and keep working at a task until they succeed.

A BSc (Computer Science) degree from the University of Pretoria provides breadth and depth in computing skills. It equips students with problem-solving abilities, and gives them a foundation for continued learning in an IT career and for producing high-quality software.

What does the study programme entail?

The BSc (Computer Science) degree can be completed in a minimum of three years. The curriculum conforms to the highest international standards and will give students a foundation in all the important areas of computer science. Students will study a rich variety of computer science courses that emphasise the most up-to-date ways of developing software to be used in the IT industry. In addition, this study programme includes a significant number of courses in Mathematics and Physical Science. These courses strengthen the kind of thinking done when one develops software and

School of Information Technology

enhances problem-solving abilities. It also provides a basis for research in computer science, which often relies on a certain level of mathematical skill and maturity.

Career opportunities

A BSc (Computer Science) degree will enable graduates to write software in a variety of contexts. As a result, they will be able to find employment in diverse environments in many different IT organisations. They could stay active at a technical level if they wanted to, or they could work towards playing a managerial role in the IT industry. Alternatively, if they have entrepreneurial skills, they could start their own consultancy company, as several graduates have already done. In all cases, opportunities abound and salaries are highly competitive.

Contact information

Prof Andries Engelbrecht (Head of Department)
Tel +27 (0)12 420 2361
Fax +27 (0)12 362 5188
Email engel@cs.up.ac.za
Website www.cs.up.ac.za

Dr Linda Marshall (Undergraduate Advisor)
Email lmarshall@cs.up.ac.za

First year

First semester and second semester

- Academic Information Management
- Academic Literacy for IT

Computer Science
- Program Design
- Computers and Algorithms
- Software Modelling

Mathematics
- Calculus
- Discrete Structures
- Algebra

Specified courses from:
- Information Science
- Mathematical Sciences
- Statistics
- Physical and Biological Sciences
- Humanities or Economic and Management Sciences

Second year

First semester and second semester

Computer Science
- Computer Architecture
- Data Structures and Algorithms
- Netcentric Computer Systems
- Operating Systems
- Concurrent Systems

Mathematics
- Discrete Structures
- Mathematical Modelling

Informatics and Information Science

Community-based Project

Specified courses from:
- Information Science
- Mathematical Sciences
- Chemistry
- Physics
- Mathematical Statistics

Third year

First semester and second semester

Computer Science
- Software Engineering
- Computer Security and Ethics
- Computer Networks
- Programming Languages

Specified courses from:
- Computer Science
- Information Science
- Mathematics
- Mathematical Statistics
- Physics
- Chemistry

I am currently completing my BScHons Computer Science. The BSc Computer Science degree has equipped me with analysis and problem-solving skills, as well as fundamental theoretical and practical knowledge about different aspects of computer science. I believe that a foundation has been established for me to apply this knowledge to new situations in my future career.

I enjoy being surrounded by the innovative and creative people in the Department of Computer Science. My final-year project gave me the opportunity to observe the practical application of software in a business environment and how software can add value to a business.

I am a member of the Golden Key International Honour Society, and was one of the top second- and-third year students in computer science.

My dream job is one that continuously provides new challenges and requires creative problem-solving. I would like to work on projects that expose me to different industries.

Madene Marais

School of Information Technology

BSc IT (Information and Knowledge Systems)

BSc IT (Information and Knowledge Systems) is the ideal study programme for students who are interested in computer science, as well as in one of the following study subjects: Applied Mathematics, Genetics, Geographical Information Systems, IT and Business Management, Law, Music, Philosophy, Operational Research, Psychology and Software Development.

What does the study programme entail?

The BSc IT (Information and Knowledge Systems) study programme can be completed in a minimum of three years. It aims to prepare students for pursuing a career in the IT industry. By enabling students to take a second major other than computer science, students are provided with a wider background. Computer science has a multidisciplinary application domain and the purpose of the study programme is reflected in the composition of the curriculum by combining the field of computer science with other fields of study.

Career possibilities

Graduates with a BSc IT (Information and Knowledge Systems) degree are highly sought after in the IT industry. The focus of the degree is based on industry-related trends. The combination of computer science with other subjects delivers graduates who can successfully satisfy the needs of industry. The application environments that students can choose from provide them with a wider range of job opportunities.

Possible careers include:

- Applied Mathematics: computational financial modelling, financial data mining and analysis, financial programming, and numerical and risk analysis.
- Genetics: programming models of genes and administration of biological data.
- Geographical Information Systems (GIS): GIS consultation, environmental analysis for national, provincial and municipal governments, and town and regional planning applications.
- IT and Enterprises: IT business analysis and consultation and IT entrepreneurial consultation.
- IT and Law: expert witness in IT-related court cases, consultation on IT-related laws, computer and security consultation, and forensic investigations.
- IT and Music: electronic music analysis, programming of music devices and drivers, digital storytelling and advertising.
- Operational Research: mathematical modelling and optimisation, and numerical and empirical analysis.
- Philosophy: computer ethics, professional responsibility, and potential for computer science research.
- Psychology: forensic psychology, profiling, expert testimony in court cases, and behavioural analysis.
- Software Development: database design and development, human-computer interface design, and programming in many environments.

Contact information

Prof Andries Engelbrecht (Head of Department)
Tel +27 (0)12 420 2361
Fax +27 (0)12 362 5188
Email engel@cs.up.ac.za
Website www.cs.up.ac.za

Dr Linda Marshall (Undergraduate Advisor)
Email lmarshall@cs.up.ac.za

The Faculty of Engineering, Built Environment and Information Technology (EBIT) provides students with the opportunity to broaden their knowledge and skills in a vibrant and supportive environment. This helps to establish a platform on which one can build a successful career.

I completed my BSc IT degree in 2013 and I am currently studying for my honours degree in computer science. I have received various awards throughout my years of study, including the Real IRM Solutions Award for the best Visual C# project and the UP Award for the best BSc IT student (2013). I have also been selected as a member of the Golden Key International Honour Society.

Because I studied at EBIT, various software development companies approached me, offering career opportunities and internships. This degree has given me the necessary tools and confidence to seize these opportunities.

My dream job would be to be a developer for an international software development company that creates innovative solutions to new problems.

Ilicia Jordaan

School of Information Technology

First year

First semester and second semester

- Academic Information Management
- Academic Literacy for IT

Computer Science
- Program Design
- Computers and Algorithms
- Software Modelling

Mathematics
- Calculus
- Discrete Structures

Second year

First semester and second semester

Computer Science
- Computer Architecture
- Data Structures and Algorithms
- Netsentric Computer Systems
- Operating Systems
- Concurrent Systems

Community-based Project

Mathematics
- Discrete Structures

Informatics and Information Science

Community-based Project

Third year

First semester and second semester

Computer Science
- Software Engineering
- Computer Security and Ethics
- Computer Networks
- Programming Languages

Information Science
- Human-computer Interaction

Additional modules as needed for the application environment options at first-, second- and third-year levels from one of the following fields:
- Applied Mathematics
- Genetics
- Geographical Information Systems
- IT and Business Management
- IT and Law
- IT and Music
- Operational Research
- Philosophy
- Psychology
- Software Development

Department of Information Science

BIS (Multimedia)

BIS (Multimedia) is the ideal study programme for students who like to work with computers, like programming for multiple platforms, are interested in creating computer games, want to do web design and development, and want to learn how to do animation and image, audio and video editing.

What does the study programme entail?
Information can be communicated through various media, such as printed text, text with images, photographs, video, sound and animation. Such information can be delivered in many different ways: from a network-based technology

I enjoyed the BIS Multimedia degree because of the wide variety of subjects that allowed me to gain experience in all the fields in which I am interested. In addition, the lecturers in the Department of Information Science are excellent.

I was given the opportunity to compete in the Microsoft Imagine Cup in 2014 after my team was placed first in the Multimedia Game Expo at the University of Pretoria. This was a valuable experience, as I was exposed to a very high level of competition, and gained insight into what is needed to succeed in game development at a professional level.

At the School of Information Technology's prize-giving and at my graduation in 2014, I received the Intecon prize for the highest cumulative average over a three-year undergraduate degree in the School, as well as the award for the best third-year BIS Multimedia student. I also received the Vice-Chancellor and Principal's medal for excellent undergraduate achievement, and was awarded the National Research Foundation (NRF) Freestanding Honours Scholarship for 2014.

My dream is to become involved in the video game development industry.

Jason de Andrade

School of Information Technology

(such as the web and its many devices, ranging from personal computers to mobile devices). Information can thus be delivered in many different (read: "multi") media. The goal of the multimedia degree is to provide students with the theoretical and technical know-how to build information products that use a variety of media and delivery systems.

Career possibilities

With the advent of all kinds of new devices that enable connection with information sources such as the web, there is a global shortage of content producers. The BIS (Multimedia) study programme prepares graduates to get jobs with any of these dynamic content producers.

They could also become hard-core coders and work for programming companies, or become skilled in their particular areas of interest: digital music or video, programming, graphic development, games development or web development. They could work in industries such as telecommunications, broadcasting, publishing and internet content provision; in fact, at any institution that communicates information in multimedia.

Contact information

Prof Theo Bothma (Head of Department)
Tel +27 (0)12 420 2961
Fax +27 (0)12 362 5181
Email infosci@up.ac.za
Website http://is.up.ac.za

First year

First semester	Second semester
Fundamental modules ▪ Academic Information Management ▪ Academic Literacy Levels	**Fundamental modules** ▪ Academic Literacy Levels
Core modules ▪ Information Science ▪ Introduction to Information Science	**Core modules** ▪ Information Science ▪ Organisation and Representation of Information ▪ Information and Communication Technology
Multimedia ▪ Mark-up Languages	**Multimedia** ▪ Multimedia for the Web
Computer Science ▪ Imperative Programming ▪ Introduction to Computer Science	**Computer Science** ▪ Introduction to Program Design ▪ Software Modelling
Other compulsory module ▪ Visual Design	**Other compulsory modules** ▪ Visual Design ▪ Computer Architecture

Second year

First semester	Second semester
Fundamental module ▪ Community-based Project	**Fundamental module** ▪ Community-based Project
Core modules ▪ Multimedia ▪ Advanced Mark-up Languages I ▪ Multimedia and Hypermedia Theory	**Core modules** ▪ Multimedia ▪ Advanced Mark-up Languages II
Publishing ▪ Copy-editing	
Computer Science ▪ Data Structures and Algorithms ▪ Netcentric Computer Systems	**Computer Science** ▪ Operating Systems ▪ Concurrent Systems
Other compulsory module ▪ Visual Design	**Other compulsory module** ▪ Visual Design

Third year

First semester	Second semester
Core modules ▪ Multimedia ▪ Multimedia Project ▪ Human-computer Interaction	**Core modules** ▪ Multimedia ▪ Multimedia Project ▪ Trends
Computer Science* Select at least two of the following semester modules: ▪ Software Engineering ▪ Artificial Intelligence ▪ Computer Networks ▪ Programming Languages ▪ Compiler Construction ▪ Computer Security and Ethics ▪ Computer Graphics ▪ Database Systems	

* The semester in which the modules are offered may vary from year to year.

BIS (Information Science)

BIS (Information Science) is the ideal study programme for students who want to be part of the international information society, buy and sell information, develop information systems, and manage information products and services – also in cyberspace.

What does the study programme entail?

The increasing amount of information available and growing information needs have necessitated the training of information intermediaries to effectively facilitate the bringing together of users and the information they require. This study programme focuses on the use of information technology and the processing of information products, and is designed to train students in the management, retrieval and organisation of information, as well as to teach them to add value, package and distribute information. Students will also have the opportunity to develop knowledge and skills in the management of one of the most important resources of enterprises: information and knowledge.

School of Information Technology

Career opportunities

- information managers (manage information and knowledge resources)
- information specialists (organise, retrieve and add value to information)
- information consultants (consult on information products, services and systems)
- information brokers (act as an infopreneur and buy and sell information products and services)
- systems specialists (develop and analyse information systems)

How long does this study programme take to complete?

The BIS (Information Science) study programme takes a minimum of three years to complete.

Contact information

Prof Theo Bothma (Head of Department)
Tel +27 (0)12 420 2961
Fax +27 (0)12 362 5181
Email infosci@up.ac.za
Website http://is.up.ac.za

First year

First semester	Second semester
Fundamental modules ▪ Academic Information Management ▪ Academic Literacy Levels	**Fundamental modules** ▪ Academic Literacy Levels
Core modules Information Science ▪ Introduction to Information Science ▪ Personal Information Management Business Management	**Core modules** Information Science ▪ Organisation and Representation of Information ▪ Information and Communication Technology Business Management
Elective modules ▪ Group A: *Informatics or ▪ Group B: Any subject(s) at first-year level	**Elective modules** ▪ Group A: *Informatics or ▪ Group B: Any subject(s) at first-year level

Second year

First semester	Second semester
Fundamental module ▪ Community-based Project	**Fundamental module** ▪ Community-based Project
Core modules Information Science ▪ Information Seeking and Retrieval ▪ Social and Ethical Impact Business Management or Communication Management	**Core modules** Information Science ▪ Representation and Organisation Business Management or Communication Management
Elective modules ▪ Group A: *Informatics or ▪ Group B: Information Science	**Elective modules** ▪ Group A: *Informatics or ▪ Group B: Information Science

Third year

First semester	Second semester
Core modules Information Science ▪ Information Organisation ▪ Experimental Learning Project	**Core modules** Information Science ▪ Information and Knowledge Management ▪ Experimental Learning Project
Elective modules ▪ Group A: *Informatics and Business Management or Communication Management or ▪ Group B: Information Science or ▪ Group C: *Informatics and Information Science	**Elective modules** ▪ Group A: *Informatics and Business Management or Communication Management or ▪ Group B: Information Science or ▪ Group C: *Informatics and Information Science

* If Informatics is selected as a subject at first-year level, a minimum achievement level of 5 (60–69%) must be obtained for Mathematics.

I am a final-year postgraduate student completing my BISHons degree in Information Science. This degree enables one to develop the required skills and knowledge to manage vital resources in an organisation (information and knowledge). The EBIT Faculty's students and staff are highly creative and innovative, and it is great to be part of such a faculty. The knowledgeable lecturers make it easy to grasp complex concepts during lectures and consultations.

I am a member of the Golden Key International Honour Society and I am currently part of the CoachLab@Hub Skills and Leadership Development Programme. The skills and experience I am gaining are invaluable. I have been featured in an article in the third issue of the 2014 *DED Insight* newsletter on my experiences and plans for the future. My dream job is one where the environment promotes growth and learning.

Busisiwe Gwiji

School of Information Technology

BIS (Publishing)

This study programme focuses on the theory and practice of book and corporate publishing.

What does the study programme entail?

This study programme aims to do the following:

- Provide students with knowledge of the publishing process and key role-players, as well as trends and initiatives in the local and international publishing industry.
- Provide students with the skills needed to perform specific tasks related to the publishing process.
- Assist students in becoming responsible information intermediaries and in adding value to the production and dissemination of books and corporate publications.
- Make students aware of the social, ethical and legal responsibilities involved in the publishing process.

Career possibilities

A variety of career opportunities are available in the book publishing industry, the book retail industry and the corporate publishing environment. Motivated and goal-orientated candidates can become part of this highly competitive environment at entrance level. On-the-job experience will be needed for subsequent career development.

Some entrance-level career opportunities include the following:

- assisting specific role-players in the publishing value chain (for example, the managing director of a publishing house, commissioning editor, or the editorial, production or marketing manager)
- market or picture research
- copyright negotiations
- copy-editing and proofreading
- marketing and promotion
- distribution and delivery

These career opportunities are available at the following places:

- local and international book publishing houses
- bookshops and e-commerce, journals, newspapers, magazines
- the media and publicity industries
- national and local government departments
- the corporate and business environment
- civil society
- community-based publication initiatives
- self-publishing and consultancy

How long does this study programme take to complete?

The BIS (Publishing) takes a minimum of three years to complete.

Contact information

Prof Theo Bothma (Head of Department)
Tel +27 (0)12 420 2961
Fax +27 (0)12 362 5181
Email infosci@up.ac.za
Website http://is.up.ac.za

First year

First semester	Second semester
Fundamental modules ▪ Academic Information Management ▪ Academic Literacy Levels ▪ Visual Cultural Studies	**Fundamental modules** ▪ Academic Literacy Levels ▪ English for Specific Purposes
Core modules Information Science ▪ Introduction to Information Science ▪ Personal Information Management Marketing	**Core modules** Information Science ▪ Information and Communication Technology Publishing ▪ The Book Publishing Environment ▪ Visual Cultural Studies Marketing
Elective modules ▪ Select a modern language of your choice in consultation with the package organiser.	**Elective modules** ▪ Select a modern language of your choice in consultation with the package organiser.

Second year

First semester	Second semester
Fundamental module ▪ Community-based Project	**Fundamental module** ▪ Community-based Project
Core modules Information Science ▪ Social and Ethical Impact Publishing ▪ Copy-editing Type, image and applications	**Core modules** Publishing ▪ The Visual and Production Dimensions of Publishing Text Design
Elective modules ▪ Continue with the same language as selected previously and select modules in consultation with the package organiser.	**Elective modules** ▪ Continue with the same language as selected previously and select modules in consultation with the package organiser.

Third year

First semester	Second semester
Core modules Publishing ▪ Publishing in the Digital Environment ▪ Commissioning	**Core modules** Publishing ▪ Management in the Publishing Environment ▪ Publishing in the Magazine and Corporate Environment
Elective modules Continue with the same language as selected previously and select one semester module in consultation with the package organiser. It can be a first- or second-semester module.	

At the moment, I am completing my BISHons Publishing. I love the EBIT faculty, because I believe it has the widest variety of courses that encompass both creativity and scientific knowledge. The Department has expert lecturers who readily assist students with all sorts of questions.

Most of the valuable opportunities in my university career have come from doing things outside academics that augmented my studies. Working for the student newspaper, *Perdeby*, being a tutor and being on the executive committee of two organisations (the UP chapter of the Golden Key International Honour Society and TuksVillage Residence Management Committee) have allowed me to explore the differences between theoretical information and practical knowledge, collaborating with colleagues and, in essence, what it means to really work.

During my studies, I have been awarded prizes as the second-best second-year publishing student for 2012 and the second-best third-year student (2013). In 2013, I also received awards for the best third-year magazine project, the second-best third-year e-book project, and best layout artist for Perdeby. Furthermore, the Golden Key International Honour Society invited me to become a member.

The aspect of publishing that gets me excited is layout and design, so being involved in publications that give enough space for creative freedom is an ideal job for me. However, I have numerous roles that I would like to fill throughout my career, and one of them is to become the Head of Books and Publishing at the national Department of Arts and Culture.

Ditshego Madopi

General information

1. University of Pretoria campuses and contact information

Client Service Centre (CSC)

Tel +27 (0)12 420 3111
Email csc@up.ac.za
Website www.up.ac.za

Location

University of Pretoria, cnr Lynnwood Road and Roper Street, Hatfield, South Africa

Postal address

University of Pretoria, Private bag X20, Hatfield 0028, South Africa

GPS coordinates to campuses

Hatfield	S25˚45′ 21″ E28˚13′ 51″
GIBS	S26˚07′ 46.2″ E28˚02′ 46.788″ (56 km from Hatfield Campus)
Groenkloof	S25˚46′ 10″ E28˚12′ 34″ (3.5 km from Hatfield Campus)
UP Sports Campus	S25˚45′ 10″ E28˚14′ 46″ (1.2 km from Hatfield Campus)
Mamelodi	S25˚43′ 22″ E28˚23′ 56″ (12 km from Hatfield Campus)
Onderstepoort	S28˚10′ 54″ E25˚38′ 52″ (22 km from Hatfield Campus)
Prinshof	S25˚43′ 57″ E28˚12′ 10″ (6 km from Hatfield Campus)

2. Admission requirements

The statutory minimum requirements for degree studies is a National Senior Certificate (NSC), with a minimum achievement level of 4 (50%–59%) in four recognised NSC 20-credit subjects from the designated subject list below:

- Accounting
- Agricultural Science
- Business Studies
- Consumer Studies
- Dramatic Arts
- Economics
- Engineering Graphics and Design
- Geography
- History
- Information Technology
- Languages*
- Life Sciences
- Mathematical Literacy
- Mathematics
- Music
- Physical Science
- Religion Studies
- Visual Arts

*Based on the languages used as medium of instruction at the University of Pretoria, it is advisable that students should have English and/or Afrikaans as a Home Language or as a First Additional Language, together with any other language of choice. Faculties and/or certain study programmes may impose additional requirements.

Prospective students in Grade 12 (final school-year) must use their final Grade 11 year mark (promotion mark) to apply. No Grade 12 marks will be considered for provisional admission. Please note that prospective students who have already left school should use their NSC/IEB* Certificate to apply. Also refer to "Higher Education South Africa" on page XX. Additional selection criteria are applicable in applications for selection programmes.

Provisional admission is granted on the results obtained in the final Grade 11 examination (promotion mark). Please note that the final Grade 12 results remain the determining factor with regard to admission. Also note that compliance with the minimum requirements does not necessarily guarantee admission to any study programme.

The calculation of an Admission Point Score (APS) is based on a candidate's achievement in any SIX recognised NSC 20-credit subjects (including subjects from the non-designated subject list, eg CAT, Tourism, Hospitality Studies and Civil, Electrical & Mechanical Technology, etc), by using the NSC seven-point rating scale. Life Orientation is a 10-credit subject and may not be used for calculating the APS. Life Orientation is also not a faculty-specific subject requirement.

*Independent Examination Board (IEB)

National Senior Certificate (NSC) seven-point rating scale

Achievement level	Description	Percentage
7	Outstanding achievement	80–100%
6	Meritorious achievement	70–79%
5	Substantial achievement	60–69%
4	Adequate achievement	50–59%
3	Moderate achievement	40–49%
2	Elementary achievement	30–39%
1	Not achieved	0–29%

National Benchmark Test (NBT)

The NBT is not compulsory for all study programmes. Please refer to the relevant study programmes in this brochure. Please note that the Academic Literacy Test does not replace the NBT.

Contact information

Tel +27 (0)21 650 3523
Website www.nbt.ac.za

3. Application for admission

- Applications open on 1 March of the year preceding the year of study. Completed application forms must reach the CSC before the closing date.
- We recommend that you apply online at www.up.ac.za/apply. Once your application form has been processed, you will receive an eight-digit UP student number. You are also welcome to download an application form from the website.
- It is strongly recommended that you also indicate a second choice study programme on your application form. Refer to www.up.ac.za/admissioninfo. It is not advisable to apply for two selection programmes as your first and second choice. Selection programmes are study

General information

programmes with early closing dates and limited space and must preferably be indicated as first choice on your application form.
- A non-refundable application levy of R300 must accompany every application.
- The following documents must accompany your application:
  - A copy of your final Grade 11 examination report indicating your promotion mark
  - A copy of your ID or your birth certificate
- Faxed, scanned, or emailed application forms will not be accepted. Each student must complete only one application form.
- You may follow the progress of your application online via the UP Portal (Student Centre). Visit www.up.ac.za/portal.

4. Language policy and medium of instruction

In conducting its business, the University uses two official languages, namely English and Afrikaans. In formal education the medium of instruction is either English or Afrikaans, or both of these languages; provided that there is a demand and that it is academically and economically justifiable. However, it remains the student's responsibility to ascertain on an annual basis in which language a module and any further level of that module is presented. In respect of administrative and other services, a student has the right to choose whether the University should communicate with him or her in English or Afrikaans. Where the University has the capacity, Sepedi is used as an additional language of communication.

5. Bursaries, awards and loans (financial aid)

University-managed bursaries and loans

Apply between 1 August and 30 September of the year preceding studies at www.up.ac.za/feesfunding. Please note that applicants for sports bursaries, should also complete an application form, which can be obtained from the Sports Centre, sportsinfo@up.ac.za, +27 (0)12 420 6060 or www.up.ac.za/sport.

University-managed awards

Learners do not apply for these awards. They are awarded automatically after registration. For the specific criteria, please refer to www.up.ac.za/feesfunding.

Other financial aid options

- Edu-loan: www.eduloan.co.za
- The Bursary Register:
  Tel +27 (0)11 672 6559
  Email slevin@mnet.co.za
  www.gostudy.mobi
- www.bursary.hcifoundation.co.za

Achievement awards – new first-year students: 2015*

Guaranteed undergraduate achievement awards

Learners do not apply for the achievement awards below. These awards are awarded based on academic achievement.

Qualifying average percentage	Faculty of Natural and Agricultural Sciences Faculty of Engineering, Built Environment and Information Technology	Faculty of Health Sciences Faculty of Veterinary Science	Other faculties
75%–79.99%	R6 000	–	–
80%–89.99%	R15 000	R6 000	R15 000
90%–100%	R40 000	R20 000	R40 000

*Amounts will be adjusted for 2016.

Please note: The University of Pretoria reserves the right to amend award values without prior notice. Please refer to www.up.ac.za/feesfunding for the criteria applicable to the above achievement awards.

General information

6. Special offer to academic achievers

The special offer to academic achievers is based on average percentages obtained in the end examination of the final school year. This special offer may include guaranteed awards, placement in study programmes and/or residence placement. For more information on the University's special offer to new first-year students, visit www.up.ac.za/admissioninfo.

Guaranteed admission to a non-selection study programme of a student's first or second choice

Conditions
- Applications must be received on or before 1 May of the year preceding commencement of studies.
- The minimum requirements for admission to the chosen study programme must be met with the results achieved in the end examination of the final school-year.
- The minimum National Benchmark Test (NBT) requirements for the specific study programme must be met.

Please note that admission to selection study programmes cannot be guaranteed.

Placement in a residence of the University of Pretoria

75%–89.99%	90%–100%
Consideration for placement in a residence of the University of Pretoria rests upon the following: The prospective student must: ▪ apply before 1 May in the year preceding studies; ▪ have obtained an average of between 75% and 89.99% in the examination with which the student apply for admission to study at UP; and ▪ be provisionally admitted to a study programme. Please take note that the academic average percentage is based on a calculation formula of the University of Pretoria.	Guaranteed placement in a residence of the University of Pretoria rests upon the following: The prospective student must: ▪ apply before 1 May in the year preceding studies; ▪ have obtained a minimum average of 90% in the examination with which the student apply for admission to study at UP; and ▪ be provisionally admitted to a study programme. Please take note that the academic average percentage is based on a calculation formula of the University of Pretoria.

7. UP banking details

ABSA	Standard Bank
Branch: Hatfield	Branch: Hatfield
Branch code: 632005	Branch code: 011545
Account number: 214 000 0054	Account number: 012 602 604
Deposit Reference: Eight-digit student number	Deposit Reference: Eight-digit student number
For international transactions: **SWIFT CODE: ABSAZAJJCPT**	

Please note:
- Always quote your eight-digit UP student number when making payments.
- Allow at least five working days for processing by your bank and retain the proof of payment (deposit slip).
- Do not fax your deposit slip to UP, unless specifically requested to do so. Faxing the deposit slip to UP will NOT reduce processing time at the University and will NOT allow same day services, especially during registration.
- For the Absa online banking page, see www.up.ac.za for help on setting up first time online banking. Search with "UNI" as beneficiary and choose the "students" option. This will reflect UP's bank account number 214 000 0054 when making a payment and will allow you to use your student number as reference.

8. Accommodation

Only a limited number of places are available in the University's residences. Placement in residences is based on academic achievement (APS) in Grade 11 and the date of your application. Consequently, you are strongly advised to apply for placement in a residence in March of the year preceding your studies. Please note that the demand for residence accommodation exceeds the availability and admission to a study programme can thus not guarantee placement in a residence. Guaranteed placement in a residence only applies to students who meet the minimum requirements of the UP special offer to academic achievers.

Application for placement in a residence is made on the application form for a study programme. Placement in a residence then takes place AFTER a prospective student has been provisionally admitted to a study programme. A prescribed reservation fee for residence place, is payable once you have been notified in writing that you have been placed in

General information

a residence. Please visit www.up.ac.za/admissioninfo or www.up.ac.za/accommodation.

Private accommodation

The University can unfortunately not provide accommodation to all applicants as the demand exceeds the available places. For more information please refer to www.up.ac.za/accommodation.

9. Security services

The Department of Security Services creates and maintains a 24-hour safe environment, provides access control on all campuses as well as 24 hour surveillance by the UP Operational Management Centre.

Contact information

24 hour UP Operational Manager
+27 (0)83 654 0476
24 hour UP Operational Management Centre
+27 (0)12 420 2310/2760
24 hour crisis line
+27 (0)80 000 6428 (toll-free)

10. International students

All non-South African citizens must report to the International Students Division in the Client Service Centre on the Hatfield Campus prior to registration. Non-South African citizens will have to submit proof of legal status in South Africa, as well as proof of adequate medical aid cover at the International Students Division in the Client Service Centre before they will be able to register.

Contact information

Tel +27 (0)12 420 3111
Email csc@up.ac.za
Website www.up.ac.za/ISD
Location Client Service Centre
Hatfield Campus

Supporting documents

All non-South African citizens will have to show their original documents and submit two photocopies of each of the documents listed below:

- The International Students Information form, completed and signed
- A valid passport or an ID (in the case of students with permanent residence in South Africa)
- A valid study permit endorsed for studies at the University of Pretoria or one of the following:
  - A study visa
  - An asylum-seekers transit visa
  - Refugee – Section 24 permit
  - A diplomatic visa
- Proof of medical aid cover (medical aid cover must be paid a year in advance, from January to December)

The above-mentioned documents must be submitted to an international consultant and the information must be captured before you can register.

Medical aid cover for study permit-holders

Non-South African citizens who are holders of study permits, or who wish to apply for a study permit must, in terms of South Africa's Immigration Act, have sufficient medical aid cover for the duration of their stay in South Africa. Non-South African citizens intending to study at the University of Pretoria can join one of the following medical aid schemes:

Momentum Health (Ingwe option)
Membership fees are payable in advance annually.
Tel +27 (0)12 671 8749 (Centurion office) or
+27 (0)86 010 2493
Email studenthealth@momentum.co.za
Website www.ingwehealth.co.za

BestMed Medical Scheme (Blueprint student option)
Membership fees are payable in advance annually.
Tel +27 (0)12 339 9800 or
+27 (0)86 000 2378 or
+27 (0)86 000 BEST
Fax +27 (0)12 323 4106 or
+27 (0)12 339 9900
Email lineyl@curemed.co.za

Higher Education South Africa (HESA)

A full or foreign conditional exemption certificate is a prerequisite and applicable to non-South African citizens and to students who do not have a South African National Senior Certificate (NSC) qualification or Independent Examination Board (IEB) qualification and who want to enrol for undergraduate studies at the University of Pretoria. This certificate can only be obtained from HESA.

Contact information

Tel +27 (0)12 481 2821
Fax +27 (0)12 481 2843/50
Email info@hesa.org.za
Website www.hesa.org.za
Location Unisa Sunnyside Campus
Building 3 Level 1
Cnr Rissik and Steve Biko Street
Sunnyside
Pretoria

General information

Admission Point Score (APS) conversion

The following tables can be used to convert your marks/symbols into an Admission Point Score (APS) when applying for studies at the University of Pretoria (UP).

Admission Point Score (APS) Conversion Table

APS (requirement level for subjects as well as overall APS)	NSC/IEB	SC HG M-score	SC SG M-score	HIGCSE NSSC HL	AS-Level	IB SL	IGCSE/ GCSE/ NSSC OL/ O-Level Grade 11*	IGCSE/ GCSE/ NSSC OL/ O-Level Grade 12**
7	7 (80–100%)	A		1	A	7	A	
6	6 (70–79%)	B	A	2	B	6	B	
5	5 (60–69%)	C	B	3	C	5	C	A
4	4 (50–59%)	D	C	3	D	4	C	B
3	3 (40–49%)	E	D	4	E	3	D	C
2	2 (30–39%)	F	E			2	E	D/E
1	1 (0–29%)	G	F			1	F	F/G

* APS conversion for Grade 11 equivalent qualifications only and for conditional admission and selection purposes

** APS conversion for Grade 12 equivalent qualifications – not for final admission and must be taken together with Advanced Subsidiary Level and Advanced Level for exemption purposes

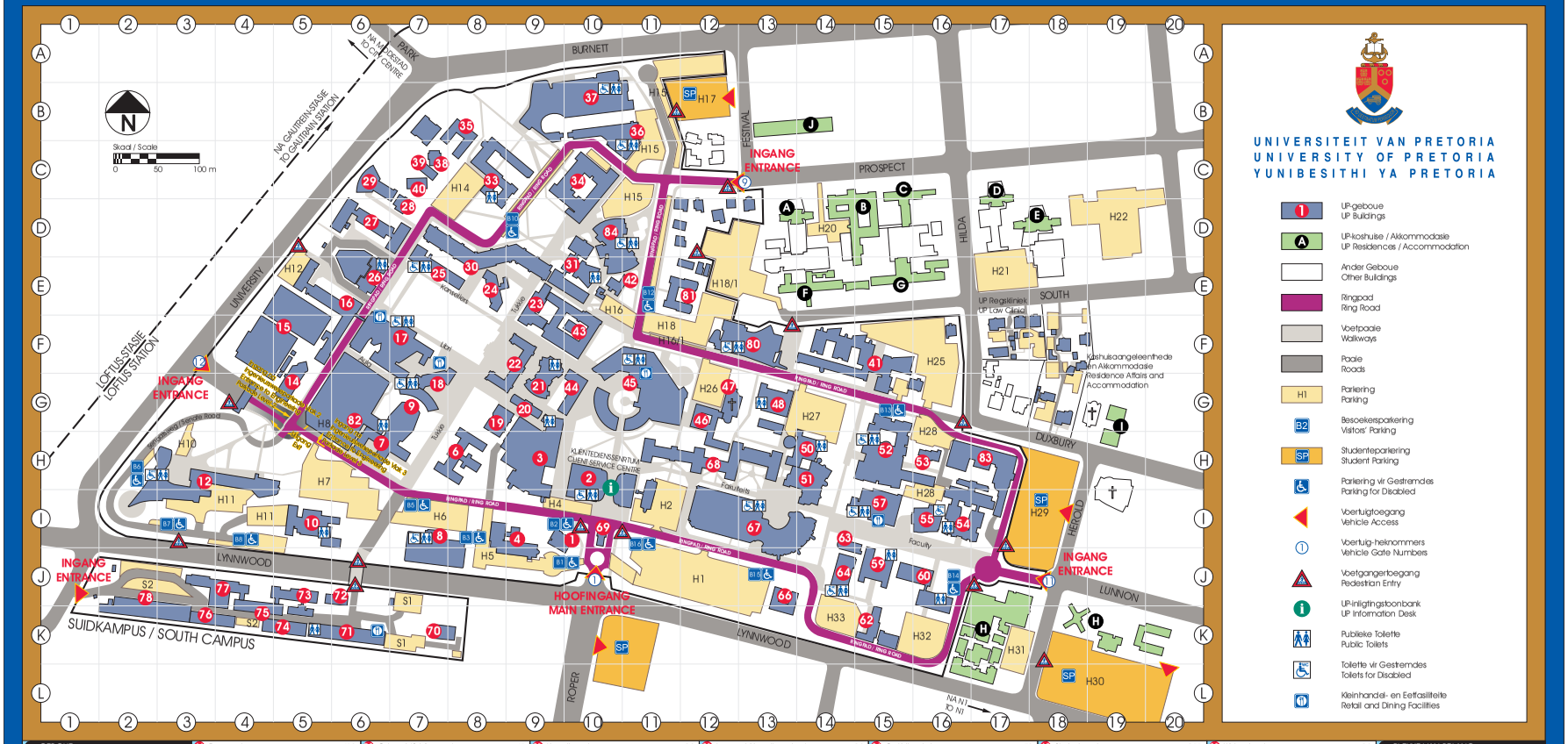
Admission Point Score (APS) Conversion Table only for Cambridge Advanced Level and IB Higher Level

APS		A-Level	IB HL
Required level for subjects	Required level for overall APS		
7	10	A	7
6	8	B	6
5	7	C	5
4	6	D	4
3	5	E	
2	4		
1	3		

NSC National Senior Certificate (completed Grade 12 in and after 2008)
IEB Independent Examination Board
SC HG Senior Certificate Higher Grade (completed Grade 12 before 2008)
SC SG Senior Certificate Standard Grade (completed Grade 12 before 2008)
HIGCSE Higher International General Certificate of Secondary Education
A-Level Advanced Level
AS-Level Advanced Subsidiary Level
IB International Baccalaureate Schools (Higher Levels and Standard Levels)
IGCSE International General Certificate of Secondary Education
GCSE General Certificate of Secondary Education
NSSC Namibia Senior Secondary Certificate
O-Level Ordinary Level

Hatfield Campus map

Hatfieldkampus / Hatfield Campus / Khamphase ya Hatfield S 25° 45' 21" E 28° 13' 51"



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

- UP-geboue / UP Buildings
- UP-koshuise / Akkommodasie / UP Residences / Accommodation
- Ander Geboue / Other Buildings
- Ringpad / Ring Road
- Voetpaaie / Walkways
- Paaie / Roads
- Parkering / Parking
- Besoekersparkering / Visitors' Parking
- Studenteparkering / Student Parking
- Parkering vir Gestremdes / Parking for Disabled
- Voertuigtoegang / Vehicle Access
- Voertuig-heknommers / Vehicle Gate Numbers
- Voetgangerbeegang / Pedestrian Entry
- UP-inligtingstoonbank / UP Information Desk
- Publieke Toilette / Public Toilets
- Toilette vir Gestremdes / Toilets for Disabled
- Kleinhandel- en Eetfasiliteite / Retail and Dining Facilities

GEBOUE		DUILDINGS		GEBOUE		BUILDINGS		GEBOUE		BUILDINGS		GEBOUE		BUILDINGS		GEBOUE		BUILDINGS	
12	Administrasiegebou	H3	Administration Building	H3	66	Dramagebou	J13	Drama Building	J13	78	Gebou 6 (Suidkampus)	J5	Building 6 (South Campus)	J5	21	Kanseliersgebou	G9	Council Building	G9	20	Ou Kollegehuis	E8	Old College House	E8
29	AE du Toit-ouditorium en -annekse	C6	AE du Toit Auditorium and Annexe	C6	53	Duxburyweg 67	H16	Duxbury Road 67	H16	73	Gebou 7 (Suidkampus)	K6	Building 7 (South Campus)	K6	17	Kapel	G12	Chapel	G12	30	Ou Landbougebou	C10	Old Agriculture Building	C10
56	Eeufeesgebou	F13	Centenary Building	F13	72	Gebou 8 (Suidkampus)	J6	Building 8 (South Campus)	J6	1	Klientediensentrum (KDS)	H10	Client Service Centre (CSC)	H10	4	Kommunikasiepatologiegebou	J9	Communication Pathology Building	J9	32	Ou Letteregebou	F5	Old Arts Building	F9
68	Ekonomiese en Bestuurswetenskappegebou	H12	Economic and Management Sciences Building	H12	70	Gebou 9 (Suidkampus)	K7	Building 9 (South Campus)	K7	10	Klubsaalgebou	H10	Club Hall	G7	50	Konferensiesentrum	H14	Conference Centre	H14	31	Ou Merenskyblokteek	G8	Old Merensky Library	G8
54	FABI 1	I16	FABI 1	I16	52	Geografiegebou	E9	Geography Building	E9	23	Koöperasiegebou	G7	Co-operative Building	G7	60	Landbou-annekse	J15	Agriculture Annexe	J15	41	Regsgeleerdheidgebou	F15	Law Building	F15
59	FABI 2	I16	FABI 2	I16	57	Huis en Haard	I15	Home and Hearth	I15	7	Musiekgebou	H6	Musician and Amphitheatre	H6	66	Landbou-gebou	J16	Agricultural Sciences Building	J16	63	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9
76	Gebou 1 (Suidkampus)	J2	Building 1 (South Campus)	J2	1	Kya Rosa	I10	Kya Rosa	I10	9	Nagraadse Sentrum	H15	Postgraduate Centre	H15	67	Natuurwetenskappe 1-gebou	E8	Natural Sciences Building 1	E8	43	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9
77	Gebou 2 (Suidkampus)	J4	Building 2 (South Campus)	J4	16	Ingenieurswese 1-gebou	E6	Engineering 1 Building	E6	51	Natuurwetenskappe 2-gebou	E7	Natural Sciences Building 2	E7	61	Noordsaal (Chemiegebou)	E10	Northern Council Chamber	E10	46	Stoneman-gebou	C7	Stoneman Building	C7
75	Gebou 3 (Suidkampus)	K3	Building 3 (South Campus)	K3	62	Ingenieurswese 2-gebou	E6	Engineering 2 Building	E6	58	Ou Chemiegebou	G10	Old Chemistry Building	G10	42	Studentegesondheidsentrum	E11	Student Health Services	E11	37	Vetmangebou	C7	Vetman Building	C7
74	Gebou 5 (Suidkampus)	K5	Building 5 (South Campus)	K5	60	Landbouwetenskappegebou	J16	Agricultural Sciences Building	J16	65	Studentesentrum	G11	Student Centre Building	G11	10	Visuelekunste-gebou	I5	Visual Arts Building	I5
78	Gebou 4 (Suidkampus)	K4	Building 4 (South Campus)	K4	69	Lieteater	K15	Lie Theatre	K15	55	Suidsaal (Chemiegebou)	E10	Southern Council Chamber	E10	35	Wiskundegebou	C8	Mathematics Building	C8
71	Gebou 6 (Suidkampus)	J5	Building 6 (South Campus)	J5	2	Klientediensentrum (KDS)	H10	Client Service Centre (CSC)	H10	36	FABI 2	I16	Physics Building	I16	24	Ou Landbougebou	C10	Old Agriculture Building	C10	44	Swaarmasjienlaboratorium	F5	Heavy Machinery Laboratories	F5
70	Gebou 9 (Suidkampus)	K7	Building 9 (South Campus)	K7	3	Klubsaalgebou	H10	Club Hall	G7	39	Geografie	E9	Geography Building	E9	25	Ou Letteregebou	F9	Old Arts Building	F9	45	Tegniesediens-gebou	B10	Technical Services Building	B10
	Besoekersentrum		Visitors' Centre		4	Kommunikasiepatologiegebou	J9	Communication Pathology Building	J9	40	Meraka Institute	H15	Meraka Institute	H15	26	Ou Merenskyblokteek	G8	Old Merensky Library	G8	47	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		5	Musiekgebou	H6	Musician and Amphitheatre	H6	34	Meteorologie	H15	Meteorology	H15	27	Plantkundegebou	B8	Plant Sciences Building	B8	48	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		6	Nagraadse Sentrum	H15	Postgraduate Centre	H15	38	Natuurwetenskappe 1-gebou	E8	Natural Sciences Building 1	E8	28	Plantwetenskappe-komplekss	H17	Plant Sciences Complex	H17	49	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		8	Natuurwetenskappe 1-gebou	E8	Natural Sciences Building 1	E8	33	Natuurwetenskappe 2-gebou	E7	Natural Sciences Building 2	E7	64	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	52	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		11	Noordsaal (Chemiegebou)	E10	Northern Council Chamber	E10	81	Ou Chemiegebou	G10	Old Chemistry Building	G10	29	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	53	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		12	Ou Chemiegebou	G10	Old Chemistry Building	G10	42	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	31	Sanlam-ouditorium (Lesingsale E&BW)	H14	Sanlam Auditorium (Lecture Halls E&MS)	H14	54	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		13	Ou Kollegehuis	E8	Old College House	E8	43	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	22	Suidsaal (Chemiegebou)	E10	Southern Council Chamber	E10	55	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		14	Ou Landbougebou	C10	Old Agriculture Building	C10	44	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	19	Swaarmasjienlaboratorium	F5	Heavy Machinery Laboratories	F5	56	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		15	Ou Letteregebou	F5	Old Arts Building	F9	45	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	18	Tegniesediens-gebou	B10	Technical Services Building	B10	57	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		18	Ou Merenskyblokteek	G8	Old Merensky Library	G8	46	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	14	Tydskrifgebou	B8	Journal Building	B8	58	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		19	Ou Merenskyblokteek	G8	Old Merensky Library	G8	47	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	15	Tydskrifgebou	B8	Journal Building	B8	59	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		22	Plantkundegebou	B8	Plant Sciences Building	B8	48	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	16	Tydskrifgebou	B8	Journal Building	B8	60	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		23	Plantwetenskappe-komplekss	H17	Plant Sciences Complex	H17	49	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	17	Tydskrifgebou	B8	Journal Building	B8	61	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		26	Regsgeleerdheidgebou	F15	Law Building	F15	50	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	62	Tydskrifgebou	B8	Journal Building	B8	63	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		27	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	51	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	63	Tydskrifgebou	B8	Journal Building	B8	64	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		28	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	52	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	64	Tydskrifgebou	B8	Journal Building	B8	65	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		29	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	53	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	65	Tydskrifgebou	B8	Journal Building	B8	66	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		30	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	54	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	66	Tydskrifgebou	B8	Journal Building	B8	67	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		31	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	55	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	67	Tydskrifgebou	B8	Journal Building	B8	68	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		32	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	56	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	68	Tydskrifgebou	B8	Journal Building	B8	69	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		33	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	57	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	69	Tydskrifgebou	B8	Journal Building	B8	70	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		34	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	58	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	70	Tydskrifgebou	B8	Journal Building	B8	71	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		35	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	59	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	71	Tydskrifgebou	B8	Journal Building	B8	72	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		36	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	60	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	72	Tydskrifgebou	B8	Journal Building	B8	73	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		37	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	61	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	73	Tydskrifgebou	B8	Journal Building	B8	74	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		38	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	62	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	74	Tydskrifgebou	B8	Journal Building	B8	75	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		39	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	63	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	75	Tydskrifgebou	B8	Journal Building	B8	76	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		40	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	64	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	76	Tydskrifgebou	B8	Journal Building	B8	77	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		41	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	65	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	77	Tydskrifgebou	B8	Journal Building	B8	78	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		42	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	66	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	78	Tydskrifgebou	B8	Journal Building	B8	79	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		43	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	67	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	79	Tydskrifgebou	B8	Journal Building	B8	80	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		44	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	68	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	80	Tydskrifgebou	B8	Journal Building	B8	81	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		45	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	69	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	81	Tydskrifgebou	B8	Journal Building	B8	82	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		46	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	70	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	82	Tydskrifgebou	B8	Journal Building	B8	83	Tydskrifgebou	B8	Journal Building	B8
	Kaartjieskantoor		Ticket Office		47	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	71	Rooisaal (Kanseliersgebou)	G9	Council Chamber	G9	83	Tydskrifgebou	B8	Journal Building	B8	84	Tydskrifgebou	B8	Journal Building	B8

KOSHUISE / AKKOMMODASIE		RESIDENCES / ACCOMMODATION	
A	Erika	D13	Erika
B	Vergeet-my-nie	D15	Te Water Hall (Chancellor's Building)
C	Astethof	C15	Theology Building
D	Madeliefie	D18	Madeliefie
E	Magrietjie	D18	Kya Rosa
F	Klaradyn	E14	Mapungubwe Collection
G	Jasmyn	E15	Sci-Enza Centre
H	Nerina	K17	Van Tilburg Collection
I	Protea	G19	
J	Jakaranda	B14	

PLEKKE VAN BELANG		PLACES OF INTEREST	
35	Botaniese Tuin	B8	Botanical Garden
36	Camera Obscura	E8	Camera Obscura
37	Chapel	G12	Chapel
39	Eduardo Villa-museum	G8	Eduardo Villa Museum
22	Geologiemuseum	D6	Geology Museum
17	Kapel	G12	
1	Kya Rosa	I10	
22	Mapungubwe-versameling	F9	
36	Sci-Enza-sentrum	B11	
22	Van Tilburg-versameling	F9	

UP-NOODNOMMER:
012 420 2310

UP EMERGENCY NUMBER:
012 420 2310

Kaart soos bygewerk in September 2013

Vrywaring: Alhoewel elke moontlike poging aangewend is om te verseker dat dit wat op hierdie kaart verskyn die jongste akkurate inligting is, moet gebruikers nie aanvaar dat dit altyd die geval is nie. Die Universiteit van Pretoria gee nie voor, of waarborg nie uitdruklik of by implikasie, dat al die inligting op die kaart akkuraat is nie. Die Universiteit van Pretoria, sy werknemers, amptenare, verskaffers, agente en/of verteenwoordigers kan nie aanspreeklik gehou word vir enige verlies of skade wat deur die gebruiker gely word, ongeag daarvan of dit direk, indirek of daaruit voortvloeiend is, of vir enige uitgawes van enige aard wat regstreeks of onregstreeks voortspruit uit die feit dat die gebruiker op die kaart staatgemaak het nie.

Map updated September 2013

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University of Pretoria
cnr Lynnwood Road and Roper Street
Hatfield
South Africa
Tel +27 (0)12 420 3111 Fax +27 (0)12 420 4555